London International Conference on Education (LICE-2016)
November 14-17, 2016, London, UK

Proceedings
Message from the Steering Committee Chair

Welcome to the London International Conference on Education (LICE-2016). The LICE-2016 provides opportunity for academicians and professionals to bridge the knowledge gap and to promote research esteem.

The LICE-2016 received 2646 papers from 92 countries of which 322 papers were accepted after the first review and 116 papers (abstracts 21, extended abstracts 26, full papers 69) were finally accepted for presentation. We received 43 Posters and 9 were accepted, 5 workshops were accepted out 26 and 4 Speaker Proposals were accepted out of 31. The double blind paper review method was adopted in LICE-2016 to evaluate each of the conferences submissions. Please note that selected papers will be invited for publications in high impact International Journals.

Many people have worked very hard to make this conference possible. We would like to thank all who have helped in making LICE-2016 a success. The Steering Committee and reviewers each deserve credit for their excellent job. We thank the authors who have contributed to each of the conferences and all our Keynote Speakers: Professor Jim Nyland, Professor Michael Shevlin, Dr Kelly La Venture, for agreeing to participate in LICE-2016. We will also like to acknowledge our appreciation to the following organisations for their sponsorship and support: Infonomics Society and Canadian Teacher Magazine. The long term goal of LICE-2016 is to build a reputation and respectable conference for the international community.

On behalf of the LICE-2016 Executive members, we would like to encourage you to contribute to the future of LICE-2016 as authors, speakers, panellists, and volunteer conference organisers. We wish you a pleasant stay in London, and please feel free to exchange ideas with other colleagues.

Professor Charles A. Shoniregun  
LICE-2016 Steering Committee Chair  
Infonomics Society, UK and Ireland
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Keynote Speakers
LICE Keynote Speaker 1

Professor Jim Nyland took up the role of Associate Vice-Chancellor (Brisbane) at the Australian Catholic University (ACU) in October 2011. Previously, he has held academic appointments at the University of Queensland, where he was the Director of Corporate Education and Director of UQ Business School Downtown. Prior to this he was Manager of the Vice-Chancellor’s Office for Community Partnerships at Griffith University and Assistant Director of the School of Buxton at the University of Derby. Professor Nyland holds a Doctorate in Education from the University of Derby and has published widely in the areas of innovation, learning and engagement in higher education.

Title: Dickens is timeless

Abstract: Charles Dicken’s novel *Hard Times - in these Times* was published more than 150 years ago highlighting the social and economic pressures of the time brought about by a cocktail of rampant materialism and dire industry practices. If democracy was assumed to correct this imbalance then recent examples of Corbyn, Hansen, BRexit and potentially Trump, remind us that new social and economic forms are emerging world-wide with little concern for the traditional communities they seek to disrupt and leave without supports. Universities are not immune to the contagion of merciless democratic judgements (by discerning students who vote with their feet) and they will need to demonstrate relevance in new and different ways if they are to figure as key elements in the solutions; and their critical and defining role, that of promoting and fostering learning, must be re-invented for a new generation.

But what does an engaged university do? It must sort out the money issues and secure income which protects the key academic missions and portfolios. It must devise an attractive and relevant curriculum and learning environment and contribute to research. The university must help its community to define itself and be part of it as a key focus for engagement. The campus must be a good place to work for students and staff and the institution should be environmentally and ethically sensitive and responsible. Nationally and internationally the university must preserve its reputation so that good staff and students are recruited and retained. A university’s mission must play its part in improving the environment, local education and health and community outcomes. For this to happen learning must be credible; it must be really useful knowledge for those who are bent on acquiring it. In this context we must remember that millions of people across the globe have absolutely no access to university accredited learning and unless their poverty and geographical isolation is substantially relieved they will remain outside our western system of mass higher education. These are the ‘housekeeping’ issues and important though they are, there are issues of principle which need to be addressed at the same moment! It may be time for universities to take the side of and be in solidarity with collective identities and communities which are in struggle for a fairer society. Stability and social cohesion, let alone morality, prosperity and sense of the ‘fair go’ demands that this issue be
addressed. If universities are to help shape the ‘new times’, we need to re-define and re-shape our communities.

First, because community is problematic John Berger, the great art and social critic, said that we don’t just live our own lives but the longings of our century. This means we have a longing to belong; a longing for community; a desire to be a part of something greater than just ourselves and our own family, important though that might be. The communities left behind by de-industrialisation and those who have only known poverty and deprivation and war are seeking meaning in their past and a viable future. Productivity is not reducing scarcity and the knowledge explosion is not leading to greater democracy. The economic and military unification of the world has not brought peace but genocide

Second, modern life is impermanent and unstable yet communities want to have a common identity and they seek shared experience. We live inter-dependent lives and have a shared fate in common. We need imaginative solutions to issues and problems facing us. We live in ‘new times’ and in a state of permanent transition and this forces us to look at the direction of change; where is it going? How will it get there? The rise of populism seems to point to the failure of globalisation and ‘neo-liberalism’ with its emphasis on the ‘small state’, the marketization of all goods and services and social life, the privatisation of all social wealth and communal resources. The status quo is not sustainable and people are becoming concerned about what binds a society and community together. The older ‘central’ politics is being rejected in favour of more radical proposals, from both right and left directions in Europe, in the USA and in Australia. They seem to offer attractively simple answers to the intractable problems of economic and cultural grievances and the bonds that held us together in the past seem to weaken as identity politics and nationalism gain ground.

Universities cannot be neutral ground in these struggles. The remaking of economy and community is a task for us as we face a 21st Century Dickensian call for hard choices in new times. This paper explores whether or not universities can be marginal in this or whether they can generate new debate and momentum about their own relevance and role in engaging and helping transform the communities they serve and of which are an intrinsically significant part
Michael Shevlin is Professor in Inclusive Education, Trinity College Dublin since 1996. His teaching and research has focused on facilitating the inclusion of children and young people with special educational needs within mainstream schools, promoting the voice of marginalised people within decision making processes that affect their lives, and addressing access issues for young people with disabilities within compulsory and higher education. He, along with a number of colleagues, have completed a number of national studies including Study of Special Classes in mainstream schools (in association with ESRI team), Quali-TYDES project longitudinal study of lives of young people with disabilities (European Social Fund), Transition Experiences of Students with Disabilities into Further and Higher Education, and Project IRIS longitudinal study of special education in Ireland. Michael has been involved in a number of policy making initiatives within Irish education in relation to the development of inclusive learning environments in schools and higher education.

**Title:** Educational inclusion for children and young people with special educational needs: Is it a case of so far and no further?

**Abstract:** There appears to be a well-established consensus that educational inclusion is a ‘good’ that should be achieved within our educational systems. Ground breaking international conventions, national policy and legislation all articulate the value of educational inclusion for children and young people from traditionally marginalised communities, in particular, those students who have special educational needs. Students with special educational needs are increasingly supported within mainstream education with dedicated teaching and support personnel, adapted curricula and reasonable accommodations. Despite this progress serious questions and challenges remain. Some researchers (Minow, 1991, Norwich, 2009) have conceptualised these challenges as the dilemma of difference. Within this address, I would like to explore in greater depth what these dilemmas of difference look like in practice and suggest that in many instances these dilemmas are not confined to establishing inclusive learning environments but rather concern fundamental struggles with difference within society.
Dr Kelly La Venture is the Director of Marketing Assistance and Research Solutions in the Department of Business Administration, College of Business, Technology and Communication at Bemidji State University, Bemidji, Minnesota, USA. Dr La Venture teaches courses in research, management and marketing. Dr La Venture graduated from the University of St. Thomas, Minneapolis, USA (Doctoral Program in Organization Learning and Development). Her Doctoral research investigated the proposition that application of learned skills and concepts of (1) critical reflection of self-behavior, (2) identification of values or assumptions underlying the behavior, (3) changes in underlying values or assumptions, and (4) changes in the behavior, fosters double-loop learning. Dr La Venture has presented research on Double-Loop Learning at the Organization Development Network (ODN) Conference, and Socio-Economic Approach to Management (SEAM) at the Ireland International Conference on Education (IICE) in Dublin, Ireland. Dr La Venture conducts research and consults with organizations in the private and nonprofit sectors. She finds the most satisfying work is helping organizations cultivate healthy and people-focused environments.

**Title:** The Human Factor to Profitability: How People-Centered Cultures Fosters Long-Term Organizational Success

**Abstract:** Human factor is central to organization survival and profitability. In this presentation, Dr. La Venture articulates how people-centered cultures foster employee engagement that in turn leads to long-term organizational success.
Workshops
Workshop 1: Youth-at-Risk to Kids at Hope: A Paradigm Shift and Model

The Kids at Hope (KAH) workshop will be an informative, research-based delivery as well as a hands-on delivery to help the attendees understand and embrace the concept of KAH. The hands-on delivery will be based on salient components of KAH's Module 1: "Unleashing the Power of Kids at Hope." Attendees will also learn about the successes of actual schools and/or youth organizations in the United States that practice KAH. After completing this workshop, attendees will be able to:

• Generate a logical argument on why some children succeed and others fail.
• Define Kids at Hope.
• Examine and synthesize the research that supports the Kids at Hope framework.
• Differentiate the concepts of culture vs. bureaucracy as it relates to Kids at Hope.
• Summarize the three universal truths and top five practices that build the foundation of Kids at Hope.
• Define and embrace culture of success for all children to succeed.
• Apply concepts of KAH in their own professional/educational settings.

The goal of this workshop is to help teachers with ideas to help all students learn math and be successful in the process. The presenters will try to make this old saying a true prediction for the future of your mathematics classroom, "I hear and I forget; I see and I remember; I do and I understand."

Organiser: Linda B. Pincham
Roosevelt University, USA
Workshop 2: New and Emerging Issues in Global Education

The objective of the workshop is to bring together researchers who are at the forefront of new trends in education including innovative curriculum development, Education for social justice, and emergency management with a view to meeting the diverse needs of learners, their wellbeing and that of those in educational leadership. The objectives are to:

a) provide a forum for sharing personal research or works in progress around emerging issues and discuss possible methodologies which could be used in various scenarios;

b) develop a collaborative network for those who work in the areas of social justice/human rights in education and meeting the needs of diverse populations in challenging situations.

Organiser: Barbara Perry
Otago Polytechnic, Dunedin, New Zealand
Workshop 3: Leading Your Classroom through the World of Technology

This workshop is designed to introduce a different angle in using LMS (Learning Management System). Attendees will have the chance to reconsider and drill new ideas to:

1. Have the ability to create online course as an electronic version of the course taught.
2. Have the ability to share and explore other ESL instructors’ experiences with LMS around the world.
3. Engage students to the course (ESL students).
4. Look for new innovative ways to use LMS in teaching and learning English as a Second Language.
5. Take advantage of using mobile devices in education and have them as an interactive tool.
6. Encourage students with self-conscious to have a voice in class by giving tasks that leads to collaboration via LMS.
7. Use supplementary audio/video files through LMS that can help an ESL instructor clarify a specific language skill.
8. Show how LMS can be a time saver to a teacher year after year.

Organiser: Nouf H. Al Behairi
Kuwait University, Kuwait

All information covered in this workshop will be directly related to the distinct population of students aged 16 to 24. These particular students have been dubbed Opportunity Youth, Disconnected Youth, Drop-Outs, Undocumented Minors, and DREAMers. Within traditional education, these students have been tracked, marginalized, and forgotten. With both quantitative and qualitative evidence, presenters will provide the landscape of a school in Washington, DC which seeks to educate and empower this exact population. Attendees should bring research on experience with these students, or a curiosity about their academic development.

Objectives:

- Attendees will review and interact with best practices for engagement, education, and retention of this population.
- Attendees will discover international similarities within this demographic.
- Attendees will offer research based solutions and ideas to improve and innovate academic services provided to these students.

Organisers: Angela B. Stepancic and Jerri L. Fuller
LAYC Career Academy, USA

In this workshop, we will discuss the changing demographics, the paradigm shifts in pedagogy and curricula, advances in academic technology, globalization, generational diversity, longevity of greying faculty in the academe, capability, accountability, and probability for higher education in the future decade. Additionally, we will list the future predictions in higher education in the immediate decade ahead in order to enhance the future of teaching and learning for students and faculty at various universities across the United States of America.

Participants will be able to:
1. List the challenges and trends in higher education.
2. Explain the changing demographics affecting higher education.
3. Identify the changing needs of students and highlight a systemic plan for college students.
4. Develop new course syllabi for their perspective program that infuses global, cultural dimensions into existing courses for 21st century learners in order to meet the changing demands.
5. Outline a framework of 21st century skills and competencies for students.

Organisers: Stephen Enwefa, M. Christopher Brown, Regina Enwefa, Damien Ejigiri
Southern University and A & M College, USA

Stephen Enwefa, M. Christopher Brown, Regina Enwefa, Damien Ejigiri
International Education Southern University and A & M College USA

Abstract

Higher education has gone through a plethora of constant changes globally over the last five to ten years. The forces of change in higher educational systems are found to be diverse, and significant. The twenty-first century is now a decade old, and higher education is facing turmoil that is destined to affect pedagogy, teaching and learning, content delivery method, tenure, and promotion over the coming years. In this era a belt-tightening effect is necessary in every sector of higher education. Many of the challenges and trends faced involves an ever evolving closed door of opportunity for educational systems where the trends will limit as to how far we go and exactly what and how we become in the future. This study focused on the changing demographics, the paradigm shifts in pedagogy and curricula, generational diversity, globalization, and probability for higher education in the future decade.

1. Introduction

There appears to be a trend as to how far we can go and how far we become in higher education as the doors of opportunity glide within the academe in years to come. In higher education institutions are faced with serious deficits and budget cuts that are now compelling them to decide whether to sink or swim through all of the economic hurdles that are affecting our society. The promise for future existence does not look too great if we do not face the challenges and issues coming from different angles. Higher education is faced with a deficit that is unprecedented in regards to economic woes, and those woes lead us to challenges in learning and opportunity for our students. There are still many students across the globe who have not had the opportunity to benefit from higher education. The question is how can those students be reached? After the institutions are able to recruit the caliber of students, how are the students engaged? How are they kept focused into prospective future jobs? Higher education has gone through tremendous changes and disruptions due to the economy. The educational system has recently moved towards Massive Open Online Courses (MOOCs) in a way to reduce the amount of money students have to pay for books and other technologies for their educational success. The New York Times acknowledged 2012 to be the year of the MOOC for academe.

The MOOCs are not as popular as they once were years ago; what was expected to happen in the academy has been far different that what was projected. Instead, MOOCs has been able to move the academe to better review their process for teaching and learning, and best pedagogical practices. This concept caused programs to consider teaching in ways that was never thought of before now. The process of teaching and reaching students has simply lead to a flipped classroom model approach that is challenging to faculty members but the outcome leads to improvements with the engagement of students and feedback that allows for opportunity to assess what is working and what is not working in their courses. This was done way before the great recession that took place in America [17]. There are many new untouched territories that have been unmarked with new products which are constantly moving up the market for institutions of learning to consider. Educational institutions are usually the last governmental sector to be disrupted and/or displaced due to reputable opponents.

The goal for education was previously for all citizens to become educated, and to go out there to change the world and make a difference. In contrast, the objective has undergone a paradigm shift. The society now trained students to become better prepared to make sure that learning takes place over a lifetime. Changes in the educational model of how to teach students requires variety of strategies and techniques for academic success for students. The driving force compels institutions to look through a new lens of hope, transformation and improvements for the 21st century. Every state has the essential financing for educational and public institutions success and function within communities. However, in spite of all of this, academe is still under a tremendous amount of stress as never before. The demographical data is startling as to how will we make the change? Demographical data will continue to be a driving force for educational reform and strategic development in the coming years that is neither simple nor straight forward. This is the reason why more persons are attending colleges and universities in this century. The capacity to adapt to this demand is still undeveloped but it is promising.
Most of all, it appears to be built from a global perspective. With all of these changes, there will be a period in which we can learn from the experiences of others. While higher education has gone global, the public and private school enrollment at the primary and secondary levels have seen an increase of 5 percent from 1997 to 2011 [1]. Projections are indicating an increase to approximately 6 percent within the next decade. By 2022 school enrollment is expected to be higher than 2011 while the private school sector will experience a decrease lower than normal average. These data suggest not only shifts in enrollment but also cultural and diverse changes for all races. African Americans, Hispanics, Asians/Pacific Islanders are projected to be higher than the Caucasians and American Indians/Alaska Natives [1]. Additionally, what is most interesting are the projections for the younger population that is anticipated to increase in growth. See Figure 1 for projected population enrollments from 1997-2022. [2] has anticipated a total enrollment in degree granting institutions to surge by 15 percent [2].

![Figure 1. The projected enrollment from 1997-2022 in higher education](image)

### 2. Demographic Trends

Changes are coming more rapidly than what was expected. We are growing older and more diverse all at the same rate and time. The trends in immigration and birth rates will profoundly affect the majority of the racial and/or ethnic group within the United States. Presently, 1 in 10 United States counties have a population of roughly more than 50 percent minority [2]. Hispanics are the fastest and youngest growing population. Studies [1], [16], and [17] have indicated that younger populations are the utmost diverse and will have the greatest impact on population changes in higher education. According to the [2], the United States population is also growing. The population grew 9.7 percent from 281.4 million to currently 308.7 million between the years of 2000 and 2010. By 2030 the Baby Boomers aged 65 and above plus roughly one out of every five United States residents will be entering into the so-called Golden years. The population of individuals 65 and older will more than double by 2050 and those individuals 85 years and older will more than triple [3]. Due to the changing trends of higher education we will need to work harder than ever to meet the demands of individuals living longer and wanting to continue their education.

### 3. Diversity and Education

[3] projects that minorities will be the majority by 2023, and will also become the working age of Americans by 2039 thus the majority of all Americans by 2042. This will happen in various sectors across the United States in various parts from north to south, and east to west. No matter where students choose to pursue their college education, they can expect to work and live in communities that will be more diverse than the past. Furthermore, by 2025 students seeking to study abroad are projected to rise about 8 million [18]. College students enrolled in higher education are anticipated to be more than double to 262 million by 2025 [19]. Much of this growth will be in India and China alone. The projections simply mean that there are going to be big changes to come in higher education to include reformation of admission requirements, residency requirements, international students, remediation, financial aid, and performance status. Caucasians remain the nation’s largest racial group but their birth rate has been declining. Society can wait for years later or realize now the fact that our future in higher education is already here in this decade. Additionally, not only does the system need to be concerned about diversity but also about gender; for instance, women now make up about 57 percent of all college students according to the [2]. The gender gap is broadening and the trends are that many of the students beginning college are not prepared; they are lacking in academic preparation. In 2012, a third of all incoming college students were taking remedial classes [2]. Many of these students are first generation students. Many of the slots open for students are selected to be given to middle and upper income families whereas in contrast many of the future students will be the first in their families to pursue a college education. Many of the changing landscape as it relates to diversity and higher education will be fueled by the decision how to make sure college graduates are more prepared to enter the workforce after they graduate. There is a rising number of American workers at every skill level that will be in direct competition with workers around the globe. This is where institutions and society will feel the effect of globalization. Higher education institutions will need to work harder and more competitively to prepare students to invoke their creativity, and innovation within the workforce. Students no longer need a rudimentary education because that era has become completely extinct.
Institutions have to be willing to change the educational systems and face the simple fact that without change meeting the many demands of the ever changing workforce will become elusive. From 1976 to 2004 the American colleges and universities had been divided into colleges that have and others that do no have; as highlighted in this research the levels are from dropouts to graduate school [4]. Since the early 1980s a college degree compared to a high school diploma has grown tremendously. Due to this growth, there has been a surge in enrollment in college campuses over a decade. The total number of undergraduate students has increased up to 8 million since the 1980s because of the belief by Americans that pursuing college education will guarantee financial success. On the other hand, even though the probability of students pursuing a college education was on the rise, only 50 percent of the students were successful in obtaining a college degree, while the others dropped out [5]. Higher education now has a different meaning, college education path for success now has shifted to individuals to have increasingly multiple credentials that they are able to earn over a lifetime of achievement in this paradigm. As a result, in the shifts of the population from South, West, Midwest and Northeast spirals down to the fact that the prime spot for recruiting college students traditionally will be in the South according to the predictions [6]. In the past most higher education institutions were focused on graduates after high school, that is no longer the plan now, it is imperative that institutions keep a close watch on the K-12 enrollment and also birthrates now than ever before due to the competitive recruitment markets. The 2012 U.S. Census was a paradigm shift for the world due to the aging population. [7] reported that for every one hundred 18 yr. olds there are approximately ninety-five 4 yr. olds. The US Census Bureau provided institutions the mirror into the future and what to look forward to for the next decade ahead. Institutions of higher learner can no longer rely on the Caucasian students to fill their classrooms anymore. The Midwest and Northeast will face the largest decline of Caucasian students by 2020 [6]. With the current fiscal conditions of higher education systems, many students are left with making decisions to attend under resourced community colleges rather than going to state colleges and universities [8]. The state appropriations for the academy has been on the decline and unfortunately have not been able to keep up with inflation or the demanding increases in enrollment. This has projected to be the lowest since the year 1980 according to [9]. As a result, families and students are having to pay for most of the cost of their education where over a decade ago free tuition for students paid for about one third of the cost of the education [20]. It is proposed that if these trends continue, state spending on higher education will cease to exist in the future [10].

4. Faculty today and tomorrow in higher education

[11] has indicated that the number of professors age 65 and older has more than doubled over the last decade. A comparison from 1978 to present, the percentage of faculty over the age of 60 which was only at 8 percent and currently 25 percent of tenured and tenured-track professors are now approaching the age of 70. Furthermore, it is projected that professors who are in their 40s and 50s should make up half of the department [12]. In 1969, tenured and non-tenured track positions made up 80 percent of the faculty. Today, less than a third of the professors are either tenured or on tenure track. The use of part-time faculty has accelerated at such a high rate due to the financial constraints and budget cuts. This has made it difficult for institutions to make a commitment for the longevity of their faculty members. The current trend has forced institutions into hiring many adjuncts without contracts. Historically, adjunct faculty had full time jobs elsewhere and were sought after for their expertise within a particular subject matter or discipline. There is an emerging body of evidence that the use of adjuncts into higher education programs is having a negative impact on student success and outcomes. [13] reported that there was a 10 percent increase in part-time faulty positions that resulted in a 3 percent decline in graduation rates. Can higher education institutions afford a decline in graduation rates at this stage? The answer simply is no and this leads to such high scrutiny in retention and graduation rates, where the focus is to provide some type of short time relief.

5. Faculty and Instructional Design Course Syllabi for the Future

Today, faculty members have to try to stay above the line for pedagogical learning for students. Historically, faculty members were always found to develop and build their own syllabi, course textbooks and lectures but unfortunately with the increase and abundance in the online platform of education over the past two decades, the instructional designer or instructional technology team has moved towards advancing faculty to shift from daily face to face courses towards virtual courses where their educational material is presented in an online platform. With this approach, faculty are able to assess their own teaching and presentation styles which began to change the way faculty look at learning style of students. As technology continues to be at the forefront in the college classroom on many campuses to deliver content based approach to
assess learning and engagement, it is hypothesized that this approach is projected to possibly become the norm on college campuses in the future. This shift of pedagogical teaching has caused faculty to consider 21st century skills of their students. [14] reported that the skills needed to students to success in the future are based on three areas: 1) cognitive, 2) intrapersonal and 3) interpersonal and that teaching and learning should focus more on creativity, imagination, collaboration, critical thinking and problem solving for the job market. In spite of these challenges, higher education is still operating from a 19th century model that will not be effective for 21st century students. There is a new learning paradigm proposed in higher education that has several trends. The first has to do with the college admission process. How can institutions teach the youngest students and begin to market and prepare them for college? [15] proposed to make contact with students at least up to the 8th grade instead of 10th grade; studies reported that this is too late and that institutions must begin their marketing process as early as possible. Second, the use of online applications has moved students to apply more to colleges than ever before; however, with the continued advances in technology today the time has come to reconsider if an application is needed for college admission. Higher education systems could utilize various online database organizations for students to market and create profiles for institutions as this would aid colleges and universities in recruitment rather than wait for an application to arrive in the mail. Third, some colleges and universities are considering to offer free Massive Open Online Courses (MOOC’s) this would enable programs to discover talented students. This allows students to get an experience of what college is like without little risk if possible.

6. Competency Based Learning in the Academy

The competency based learning approach allows students to move at their own pace highlighting what they know instead of through the lens of sitting in the classroom face to face. This approach was frowned upon during the 1970s but the attitudes have shifted and the change towards this is positive. The setup of this approach is self monitoring, course access, and demonstration of mastery which is totally different from the research papers, assignments and assessments being done now. This approach can be controversial due to the faculty members lack of understanding as how to implement such an approach within a program. The bottom line is that the economy is demanding and requires higher skills for learning and this correlates to the future of our students who actually receives a high school diploma will need to demonstrate their learning through an array of techniques that facilitates learning in the academy. Faculty are moving beyond the Learning Management System (LMS) to find various other study aids to enhanced student learning such as YouTube, TED, Amazon, Facebook, and Twitter. Faculty are better able to track student learning and retention if necessary through such a flipped classroom model approach. This shows true promise as to higher educational systems having the ability to track and collect data on the actual teaching and learning moments in the classroom. Globally, higher education institutions have been rethinking and redesigning their pedagogical practices and spaces in order to accommodate new learning platforms. The most important goal for higher education is to be able to equip students with the skills they need in order to be successful in the workforce and to most of all make an impact on the world economy.


There are many ways in which one would open the lens to look into globalization of higher education. It is a necessity for students to know and understand the world and the global community. Institutions are finding creative ways to integrate course curricula, practicum/internships across a global perspective within the curricula of programs. In some instances, institution programs have implemented international studies and/or global studies programs and/or coursework that can be required as the pursuit of a degree or additional coursework. Additionally, there are growing opportunities for study abroad or study away experiences so students have the opportunity to be able to be immersed within various cultural and diverse cultures around the globe. Globalization has affected all walks of human life. To have an effective global education program it is recommended to teach about cultural and linguistic diversity, economical, political and technological advances which draws upon the experiences and areas of specialization for faculty in many disciplines. The integration of the globalization process in higher education opens the minds of students’ viewpoints and challenges their thinking and that of the world at large. The opportunities assist students to obtain an appreciation for their own culture and equips them with the essential skills in order for them to triumph in a global economic world.

8. Conclusion

Students today in our institutions are more digitally literate than previous generations due to the changing demographics, diversity, and the trend of the immersion of technological rich environments. It
is important for higher education programs towards the future to have a reality check. We must equip students with the digital literacy skills that would allow them to be dynamic in an ever changing work environment. More and more demand is impacting the rising cost for an education. Higher education is considering the move towards performance based measures of students such as student access and successful completion and innovative technology. Taking this into consideration for years to come will allow students to use technology which they are already comfortable with but providing them with the ownership over their learning. It has been projected that over 80% of undergraduate students own a smartphone or tablet, today’s students are expected to be able to use whatever devices that they choose to access learning, take notes, complete and submit assignments, complete projects and frequently communicate with their peers and instructors. This process will impact how faculty update their knowledge in ways that they are able to deliver content and assess student learning in the future [20]. The world of higher education is one of the fastest changing markets ever in this ever changing global economy. Higher education institutions will need to work with low wealth schools and communities to advocate for increased resources in order to improve students read for college. Additionally, plans must be in place for low income, first generation African American and Hispanic/Latino students who make it to college. This could possibly mean the necessity for more academic support, integration of English as a Second Language, and remedial education programs.

9. References


PhD and Doctorate Consortium

The idea of writing a research paper or developing a topic of research interest that can lead to a PhD / Doctorate degree or proposal is always an endless thinking of where, when, why, what and who. Therefore, becoming an experienced researcher and writer in any field or discipline takes a great deal of practice. The Consortium has the following objectives:

- Provide a supportive setting for feedback on current research that will stimulate exchange of ideas;
- Guide on the future research directions;
- Promote the development of a supportive community of scholars and a spirit of collaborative research;
- Contribute to the conference goals through interaction with other researchers and conference events.

The PhD and Doctorate Consortium highlights possible solutions in response to the lack of competence demonstrated by young researchers and PhD and Doctorate students, and the understanding of what contributes to knowledge gap.

Organiser: Charles A. Shoniregun, Infonomics Society UK and Ireland
Sessions
Session 1: Learning / Teaching Methodologies and Assessment

Scaffolding Executive Function Processes During Note-taking for Students with Learning Disabilities
(Author: Joseph R. Boyle)

Assessment Strategies and Evaluation Software Developed for Electrical Engineering Program at AUST
(Authors: Mustahsan Mir, Hamd Alizade, Fahar Hayati)

Useful Activities for Improving Attitude in Creating Book Recommendation Slides by Means of PowerPoint
(Author: Isao Miyaji)
Scaffolding Executive Function Processes During Note-taking for Students with Learning Disabilities

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Abstract

Executive function difficulties of students with learning disabilities (LD) have been implicated as the reason why these students struggle with complex academic tasks such as reading, writing, and note-taking [8]. This mixed-methods study explored the extent to which a strategic note-taking intervention enhanced the deployment of effective strategies to mediate executive function difficulties among students with LD during note-taking. This paper draws on interviews, students’ notes, and pre- and post-intervention assessments to present case studies of three student participants. Results indicate that the strategic note-taking intervention served as a scaffold, helping struggling students to mediate executive functions and flexibly deploy cognitive strategies. These cases shed light on the potential for cognitive scaffolding to help students actively improve their own executive functioning in complex tasks such as note-taking.

1. Introduction

Note-taking during lectures is a cognitively demanding task that involves listening, processing, organizing, and writing skills synchronously, while also dealing with the temporal demands of the lecture. Unlike other academic tasks that allow students to periodically pause to catch their thoughts, like reading a book or composing an essay, the temporal nature of recording notes during lectures makes it difficult for students to slow down because if they do, they risk missing subsequent lecture points spoken by the teacher [12].

To compound matters, students with mild disabilities (e.g., LD, ADHD) are often characterized as having executive function difficulties that interfere in complex writing and planning tasks such as note-taking [13]. For students with disabilities, the temporal demands combined with executive function difficulties may result in poor note-taking skills. These students would miss important lecture information that will result in incomplete or illegible notes and, ultimately, result in poor performance on measures of lecture comprehension [2], [9].

In order to assist students with disabilities at recording notes during lectures, they were taught how to use a strategic note-taking intervention, and, in turn, this study examined its use from an executive function perspective. Therefore, the purpose of this study was to examine: 1. How were students able to use strategic note-taking to mediate the cognitive challenges associated with note-taking during lectures? 2. How did this note-taking intervention impact EF difficulties during note-taking?

2. Method

This mixed-methods study was conducted in two suburban middle schools in the Northeastern United States. The research team introduced a strategic note-taking intervention to learning disabled students and their non-learning disabled peers in four 7th grade science classes and used both qualitative and quantitative measures to better understand the effect of this intervention on the cognitive processes of the students with learning disabilities. Quantitative measures included a scored note-taking task and pre- and post-lecture quizzes. These measures were administered to students with and without learning disabilities. Qualitative measures included semi-structured interviews with all participants with learning disabilities and analysis of these students’ notes. The analysis presented here draws on both the qualitative and the quantitative data, with a stronger emphasis on the findings from our qualitative interviews. The interview data provided insights into how change was occurring for these participants.

2.1. Participants

With the goal of understanding how students with learning disabilities used our strategic note-taking intervention, purposive sampling, or the selection of individuals who meet a particular set of criteria [7], was used to identify potential study participants. The goal was to include all students.
with learning disabilities in the classes that were implementing the intervention. Teachers of 7th grade science were recruited and received a monetary stipend for their participation.

2.2. Strategic Note-Taking Intervention

2.2.1 CUES+ strategy and SN paper. The strategic note-taking intervention, adapted from Boyle [3], Boyle and Weishaar [6], and Lee and colleagues [10], is comprised of two parts, the mnemonic CUES+ (i.e., “C”-Cluster, “U”-Use, “E”- Enter, “S”- Summarize, + - abbreviations, symbols, or pictures) strategy and the strategic note-taking (SN) paper.

C – Cluster – Cluster together 3 to 6 main points of the lecture
U – Use – Use teacher cues to record ideas
   Number Cues – ex. there are six parts to the cell
   Importance Cues – ex. this really important to remember…
E – Enter – Enter important vocabulary
S – Share – Share important ideas from the lecture with your partner
+ – Plus – add or use abbreviations, pictures, or symbols to personalize your notes

Figure 1. Strategic Note-taking Strategy

2.2.2 CUES+ strategy. In the CUES strategy, each step prompts the student to perform an action using lecture information and the SN paper. In the Cluster step, students are asked to cluster lecture information into manageable units of three to six related ideas and record the chunked ideas on the SN paper. The Use step prompts students to pay attention and listen for teacher cues (i.e., number cues and importance cues) during the lecture and, when they hear these cues, record the lecture points that are associated with them. In the next step, Enter, students are asked to listen for vocabulary words and record any vocabulary words from the lecture in the appropriate area on the SN paper. In the Summarize step, students are asked to write a word or words that would categorize the three to six lecture points they have already listed (i.e., clustered together) on the SN paper. In the + step, students were told to use abbreviations, symbols, or pictures as they recorded notes.

2.2.3 Strategic note-taking paper (SN paper). The SN paper placed boxes with guidelines for types of information students should record. At the top of the paper, students recorded the topic and include any background knowledge they may have on the topic. Students then group together three to six main points from the lecture with details. At the end, students were prompted to summarize the lecture ideas. There was also a separate section for key or new vocabulary words to be listed and defined.

2.2.4 Pre-/post-intervention note-taking task. Baseline was determined by administering a mock lecture during which they would listen and record notes using traditional note-taking. The mock lecture was comprised of a 15-minute video lecture on Electro-Plasma Rockets. Following the video, notes were collected and students were administered an immediate free recall (IFR) test, during which they were given a blank paper and asked to write down as many facts, ideas, and vocabulary from the lecture as they could within three minutes. The IFR was collected and students were administered a 10-question multiple-choice quiz. This same procedure was used as a posttreatment measure with the only difference being that students used the strategic note-taking intervention to record notes. Scoring of the measures occurred by undergraduate and graduate level students scoring the notes and IFR on three criteria: Cued Lecture Points, Total Lecture Points, and Vocabulary. The quiz was scored using an answer key.

3. Results

Using the quantitative measure of change in cued lecture points (CLP) between the pre-test and the post-test, we identified three students who demonstrated significant increases in CLP so that we could inquire into how they used the CUES+ strategy and how it functioned to alter their thinking and learning.

Mel’s Pre/Post Test Scores

Figure 2. Mel’s Pretreatment and Post-treatment Measures

Values of Cued Lecture Points (CLP) out of 15, Total Lecture Points (TLP) out of 78, and vocabulary instances (Vocab) out of 91. Mel displayed large gains in the CLP and TLP categories.
Mel learned to use teacher cues to help her identify important points from each lecture. Interviewer: What are you listening for when the teacher starts speaking?

Mel: I’m listening for important information that are cues.

Interviewer: Now you have been using the CUES note taking how has it changed the way you take notes.

Mel: I write down what the CUES stands for when my teacher goes over it and put a star next to the CUES so I know they are important.

Jim’s Pre/Post Test Scores

![Figure 3. Jim’s Pre-treatment and Post-treatment Measures](image)

Values of Cued Lecture Points (CLP) out of 15, Total Lecture Points (TLP) out of 78, and vocabulary instances (Vocab) out of 91. Jim displayed large gains in the CLP and Vocab categories.

Jim learned how to Prioritize and Organize and displayed shifting and cognitive flexibility.

Interviewer: When the teacher starts the lecture, what are you doing?

Jim: Listening waiting for something that’s important, and if there is some stuff that I think is important that wants really cued then I just put it down.

Interviewer: What do you do then?

Jim: So like you put a check or a symbol and then write down what he says.

Interviewer: What are some specific parts of the CUES strategy that help you when you are taking notes?

Jim: Um when I share because I can get other people’s note and see how like how they did it, see what else like if I missed something that I can add and study from that.

4. Discussion

Although the CUES note-taking strategy ultimately led to positive outcomes for all three of these students, there was great variety in how it scaffold their learning: Mel learned to use teacher cues to help her identify important points from each lecture. Jim learned to organize and prioritize information; Roman used CUES to learn when and how to imitate taking notes.

For teachers and other educators, using a strategy during complex tasks helps students with EF difficulties to plan, organize, and prioritize information, particularly written information. Strategies provide these students with the structure to attack these learning tasks in a planful and organized manner and by prioritizing important information: something that occurs intuitively in students without such difficulties. Likewise, visual organizers (e.g., note-taking formats) serve as an external scaffold to help students more easily integrate new strategies while learning content [11].
5. References


Assessment Strategies and Evaluation Software Developed for Electrical Engineering Program at AUST

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Abstract

The rubrics-based assessment, that directly determines the extent to which student or program outcomes have been attained, is associated with increased consistency of scoring, especially when multiple instructors are teaching the same course. On the other hand, assessment based on course learning outcomes has the advantage that in addition to providing an overall evaluation of the attainment of student or program outcomes through a mapping process, it also provides the instructors feedback on how well the course learning outcomes have been achieved and what improvements need to be made at the course level. For the electrical engineering program at Ajman University of Science & Technology (AUST), a combination of both assessment strategies has been adopted in order to obtain greater insight in the strengths and weaknesses of the program for its continuous improvement. Also, evaluation software was developed to systematically analyze the data obtained from two different strategies, as explained in this paper.

1. Introduction

Accreditation is a quality assurance process to ensure that applicable standards are met for the program under consideration. For engineering and technology programs, Accreditation Board for Engineering and Technology (ABET) is a well-known US-based accreditation organization [1] that focuses on outcomes-based assessment. It requires the program to demonstrate the attainment of specific student outcomes (SOs), that is, what students are expected to know and able to do by the time of their graduation.

ABET accreditation requires the program to be appropriately assessed, evaluated, and the results utilized for its continuous improvement. Assessment is defined as one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes while evaluation refers to the process of interpreting the data and evidences accumulated through the assessment process [2].

The course learning outcomes (CLOs) are designed, along with course syllabi and appropriate teaching and assessment methods to achieve the specified student outcomes [3]. Therefore, assessment of course learning outcomes and evaluation of resulting data, through a mapping between CLOs and SOs, would demonstrate the extent to which the student outcomes have been achieved. This approach will be referred to as CLOs-based assessment. Another common approach, namely rubrics-based assessment, directly assesses the SOs using well-defined rubrics [4]. Both approaches have their own advantages. The rubrics-based assessment has the advantage that it provides a uniform basis for assessment and directly determines the extent to which student outcomes are attained, without requiring any mapping process. The CLOs-based assessment has the advantage that it covers a wider spectrum of courses and determines how well the CLOs have been attained in different courses while providing an overall evaluation of the attainment of SOs through a mapping process. By carrying out both assessment processes, as has been done for the electrical engineering program at AUST, significant insight in the strengths and weaknesses of the program in achieving the intended SOs, at both the course and program levels, can be achieved. The resulting evaluation results from both assessments would provide valuable information for continuous improvement of the program.

2. Assessment strategies

The rubrics-based assessment process identifies, collects, and prepares data for directly evaluating either the performance indicators (PIs) or student outcomes (SOs) using well-defined rubrics and without involving any mapping. On the other hand, CLOs-based assessment does not utilize any rubrics but it is based on the quantitative data related to attainment of course learning outcomes (CLOs) and their mapping to PIs or SOs. For the rubrics-based assessment, usually some selected courses are considered for both formative and summative assessments, while for CLOs-based assessment most
or all required courses may be considered for overall program assessment.

In [5], Rogers has supported rubrics-based assessment and argued against using course grades for program assessment for various reasons. One mentioned reason is that course content for any given subject may vary among faculty teaching the same course. The other given reason is that the grading policy in any course is dependent on the individual faculty. For instance, some faculty may give grades for things not related to student learning (such as attendance) and some faculty may grade on a curve while others have a fixed standard. According to Rogers, letter grades or numeric marks reflect the student’s relative standing within the class and do not indicate what the student knows or can do. While these arguments are valid and grades or numeric marks as such should not be used for program assessment, it is important to differentiate between grades-based assessment and CLOs-based assessment even though both utilize students’ grades as assessment data.

Firstly, the course learning outcomes (CLOs) describe the abilities of students to be attained in a course. Accordingly, the course syllabus is developed and teaching methodologies defined to ensure that the specified CLOs could be achieved by students at the completion of the course. It is the responsibility of the instructor(s) to focus on the task of achieving the specified CLOs. Thus, even if the content of a course taught by different instructors may differ to a certain extent from one another, the goal of covering all CLOs remains the same. Secondly, in CLOs-based assessment, grades for things not related to student learning (such as attendance) do not affect the assessment as the grades used are not the overall course grades but grades obtained by students for each course learning outcome. Similarly, the question of difference in grades due to use of a curve or a fixed standard by different faculty teaching the same course does not arise since CLOs-based assessment is not dependent on overall grades of students in a course. There is still, however, a concern that different faculty may grade differently the students’ response related to the same CLOs. But that concern is also applicable, to a certain extent, to rubrics-based assessment. And that’s why inter-rater reliability is an important issue in rubrics-based assessment. Just like in rubrics-based assessment it is important to carry out rubric calibration and inter-rater reliability processes, effective CLOs-based assessment requires well-defined CLOs and a common policy on grading guidelines.

The focus of this paper is not to compare the two different assessment approaches and prefer one over the other, but to utilize them as complement to each other with the aim of enhancing the validity of assessment process and obtaining more insight in the strengths and weaknesses of the program at both the program and course levels.

It is also worth mentioning here that despite much attention on the development of learning outcomes, the alignment of course outcomes with curricula and program-level assessment still poses a challenge internationally [6,7]. Furthermore, program-level assessment is usually not discipline specific. For instance, ABET a-k outcomes are applicable to all engineering disciplines such as electrical, mechanical, and civil engineering. In contrasts, course learning outcomes are quite discipline specific. Therefore analysis of both rubrics-based and CLOs-based assessments for the same program could provide an opportunity to better align the course learning outcomes with program-level assessment and bridge the gap between discipline-specific and non-discipline-specific outcomes-based assessment approaches.

3. Rubrics-based assessment

The rubrics-based assessment is associated with increased consistency of scoring especially when they are effectively designed, understood, and competently used with guidance provided for scoring rubrics [8]. Before explaining the design of rubrics for the electrical engineering (EE) program at AUST, it is helpful to list its twelve student outcomes (SOs). Eleven of these are the same as ABET’s A-K outcomes while an additional outcome (L) has been added. The reason for this addition is to satisfy the requirement of local accreditation that requires explicit demonstration of acquisition of knowledge by students. The complete list is as follows:

A. an ability to apply knowledge of mathematics, science, and engineering
B. an ability to design and conduct experiments, as well as to analyze and interpret data
C. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
D. an ability to function on multidisciplinary teams
E. an ability to identify, formulate, and solve engineering problems
F. an understanding of professional and ethical responsibility
G. an ability to communicate effectively
H. the broad education necessary to understand the impact of engineering solution in a global, economic, environmental, and societal context
I. a recognition of the need for, and an ability to engage in life-long learning
J. a knowledge of contemporary issues
K. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
L. an ability to demonstrate broad knowledge in the field of electrical engineering and specialized knowledge in chosen concentration.

For developing the analytic rubrics, each SO was represented by a set of Performance Indicators (PIs). Initially, four performance levels were selected to define, for each PI, what is expected of students in order to achieve a particular level of performance. These levels were labeled as Unsatisfactory, Developing, Satisfactory, and Exemplary with a score ranging from 1 to 4, respectively. After using these rubrics for one academic year, faculty feedback was sought. In order to improve inter-rater reliability, it was determined that the sudden jump from Satisfactory level to Exemplary level was causing difficulty in uniform scoring. Therefore, rubrics were revised to five-level rubrics, with scores of 1 to 5, as Poor, Developing, Satisfactory, Good, and Excellent. Also, there was some fine tuning in defining the PIs and the performance level descriptions.

Curriculum mapping was carried out in order to identify the courses to be selected for collecting the data for both formative and summative assessment. This was followed by IRE (Introduce – Reinforce – Emphasize) mapping which shows how different courses in the curriculum help students in gradually attaining the student outcomes or performance indicators, progressing from lower levels of learning to higher levels. For the selected courses, assessment instruments were discussed and finalized. Finally, the achievement criterion or expected level of attainment for each of the twelve student outcomes was defined as 70% of students achieving a score of 3 (satisfactory) or higher.

4. CLOs-based assessment

For an instructor responsible for teaching a course it is important to focus on CLOs of that particular course. The CLOs for every course were developed by concerned faculty members keeping in view the SOs and course goals. Thus, the ability represented by a CLO corresponds to an ability represented by a student outcome or one or more of its performance indicators. In other words, there is a well-defined mapping between the stated CLOs and SOs/PIs. As an example, the CLOs and their mapping to SOs/PIs for Principles of Communication course are given below. The six CLOs are:

1. Explain fundamental principles of communication theory.
2. Describe and compare Amplitude, Frequency, and Phase Modulation and Demodulation techniques.
3. Analyze basic modulation and demodulation circuits used in AM and FM systems.
4. Explain principles and operation of digital communication systems.
5. Conduct experiments related to analog and digital modulation systems in both time and frequency domains.
6. Perform computer-based simulations of analog and digital communication systems.

Mapping of these six CLOs to SOs/PIs is as follows:

```
<table>
<thead>
<tr>
<th>CLO</th>
<th>SO/PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L1</td>
</tr>
<tr>
<td>2</td>
<td>L1</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>L1</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>K</td>
</tr>
</tbody>
</table>
```

The student outcome L has been expressed by two PIs, L1 and L2, the former represents the ability to demonstrate broad knowledge in electrical engineering while the latter is for specialized knowledge in the chosen concentration (electronics, communication, instrumentation & control).

For CLOs-based assessment, all required courses offered by the Department of Electrical Engineering were considered. Mapping of these courses to student outcomes, based on the mapping of CLOs of these courses to SOs/PIs as shown in the above example, has indicated that each SO is assessed through multiple courses. Finally, the achievement criterion or expected level of attainment for each of the twelve student outcomes for CLOs-based assessment was defined as 70% of EE students shall attain the level of abilities represented by 70% marks or higher.

5. Evaluation Software

While commercial software packages are available for evaluating both rubrics-based and CLOs-based assessment data, it was decided to develop our own evaluation software specifically tailored to EE program and aiming to minimize faculty time on analyzing the data collected through assessment. By developing this software and appointing an administrator to acquire the assessment data from faculty and process it, the extra effort required from the faculty for implementing two different assessment strategies has been compensated to some extent. The developed programs are: RAP (Rubrics-based Analysis Program) and CAP (CLOs-based Analysis Program). The former directly assesses the SOs or PIs based on data obtained using Rubrics-based assessment process, while the latter utilizes a mapping between CLOs and SOs for analyzing the data obtained using CLOs-based assessment process, as explained below.
5.1. Rubrics-based Analysis Program (RAP)

The steps involved in the rubrics-based evaluation process are explained with the help of student outcome D (ability to function on multidisciplinary teams). This outcome has been expressed by four PIs as follows:

D1: Participate in team meetings
D2: Involves others
D3: Performs assigned tasks
D4: Demonstrates leadership

The screenshot of RAP output for student outcome D showing the distribution of students’ scores for four PIs among five different performance levels is given in Figure 1. It also shows that all four PIs have the same weightage of $\frac{1}{4}$, which is adjustable, if so desired for different PIs.

The program then calculates and plots the percent of students against the average values of four PIs for each performance level, as shown in Figure 2.

5.2. CLOs-based Analysis Program (CAP)

The data entry screenshot for CAP program is shown in Figure 4 for Electronic Devices and Circuits I course that has 8 CLOs.

Using the internally stored CLOs-SOs/PI mapping, it determines the corresponding percent marks of students for related PIs. It then calculates the percent of students achieving 70% or higher marks and compares with the specified acceptance criterion. A plot for four SOs (represented by a total of 15 PIs) is shown in Figure 5. The acceptance criterion is indicated by dotted line.
6. Conclusion

This paper has described the rationale behind implementing two different assessment strategies for electrical engineering program at Ajman University of Science & Technology. The rubrics-based assessment directly assesses the program or student outcomes (SOs) while the assessment based on course learning outcomes (CLOs) utilizes a mapping between CLOs and SOs to assess the program or student outcomes. As discussed in the paper, one assessment strategy compliments the other and both contribute in determining the strengths and weaknesses of the program and in its continuous improvement at both the course and program levels. Two different software programs developed for analyzing the assessment data are also explained.

7. References


Useful Activities for Improving Attitude in Creating Book Recommendation Slides by Means of PowerPoint

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Abstract

This paper reports how university students recommended books they are interested in by means of PowerPoint slides in order to equip with computer knowledge and skills. In this course, they were required to create PowerPoint slides to introduce books by inserting animations and narrations. It applied active learning in combination with evaluation and revision activities to enhance their computer skills, to raise awareness towards various types of skills necessary for problem solving and to nurture active thinking. It particularly aims not only to acquire PowerPoint skills but also to develop their skills in expression, project planning and suggestion. This paper reports useful activities for improving attitude.

1. Introduction

There are a number of attempts to propose new ways of teaching and to practice effective classrooms [8]. Currently, the Central Council for Education points out the importance of active learning that students actively discover and solve problems. It therefore encourages Japanese higher education to provide students with high quality education by promoting such active learning so that students are able to experience autonomous learning and acquire lifelong learning skills [6].

In the previous studies, I have identified the possibility of active learning for enhancing problem solving skills and nurturing active thinking in the classroom by applying the activities of self-evaluation, mutual assessment and revision in a task [7].

One of my studies reported that the third year university students enhanced their problem solving skills in an experimental course called ‘Creating Storytelling’. In this program, they were required to create stories about themselves in order to closely observe and understand who they were. Furthermore, in the process of creating the stories evaluation and revision activities were applied. Effects of creating three kinds of digital storytelling on student attitude was compared and revealed [9]. Evolution of literacy in software functions by creation of storytelling was reported [12].

Creative activities that produce works that inform and entertain people by describing real and imaginary events, using graphics, narration, and music are called storytelling [3], [16]. In digital storytelling, still pictures such as photographs, figures, and drawn pictures are displayed sequentially to create a storytelling and narrated. Still pictures are easy to handle for the producers of such assignments, and students can reflect upon memories or what they have learned through reviewing still pictures [2]. Kelleher [4] proposed to use storytelling to motivating programming. Tsou [15] explained that storytelling is a practical and powerful teaching tool, especially for language learning. Digital storytelling is in a good position to help teachers use technology in their classrooms effectively [14].

Ballast [1] has reported that the practical class improved the quality of their text narratives through the practice of digital storytelling, compared to the control class that did not practice it. Ku et al. [5] reported that storytelling task showed effect of similar patterns to the other tests in written language comprehension.

Another study of mine identified the effectiveness of a task to create PowerPoint slides to introduce commodities in the classroom. It aimed not only enhance students’ computer skills but also develop their expressive skills, project planning technique and proposal ability [10], [11].

Following this task, which consisted of seven lessons in total, we provided students with another seven lessons to create slides for book recommendation, which is the main data of this paper. This time, the structure of the course applied active learning so that they must have actively participated in the task in the classroom [13]. They created slides to inform books they are interested in by using animations and narrations. Later on, they watched all the slides in the class, evaluated and commented with each other. Based on the evaluation from other students and the teacher’s feedback, they revised the slides and watched them again. By actively conducting evaluation and revision in
interaction with others, the course attempted to raise their awareness towards various skills necessary for problem solving and to nurture active thinking.

This paper firstly explains the course content, the contents of the slides they made, how to make the slides and evaluation items in the assessment sheet. Secondly we will analyze the data and explain the results. We will report useful activities for improving attitude in introducing books. Finally we will demonstrate the difference in useful activities between these two tasks (introducing commodities and books).

2. Course Contents

2.1. Course contents and purpose

The course in this study is categorized in subjects of Information Technology (see Table 1), which is a compulsory subject for the third year students in A university. Students were required to choose one theme from three and the course was conducted according to the selected theme for 15 times (90 minutes per lesson). The number of the students who enrolled my course was 26, about one third of the whole third year students. In this course, students were required to create two different slides to introduce commodities and books (see Table 1 for the course procedure). The former seven lessons were for product recommendation and the latter seven for book recommendation. Slide observation and evaluation were conducted twice and revision was undertaken once throughout the tasks.

In this paper, we only focus on the latter task: book recommendation. The objectives of this course were (1) to acquire computer knowledge by actually using computers and (2) to make use of such knowledge in practice. It also aimed to introduce books they were moved and found interesting and knowledge in practice. It also aimed to introduce books they were moved and found interesting and useful to recommend others to read them. Students created six slides consisting of book information, summary, reasons why they recommend, tips for reading and related books. They had to use animations for easy understanding and recorded narrations in the slides. Through all of these processes, they were able to acquire writing skills and expressive skills by using pictures and diagrams. In this way, the purposes of the program were to raise students’ awareness towards various skills necessary for problem solving and to nurture active thinking by applying evaluation activities in the creative task.

2.2. Course Schedule

In this task, students had to consider how to recommend a book in an attractive way, including the way of explaining the book and how to insert visual images and photos such as cover pages. The course encouraged students to learn (1) how to express their thoughts and feelings towards the books by writing, images, animations and narrations and (2) how to encourage others to read the books they like. The course does not end by merely creating slides; students observe all the slides, evaluate each other and revise them.

In the first lesson, a 39-page booklet to explain the course objective, content, schedule, how to make slides and the way of experiment was distributed to the students. How to use animation and to record narration are already explained at the second and third lesson respectively. An image sheet for book recommendation was also provided in the seventh lesson. Students were required to explain the contents of books for recommendation at the right page of the sheet, draw a figure at the left page and bring it for the next lesson. In the eighth lesson, we made students to create slides. Later, students added animations in their slides. In the tenth lesson, students recorded narrations and completed the book recommendation slides. They submitted the files and we combined them into one file. In the eleventh

<table>
<thead>
<tr>
<th>Time</th>
<th>Class plan</th>
<th>Plan related to assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explaining Experiment method</td>
<td>Problem description, information retrieval, considering the description to introduce, inputing evaluation sheet 1</td>
</tr>
<tr>
<td>8</td>
<td>Creating slides to introduce books</td>
<td>Submission of the entry form, creating slide, completion of the report</td>
</tr>
<tr>
<td>9</td>
<td>&quot;</td>
<td>Creating slide, putting the animation</td>
</tr>
<tr>
<td>10</td>
<td>&quot;</td>
<td>Creating slide, recording narration, writing report 1</td>
</tr>
<tr>
<td>11</td>
<td>Evaluation and correction of slides to introduce books</td>
<td>Mutual evaluation, inputing evaluation sheet 2, modifying slide, writing report 2</td>
</tr>
<tr>
<td>12</td>
<td>Evaluation of slides to introduce books and report</td>
<td>Mutual evaluation, inputing evaluation sheet 3, writing report 3</td>
</tr>
<tr>
<td>13</td>
<td>Completion of the report and the evaluation sheet to introduce books</td>
<td>Revising and submitting report and an evaluation sheet</td>
</tr>
<tr>
<td>14</td>
<td>&quot;</td>
<td>Repeating a correction and submission until a report and an evaluation sheet are completed</td>
</tr>
<tr>
<td>15</td>
<td>&quot;</td>
<td>Completing report to introduce books</td>
</tr>
</tbody>
</table>
lesson, students watched all the slides in the classroom for evaluation. The evaluation results were written on the assessment sheets and they were collected at the end of the class. After that, they revised their slides according to the feedback. In the following twelfth lesson they again watched the revised slides and assessed them again. The evaluation sheets were collected at the end of the class.

Students wrote final reports. They submitted one-third each on the previous days of the eleventh, twelfth and thirteenth lessons. They were returned with the teacher’s comments within the lessons. They then revised and submitted the reports at the thirteenth lesson. They also filled in and submitted all the evaluation sheets. They repeated a correction and submission until a report and an evaluation sheet are completed at the fourteen and fifteenth lessons.

3. Contents of book recommendation slides

The purpose of this task is to consider how to encourage people to read what students recommend and to make attractive PowerPoint slides. Therefore students are required to simulate what to do when they are asked to manage a project in the future, to introduce books and insert visual pictures of cover pages in the slides.

Books must be the ones that students found interesting and useful. The number of slides must be six and the presentation must be completed within two minutes. The letter size should be more than 28 although 24 point is acceptable if necessary.

The structure of six slides is as follows;

1. Title of a Book and Catchphrase
   A catchphrase should be ‘a –like (or adjective) book in ○○’ or ‘the book of ○○ is …’. A picture of the cover page should be introduced.

2. Book Information
   Author, title of a book, year of publication, publisher, book size, the number of pages and price must be specified.

3. Book Summary
   Students must briefly summarize the book in order for others to understand the content of it. By inserting pictures, they must try to visualize the content.

4. Reason why I Recommend It
   Students explain their favorite parts of the books, reasons why they recommend them and impressive scenes they found after reading.

5. Tips for Reading
   Students emphasize important parts of the book and scenes to be touched and interesting. They also highlight what they recommend in the book.

6. Related Books
   By introducing related books, students will make others to be interested in the book recommended. Book information including the name of an author, title, year of publication, the number of pages and publisher must be specified. It is also possible to introduce several books written by the same author or some books whose stories are similar to the one recommended.

4. Analysis and results

In order to understand the effectiveness of learning in creating slides for book recommendation explained in the previous section, we conducted several surveys. One of them is to survey rating level of awareness relating to 30 kinds of skills shown in Table 3 before and after the class. Students asked to select useful activities improving each awareness among 33 activities shown in Table 2 in upper side of the survey sheet after the class.

To compare creating slides for product recommendation with creating slides for book recommendation, the following process is conducted. First, using cross table for the number of useful activities for awareness raising, awareness is categorized by cluster analysis. Next, by replacing a row with a column about the cross table, activities are categorized by cluster analysis. Then the number of times activities were listed in each cluster was totaled. Chi-square tests were performed using this cross table as a contingency table. If the result is significant, residual analysis is conducted. From the results we can know which activity cluster improves which awareness cluster.

Table 2. List of activity items

| 01 to listen to the instruction of the content of an experiment |
| 02 to understand the overview of the experiment |
| 03 to listen to friends about the content of experiment |
| 04 to listen to teachers and TAs about the content of experiment |
| 05 to use a computer |
| 06 to use Word |
| 07 to use Excel |
| 08 to use PowerPoint |
| 09 to draw figures with paint |
| 10 to divide the product to sub-products |
| 11 to examine products |
| 12 to organize what to research |
| 13 to create a story |
| 14 to create slides |
| 15 to add animation in the slides |
| 16 to record narrations |
| 17 to explain the content of the slides to friends |
| 18 to ask questions about the slides to friends |
| 19 to evaluate own slides |
| 20 to reevaluate own slides |
| 21 to reevaluate own slides again |
| 22 to watch others’ slides |
| 23 to watch others’ slides again |
| 24 to evaluate others’ slides |
| 25 to reevaluate others’ slides |
| 26 to analyze evaluation from others about the slides |
| 27 to analyze the comments from others about the slides after revision |
| 28 to compare self-evaluation with other’s evaluation |
| 29 to revise the slides |
| 30 to write a report |
| 31 to revise the final report |
| 32 to revise the report according to the teacher’s feedback after submission |
| 33 others |
4.1. Categorization of awareness by cluster analysis: Using the number of useful activities for awareness raising

We set up a row showing awareness relating to 30 kinds of skills and a column signifying 33 activities. We counted activities useful for raising awareness in both tasks for product recommendation and book recommendation and created a 30 rows × 33 columns Cross-Tabulation. Based on this table, we applied cluster analysis by following Ward’s Method with awareness as cases and activities as variables. By cutting the dendrogram by the dissimilarity 7, awareness can be categorized into three (Categories I-III).

The first category I consists of 21 types of awareness including: (24) self-satisfaction; (25) self-achievement; (26) problem solving skills; (20) skills to ameliorate and improve ideas; (14) skills to explain something in an easy way; (15) presentation skills; (13) skills to express your thoughts without writing; (8) autonomous learning skills; (9) information gathering techniques; (10) data management skills; (11) skills to analyze information; (21) skills to explore something deeply; (5) task setting; (6) task planning; (22) performance; (28) ability to think and produce ideas; (29) creative skills; (27) ability to systematize knowledge; (7) deep understanding of knowledge; (30) interests and come up with ideas by oneself; (18) communication ability; (19) ability to appropriately self-evaluate one’s thoughts; (3) ability to appropriately self-evaluate other people’s thoughts; (2) ability to cooperate and improve on one’s own thoughts; (1) ability to pursue matters deeply, ability to explore matters; (23) ability to analyze information; (17) ability to analyze information; (20) ability to execute, ability to practice, and ability to put into action; (21) ability to cooperate with others, ability to study in cooperation with others; (22) ability to cooperate with others, ability to study in cooperation with others; (24) sense of accomplishment, sense of satisfaction; (23) creative skills; ability to create; (25) ability to appropriately self-evaluate one’s thoughts; (26) ability to appropriately self-evaluate other people’s thoughts; (27) ability to appropriately self-evaluate one’s thoughts; (28) ability to appropriately self-evaluate other people’s thoughts; (29) ability to appropriately self-evaluate other people’s thoughts; (30) ability to appropriately self-evaluate other people’s thoughts; (31) ability to approach other people’s thoughts; (32) ability to approach other people’s thoughts; (33) others.

Category II includes five types of awareness: (17) communicative competence; (23) collaborative learning; (16) listening skills to other’s talk; (19) evaluation skills towards other’s ideas and (18) self-evaluation skills towards own ideas. The average frequency of useful activities for these types of awareness was 109.2, which is a little bit smaller than the total average value. The items (16), (18) and (19) were relatively high so that Category II is ‘awareness concerning listening and evaluation skills’.

The third category III includes four types of awareness: (1) interests towards computers; (2) understanding of computer; (3) computer skills and (4) how to use computers in broader contexts. The average frequency of useful activities for these types of awareness was 153.3, which was the highest in three categories. All four items were higher than other 26 evaluation items, showing that many activities were useful for raising awareness. Therefore Category III can be ‘awareness of computer’.

4.2. Categorization of useful activities by cluster analysis of the number of activities for raising awareness

In order to identify the useful activities for students’ raising awareness, we analyzed the 30 × 33 Cross-Tabulation of both tasks used in 4.1. We applied Cluster Analysis by Ward’s Method, setting activities as cases and awareness as variables. When cutting the dendrogram by the dissimilarity 7, the activities were categorized into three clusters (Group 1-3).

Group 1 consists of 21 activities including: 20 to reevaluate own slides; 21 to reevaluate own slides again; 19 to evaluate own slides; 22 to watch others’ slides; 23 to watch others slides again; 24 to evaluate others’ slides; 25 to reevaluate others’ slides; 9 to draw figures with paint; 15 to add animation in the slides; 31 to revise the final report; 32 to revise the report according to the teacher’s feedback after submission; 29 to revise the slides; 27 to analyze the comments from others about the slides after revision; 28 to compare self-evaluation with other’s evaluation; 33 others; 26 to analyze evaluation from others about the slides; 17 to explain the content of the slides to friends; 18 to ask questions about the slides to friends; 4 to listen to teachers and TAs about the content of experiment; 3 to listen to friends about the content of experiment and 16 to record narrations. Particularly, the frequency of the items 3 and 16 is high so that this group is classified as ‘Activities asking a question or activities relating to narrations’.

Group 2 consists of 8 activities including 11 to research the content of a story; 12 to organize what to research; 1 to listen to the instruction of the content
of an experiment; 2 to understand the overview of the experiment; 10 to decide the title of a story; 13 to create a story, 30 to write a report and 14 to create slides. The frequency of the items 1, 2, 11, 12 and 14 is high so that this group is categorized as ‘Activities of slide creation’.

Group 3 consists of 4 activities including 6 to use Word; 7 to use Excel; 5 to use a computer and 8 to use PowerPoint. Frequency of all items is high so that the group is called ‘Activities for software use’.

4.3. Analytical results about useful activities for students’ raising awareness

A Cross-Tabulation concerning awareness and activities is 30 rows X 33 columns. By using clusters from both tasks, we aggregated the frequency in the second task. The result is shown at the upper left of Table 4. We did $\chi^2$ test by using this table as 3×3 contingency table. The result shows that the deviation of frequency was significant ($\chi^2 (4)$= 6285.3, p<.001). The result of residual analysis is shown at the lower left of Table 4. We put * for the cells whose deviations are positive in the significant cells (see Table 4 at the lower right corner).

By this results, it is identified that Group 1 ‘activities asking a question or activities relating to narrations’ is useful for students’ raising ‘awareness concerning listening and evaluation skills’, which is Category II.

It is also seen that Group 2, ‘activities of slide creation’ is useful for raising ‘awareness of task setting, deep understanding and interests’, which equates to Category I.

Finally, it is found that Group 3, ‘activities about software use’ is useful for raising ‘awareness of computers’, which is Category III.

<table>
<thead>
<tr>
<th>Cluster of Activity</th>
<th>Cluster of Awareness</th>
<th>Observed frequency</th>
<th>Expected frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Activities asking a question or activities relating to narrations</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Awareness to task setting, deep understanding and interest</td>
<td>753</td>
<td>199</td>
<td>2305</td>
</tr>
<tr>
<td>2. Awareness concerning listening and evaluation skills</td>
<td>417</td>
<td>80</td>
<td>196</td>
</tr>
<tr>
<td>3. Awareness of computer</td>
<td>97</td>
<td>88</td>
<td>613</td>
</tr>
<tr>
<td>Total</td>
<td>1267</td>
<td>1260</td>
<td>3484</td>
</tr>
</tbody>
</table>

5. Discussion

The number of activities enumerated in the classes for introducing commodities and books was 1708 and 1756 respectively. The number of activities enumerated in both classes was the almost same. The useful activity clusters for raising awareness of the acquired skills after practicing the task also for both classes were the same.

About two introduction slides, I consider the list which added up the number of the enumerated activity every attitude to be contingency table. $\chi^2$ test was conducted by using this 2×30 table. The result shows that the deviation of frequency was no significant ($\chi^2 (29)$= 8.8, p>.05).

Similarly, I consider the list which added up the number of the enumerated activity every attitude to be contingency table. $\chi^2$ test was conducted by using this 2×33 table. The result shows that the deviation of frequency was significant ($\chi^2 (32)$= 50.9, p<.05). As the result of residual analysis, the numbers of activities 4, 8 and 17 were significantly many in commodity slides. In the product introduction slide, it is more useful to ask a teacher experiment content and to explain a slide making using PowerPoint to a friend than the slide of book introduction. In the other hand, the numbers of activities 5, 14, 24 and 28 were significantly many in commodity slides. In the product introduction slide, it is more useful to create slides, to use a computer, to evaluate others’ slides and to compare self-evaluation with other’s evaluation than the commodity slide.

6. Conclusion

In this study, we designed and practiced a course to make students create PowerPoint slides for book recommendation by applying the idea of active learning. Students selected books they recommended,
researched them, considered the contents of the slides, created the slides, added animations and recorded narrations. Furthermore, they watched others’ slides and learned from them. They mutually evaluated and commented. After all this, they revised, watched and evaluated the slides again. By interacting with other students for completing the task in this way, they were able to experience active evaluation and revision activities. In consequence, they enhanced problem-solving skills and nurtured active thinking through the classroom practice.

The findings from this class can be summarized as follows:

(1) Activities asking a question or activities relating to narrations is useful in enhancing awareness relating to listening and evaluation.

(2) Activities relating to creating tasks are useful in enhancing awareness relating to task setting, deep understanding and interests.

(3) Activities relating to using programs is useful in enhancing awareness relating to computers.

(4) Activities useful for improving attitude are the same in creating product and book introduction slide.

(5) As more useful activity only seven activities differ between creations of two kinds of slides.

In the future, we would like to compare the effects of this class with the effects of the above-mentioned storytelling [9]. We would also like to apply innovation to class methods to improve learning ability for students with a wide range of learning abilities.

7. Acknowledgements

This work was supported by JSPS KAKENHI Grant Number JP25350364. The author would like to express appreciation to the students who were surveyed and who helped collect educational information.

8. References


Session 2: Higher Education

Benefits of Multilingualism and Study Abroad Programs in Career Development
(Author: Ryan McMunn)

Reimagining Higher Education in Russia: Let’s Go Online
(Authors: Julia Lopukhova, Elena Makeeva)

Post-Graduate Mentoring: Critical Benefits for Practitioners and Higher Education Alike
(Authors: Thomas Hughes, Jennifer Mouw)
Benefits of Multilingualism and Study Abroad Programs in Career Development

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Abstract

Thanks to recent technological advances the world is changing – very quickly – into one big global market place. That means being able to communicate is crucial. Job recruiters say that being able to speak another language is important for success in today’s business environment, and will become even more critical over the next ten years. There is also a need for employees who have experienced working for businesses in other countries and who are familiar with various styles of leadership.
Reimagining Higher Education in Russia: Let’s Go Online

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Abstract
This extended abstract is devoted to the problem of reimagining higher education in Russia as higher education today needs significant changes. University graduates lack adequate training, real-world experience and practical knowledge. The paper proposes three innovative practices that can successfully reform and improve the existing system of higher education in Russia: Open Educational Resources, Shared Online Courses and Massive Open Online Courses. Gradually introduced into the educational process, they will help create a new effective learning environment.

1. Introduction

Higher education plays an important part in the life of any country as it provides this country with highly-qualified specialists for future development and progress. Nowadays higher education is facing a number of challenges: globalisation, an aging society, growing competition between higher educational institutions both nationally and internationally, and rapid technological development. Standards of living are steadily changing in Russia as well and this means that the kind of education, which was good enough twenty years ago, is not necessarily good today. This means that styles of teaching, quality of learning materials and university education management have to be continuously brought up-to-date and improved.

One of the important issues which has to be settled in Russia is developing connections between universities and business by means of implementing new technologies in education. The curriculum of most institutions still focuses on acquiring skills needed to become a researcher or a scholar. What is even worse, most university teachers have no practical experience other than research (and teaching). The vast majority of graduates, however, do not plan to become researchers, nor would they ever become scholars. What they really need is adequate training, real-world experience and practical knowledge.

We believe that only a balanced combination of well-designed, standardised and evidence-based professional university education with implementation of Open Educational Resources (OER) together with Shared Online Courses (SOC) and Massive Open Online Courses (MOOCs) can provide a solution to the problems mentioned above. This project can be referred to as “Creating Virtual Learning Environment (VLE)”.

2. Project

The time has come to reimagine education. The current pedagogical approaches are insufficient for preparing students pursuing higher education globally as well as the type of leaders, entrepreneurs, and thinkers that we need for the future. The rising cost of traditional education is another reason for change. So are the enormous advances in technology that allow the customization of education to individual learning styles, group learning, online interactivity, gaming and real-time employer projects.

There are three innovative practices that can successfully reform and improve the existing system of higher education in Russia if properly introduced.

2.1. Open Educational Resources

First of all, it is Open Educational Resources: digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research. The learning content at issue is open courseware, i.e. educational material organised as courses and typically distributed as PDF files, as well as smaller chunks of learning, often referred to as learning objects. There is a rapid expansion in the number of OER projects and the institutions involved so far seem to be well-reputed internationally or in their countries. OER projects expand access to learning for everyone but most of all for non-traditional groups of students and
thus widen participation in higher education. They can be an efficient way of promoting lifelong learning for both the individual and the government. They can bridge the gap between non-formal, informal and formal learning. OER is itself a challenge, but may also become a sound strategy for individual institutions to reimage.

2.2 Shared Online Courses

Shared Online Courses are high-quality online courses and learning modules that are broadly available for sharing across multiple institutions. In April 2015, 8 leading universities of Russia established the National Open Education Platform Association to develop an eLearning platform. The platform, used for publishing online courses created by the members of the Association, facilitates the adoption of international standards, formulates its own requirements concerning the quality of online courses and collaborates with providers of higher educational programmes, which are implemented using online courses hosted on the platform. Each course undergoes an internal expertise at a university, and a review by the Association to ensure compliance with the “Requirements and Recommendations for Online Courses on the National Open Education Platform”, co-developed by members of the Association. Upon successful completion of the course, learners get a course certificate, and credits for the course can be counted towards the students’ curriculum at any university in Russia. In the future students will be able to master a major part of their university programme online by taking courses on this platform. Since the teacher’s role as supplier of reading lists and teaching materials is diminishing, SOCs are likely to accelerate changes in the traditional teaching role and the evolution of more independent learners. Still now the choice of courses on the platform is limited.

2.3 Massive Open Online Courses

In 2011, the respective roles of higher education institutions and students worldwide were brought into question by the rise of the Massive Open Online Courses. MOOCs are freely available, accessible and contain materials that are cleared for use in any educational or personal context. They offer university-level courses without the need to complete an entire programme. They are ideal for unsupervised activities and other universities can select courses from any institution offering them to their students. There are very few face-to-face courses that include the flexibility of online access to lecture materials and recordings. The problem here is that content from a MOOC offered by a university outside your students’ home country may not match cultural and other conditions with which they are familiar. On the other hand, at a national level, MOOCs represents a further blurring of the borders between formal and informal learning, and universities are recommended to study how MOOCs can be efficiently used to meet some of the demand for increased lifelong learning.

3. Conclusion

The current challenges facing traditional higher education, including higher tuition, budget cuts, and the gap between theoretical and practical training, have caused many universities to search for alternatives. Thus, online learning environments have come to the forefront of higher education. The options we choose are implementation of Open Educational Resources, Shared Online Courses and Massive Open Online Courses into the educational process. Still these new resources should be introduced gradually, while maintaining proper balance between introducing them and traditional education. Only on this condition will we create a new effective learning environment and increase students satisfaction, better management of intellectual property, and community building.

4. References


Post-Graduate Mentoring: Critical Benefits for Practitioners and Higher Education Alike

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Abstract

This paper provides a conceptual overview, coupled with insights drawn from a case-study vantage point. It represents a combined higher education and K-12 research effort ultimately pointing to benefits of extended collaboration beyond graduation. It represents an important attempt to further support new administrators at a point in time when the role of educational leader is only growing in complexity and training programs are adjusting to new accountability requirements of their own. This paper is based upon the current realities found within the United States, and advances recommendations that could effectively augment the most popular efforts currently employed to support novice leadership at building and organizational levels.

1. Introduction

All around the world, education is experiencing exponential changes in technologies and expectations, and in many settings being concomitantly publicly scrutinized for its perceived mishandling of its own affairs according to Hughes [1]. Originating from these developments, educational administrators are facing increasingly diverse challenges from stakeholders representing every corner of society. To counter these affronts, various remedies to meeting increased expectations have been advanced around the globe depending on perceived need, prevailing philosophies, and current opportunities.

In the United States, following a business strategy has long been the en vogue way to “fix” schools, and consequently the utilization of large corporation strategy and planning techniques along the lines of transformative scenario planning [2] meets with approval from some. A vastly more familiar approach to preparing for future problems is standard strategic planning as described and advocated by Bryson [3] and others.

In contrast to the “business beats all” approach, there are those more in tune with a different path to improving education, including Petersen [4] that look toward more of a “people oriented” solution to overcoming long-term problems. In keeping with an approach advocated by Hughes that emphasizes people as the critical difference maker [5] there is growing support for ongoing post-graduate professional development [6] that is in tune with unique adult learner needs [7] and addresses “in field” demands and challenges as they present themselves.

The concepts being forwarded in this article appreciate and embrace a wide variety of viewpoints, including the popular structural functional approaches and “fixes” that are believed to mirror business success. That said, in looking at the complexity of the challenges faced by school administrators, the authors find favor with, and have gravitated more so toward a humanistic approach to developing capacity within schools and their leaders. Following added description of the complexities faced in today’s educational world, additional detail will be offered concerning the approach being advanced in this article.

In the United States, in the eyes of the authors, one of the most troubling challenges faced by today’s administrators has to do with the multi-leveled limitations propagated by government-imposed mandates. The obvious concern witnessed and voiced by most relates to the immediate and specific mandates themselves, with criticisms usually centering on affected teaching time and limited financial resources. Less obvious to many would be the negative effect mandates appear to have on long-term administrative efforts. Whereas the curriculums in American graduate leadership programs are still founded upon leadership-centered ideals, daily external expectations for practitioners are increasingly backing administrators into much more of a compliance orientation. New administrators are more so then commonly being schooled on leadership concepts for jobs that increasingly expect them to function more like managers than the leaders they set out to be according to work by Mouw and Hughes who looked at critical first undertakings faced by new administrators and how mentoring helped them lead in a world expecting a management approach [8].
It is not within the scope of this paper to detour into an inquisition concerning the perceived differences between leadership and management ideals. Rather, the focus of this presentation is intended to begin by articulating the changing conditions American administrators more commonly find themselves contending with at the onset of their careers. Contributing to the complexity of these challenges would be changes that are finding their way into higher education corridors. Following this, drawing upon both conceptual considerations in addition to novice professional administrator insights harvested via case study, the centerpiece of this proposition advances the benefits of mentoring efforts both as currently commonly exercised - - along with lesser considered variations that have also demonstrated high levels of merit in local situations.

2. K-12 Conditions

As already stated, in the United States K-12 institutions are increasingly being controlled and even more recently monopolized by a social and political structure that creates what has been viewed and described by Hughes as a dominated captive state for schools and their leaders [9]. External forces targeting schools go well beyond their governing boards and community members. Additional forces include the federal government, state government, state educational agencies, professional agencies and assorted think tanks. This domination has a well-documented origin and very visible lineage, as every active educator knows about the effects of the “cold war” and the resulting increased emphasis on science and math skills going back over fifty years ago. This event, along with subsequent important supporting legislation, paved the way to creating the “compliance model” for public education in America.

It is becoming clearer and clearer to those in charge of educational facilities that the locus of control for local decision making continues to be removed from their authority, and subsequent reflection reveals how this very development is starting to redefine the very concept of local leadership. The dominated educational system in the United States is a worthy topic of study, and though it is not the topic of this project, introducing it does help establish understanding of a condition that presents significant struggle to both the daily and long-term direction K-12 schools and their leaders take. Though actual daily decision-making will come back into question later on, the next significant detail to be considered has to do with conditions in graduate level training programs, and the manner wherein higher education attempts to address the development of school administrators in advance of the very challenging times just described. The purpose of the next section is not to fault higher education, but rather to illustrate some of the changes that have ultimately started to alter the conditions recent administrative trainees have had to start their careers under.

3. Higher Ed Conditions

While K-12 education in the United States can trace visible origins of domination back to the 1950s, for decades American higher education largely continued to operate relatively unscathed from those same initial controls that have been imposed upon the earlier grade levels. At a time when the challenges facing school administrators have never been greater, the higher education preparatory programs themselves tasked with guiding their development have faced challenges and changes that they are not accustomed to having to address [10]. While it would be tempting to summarize the challenges as essentially being the same as those experienced in K-12, and leave it at that, there is reason to make more specific note of the recent changes as they are affecting the instructional delivery from the very programs that exist to prepare education’s leaders to meet challenges both today and tomorrow.

Unpopular as it may be in the corridors of higher education, accountability that was at one time only talked about intellectually as a hindrance to be avoided at all costs, has now become a growing way of life in this proud societal institution. The University of Wisconsin, once considered the bedrock of intellectual freedom in America, has recently been fenced in by state government, and seen significant realignment of its priorities and many of its practices in a matter of months. Though there are many examples of increased accountability efforts, the net result appears to be one wherein leadership programs must decide first and foremost between meeting external national accreditations standards, or perhaps choosing to address expectations created by governing bodies including boards of regents of various states. The critical point here is that much as has long been the case with K-12 schools, at the end of the day, starting with the end in mind means pleasing an external master that is very much removed from the day-to-day activities and understandings. Basing decisions and priorities on events taking place in the field is becoming less and less of a priority at all levels in education in the United States.

As if accountability hasn’t changed the preparatory programs enough, a growing number of American
educational leadership programs have actually reduced their overall graduation requirements, often by at least a class or two. While working certainly at least to appease accreditation boards by cross-listing expected benchmarks, standards or competencies, students completing the programs are required to complete less training than they had to at a point in time when things were agreed to be far less complex. Though appealing because completion now comes more swiftly, developments like these may have more to do with recruitment and retention of students than completeness of administrator preparation.

The advent of online learning has only fueled this development, as programs are now competing nationally, and perhaps internationally for many of the same students. Market driven thinking has replaced decision-making that at least appeared to center on best practice and providing a completely viable preparatory program determined locally by the faculty. Further, the very instruction and competencies brought forth by these programs have also changed. No one disagrees that the programs are more convenient now. And while there is ample effort, data and literature to argue that the online programs by design are robust, experiences from both the instructional and the student end confirm that these more convenient programs and courses are often in fact still lacking much of the integration and interrelation that traditionally face-to-face courses had. One argument that is offered in defense of new practices lacking “face time” is that they increasingly utilize adjuncts who are current in their fields. The impacts of adjuncts will be considered next.

There is no denying there are wonderful adjunct faculty members in leadership programs, and to be found elsewhere within higher education. More concerning, perhaps, is the economics that are driving the increased percentage of adjunct faculty as compared to permanent faculty, whether they be at the instructor, clinical, or tenure track levels. While it is perhaps favorably argued that sharing outside practical experience is enhanced through adjuncts, these members do not make the same investment in the growth and sustainability of the training program that full-time faculty make. Yet they are often becoming the clear majority of the faculty make up. Sadly, a higher percentage of part-time faculty not invested in program development leaves less competition for the compliance oriented viewpoints, and practices that were brought out at the start of this section. Even assuming that adjuncts are every bit as good as full time faculty instructionally, they do not fulfill program, scholarship or service duties, and thereby leave the institution as a whole in a greater deficit or need than it proved to be a decade ago.

As reduced course requirements, less invested faculty roles, and increases in leanings towards addressing compliance requirements have been brought forth, it would appear as though today’s graduates really are starting out with less. Such a wrinkle would leave schools either with the reality of accepting what they have, and hopefully seeing immediate growth, or acknowledging there may be initial continuing needs, and finding a way to address them before they have a chance to become problematic.

4. Research Descriptors

The purpose in reviewing the current K-12 and Higher Education situations was essentially to introduce the nature and the scope of changing conditions that make evident a need for additional resources for novice school administrators. Rather than further exploring the motivations and dynamics behind these changes, it has always been the intent of this body of research and this paper to present worthwhile options that might help to alleviate some of the concerns resulting from these challenging K-12 and Higher Education conditions. This paper is both conceptual, and also represents case study insights derived from the actual working experiences of a recent educational leadership program graduate who successfully completed her first year in administration in Washington. The insights shared and explored here represent the primary focus of this project, and start out with a review of the general philosophy behind new administrator mentoring. Prior to getting in to the heart of mentoring, it is important to provide some information on the approach taken to this case study work.

Information concerning why the university mentoring relationship was initiated will be expanded upon later. However, from a methodological standpoint, it is appropriate to point out now that some of the very barriers that actually inhibited these mentoring efforts, ultimately assisted quite nicely in data collection efforts. For the more local interactions, the novice administrator had access to her own calendar, emails, text messages, and notes that she took while interacting with her team of mentors. As communication with the university mentor was limited by a distance of some 1,000 miles, it was basically completely done electronically. With the exception of three Skype sessions to clarify concepts already discussed through other electronic means, all communication was either by way of email or text. All of the information that pertained to this study was kept and organized for later review and comparison to artifacts and interactions that took place locally with
formally assigned mentors. Both investigators had access to all of the data, which was useful for supplementing perceptions that had developed during the course of interacting within the new administrator’s first year. As could be expected, with the shift to the case study focus, the voice of this paper will change at least a bit. This shift is intended to best communicate the information obtained through the case study efforts.

5. New Administrator Mentoring

Mentoring in itself, in education, and specifically for new administrators is not a new concept. However, considering the increased complexity and challenges faced by novice administrators, it has never been more important than it is now. Within the approach is all of the benefit espoused by experts on continuing professional development [11] and the value of field relevant reflection [12]. It has unmatched potential value if approached within framework advanced by Pedersen [13], which takes a more long-term holistic approach to continuing professional development.

For purposes of this project, mentoring is considered to be a relationship that is either formally or informally established. It is a relationship where someone with greater administrative experience than the novice, agrees to support that new administrator for an extended period of time. There is more to mentoring than the conditions just expressed. However, there are typically differences in the specific operational contexts enjoyed in various mentoring relationships. So we have opted to go with a simpler definition as it appears to us to cover a wider array of potentially beneficial relationships. For purposes of further discussion on this topic, we will consider new administrator mentoring from the context experienced by a new school administrator in the state of Washington. The following information is intended to be descriptive, more so than technical, in order to give rich insights into the benefits of mentoring rather than focusing on terminology.

The criteria found here represent the best-intended response to escalating challenges, national standards and the complex set of realities faced by new administrators. The construct and criteria found here represent inspiration from the efforts of the Association of Washington School Principals [14], and have not come from any level of government, national council on education, or university. The construct is viewed to be very workable, highly beneficial, and able to be replicated successfully across a variety of professional work settings. It was hugely beneficial for the new administrator who is a partner in this research topic.

6. Formal Mentoring Relationships

Resulting from both the AWSP construct and the personal reality faced by the new administrator, a combination of formal mentoring relationships was established. One mentoring situation was set up with another elementary principal who works in the same school district. She has been an administrator in the same district for 3 years. Another formal mentoring relationship was also established. This one was considered to be an “outside” mentoring relationship with a consultant who contracted with the school district to provide mentoring services to the novice administrator. This mentor has 20 years of experience as an educator, administrator and consultant. Both mentoring relationships were established, formally, following the AWSP construct, for the 2015-2016 academic year, which was the novice administrator’s first year as an elementary principal for the Oak Harbor School District in Oak Harbor, Washington.

Looking back at a year of formal AWSP sanctioned mentoring provided both expected and somewhat more involved insights. At the surface level, the internal mentor proved very functional for developing an understanding of day-to-day happenings in the role of the principal, and in terms of interactions across the district. The internal mentor was great at introducing the novice administrator to the system. She knew the politics and the way things had worked in the role and in the district. The internal mentor also regularly offered encouragement and support. Those are certainly worthwhile outcomes and consistent with experiences in other places, and with other mentoring relationships.

The external mentor represents a less common relationship than the traditional internal mentor role takes on. This role and relationship was defined up front and the early discussion or negotiation centered on the novice administrator’s building and professional goals. The purpose of this relationship, and the outcome being highly successful as well, was to articulate areas of growth and ways to plan to meet those expectations. This relationship was so valuable to the novice, that she formally requested the relationship to continue for an additional year so work might begin in more depth on matters such as updating the vision and mission statements for the school. Finally, not to lose sight of this important quality, in this more unique role and relationship, and really because of the person filling the role more so than by definition, the novice felt supported and found some ability to zero in on specific matters taking place in her building. Unfortunately, the outside person had other
obligations and was not always available for consultation on day-to-day matters that could arise.

7. Informal Supports

In smaller isolated settings, the role of the mentor as formally defined and established is so critical. It may really provide the novice with their only line of support. Even in situations where there is formal mentoring in place initially, it is the supportive relationships among co-workers that will help sustain a leader willing to put themselves out on a limb and make necessary change year in and year out. In the district that was the focus of this case study, there were multiple instances where strong working relationships blossomed into friendships that actually have the potential to fill this ongoing need. These important supports were not formally defined but were highly valuable for social reasons as well as for the opportunity to provide a sounding board for the novice administrator’s challenges and ideas. In addition to these informal resources, past relationships with former educators that had moved on to administration and even contact with other members of the professional association all provided similar encouragements and supports. Though these contacts and supports are not formally identified, defined, have articulated roles, and though their impacts tend to be more along the lines of encouragements and networking, they are highly valuable and the novice administrator did not feel as though she could have succeeded in her first year were she to have worked in isolation, as can be the case in smaller more remote settings.

8. Expanded University Mentoring

Despite all the incredible formal resources she was utilizing, there was still the lingering question how the new leader was going to avoid losing sight of who she was, keeping in touch with her already established beliefs and very personal leadership style. In her final class, the culminating course on the principalship, everyone in her cohort commented regularly on seeing people lose track of who they were as a teacher as soon as they left the classroom, and found it extremely troubling. Now, even at the start of the school year, the novice administrator found herself looking in new directions and at risk of losing sight of who she was. Alarmed by this, she decided she was not ready to give up on the person or the qualities and skills that got her to her new role in the first place.

Her thoughts took her back to her final course on the principalship, and some of the class discussions about who everyone thought they were meant to be. She could not go back to that setting, but she contacted her former professor and referenced a moment where he had offered to help any former student even after they had completed his course and their program. That offer was what she referenced when she asked if it might be possible to informally bounce things off of him as she started her first year in administration. With only a friendly commitment expressed on both parts, not even a handshake because of 1,000 miles separating them, it was agreed that the mentoring focus for the year would be the types of things it took to stay true to who she set out to be. Further, it was agreed that this advice would complement the planned formal mentoring instead of competing with it. Outcomes from this mentoring relationship will be considered next, alongside the benefits described from the more formal mentoring efforts.

9. Benefits All The Way Around

The focus of this section is on the benefits enjoyed from the mentoring relationships described in this paper. The benefits will be considered from the viewpoint of the new practitioner, with the exception of multiple significant benefits realized for the university, which represents a different point of view. As those benefits are unique in perspective, they will be considered first prior to the practitioner benefits. The beauty of these “return” benefits for the university is that the mentoring described here has already benefitted the new administrator from the program, but the insights being exchanged between mentor and mentee will benefit future graduate students as well. That is because in “real time” the professor has at least weekly knowledge of the major issues the new administrator needed help with. There is opportunity to help her, now, and insight that can help refine delivery of instruction for future students. Interestingly, there were two areas of focus that stood out all year long. Knowing that the administrator needed more assistance with conflict resolution and special education dealings really actually came as no surprise. It was believed even during the principalship course that students completing pretty much any program would be lacking in these areas. That it was confirmed, strengthened the professor’s resolve to put increased emphasis on these concepts – NOW – for current students’ benefit.

Looking more to the practitioner side of things, the primary focus of the mentoring, reveals several expected and perhaps even a couple unexpected developments. First and foremost, all of the efforts described within this paper were valued and found to be extremely beneficial by the new administrator. The
formal internal mentor provided orientation, a valued
sounding board, and advocacy for the new
administrator right from the start. The formal external
mentor, as mentioned, was in sync not only with
planning and goal setting “system level” efforts, but
also proved to be a personal resource, and was as well
found to be a strong advocate for the new
administrator. Truly these resources, along with
colleagues, friends, and family members were all vital
contributors to first year success. Especially important,
though not mentioned to this point would be the
support of upper administration that originally
provided the resources, and ultimately provided
feedback in a manner that was meaningful to the new
hire, and also again, supported her efforts to attempt to
go beyond first year expectations. It says a lot when
busy top-level administrators like the superintendent
or the assistant superintendent will attend workshops on
reading at the suggestion of a first year administrator.
Or they will allow her to run with a different approach
to dealing with conflict in her building, as this
administrator did.

The university oriented mentoring is just one piece
in the support system for the administrator in this
vignette. However, it is perhaps the least common, and
likely the most individualized or most “personal” in
that regard as she was looking for someone to help
guide her thinking and to process challenges, and
support her continued growth in these reflective areas.
In the eyes of the new administrator, she benefitted
going into the year by being able to utilize some of the
activities from her principalship class. The course
helped her to develop most of her start of the year
approaches and communication efforts. Once the year
had started, it became useful to build upon those
learned lessons, but be able to talk through next steps
with her professor-mentor. Special education issues,
and conflict were repeated topics that were discussed.
Understanding some of the complexities of human
resources situations helped her to better appreciate why
some sensitive matters were not addressed as openly as
she might have expected. She got practice preparing
for “hard conversations” that she really could have
gotten anywhere. And to some extent she did. But this
mentoring relationship was where she got to build on
who she set out to be, and felt safe in questioning how
all of that effort to “do it her way” was turning out.

In the words of the mentee, it is isolating to lead an
elementary building in that there really are no
assistants at an administrative level to build into a
team. There really isn’t, then, the defined “team”
approach that is found at the middle and upper levels in
a K12 system. As she pointed out more than once,
case studies in classes are fine, but it was so much
to better to be able to bounce her thoughts of a trusted
advisor who had experience, understood her, and as it
happened demonstrated an approach to leadership that
was very much in sync with who she had always set
out to be. As she said herself, sometimes it felt like
she was going through her principalship class all over
again. Having similar discussions to those that took
place there were refreshing. Except now, the issues
were real, they were hers. Sometimes issues were huge,
and the attention in the conversation was one hundred
percent directed towards her. This style of mentoring
provided an opportunity to continue to learn how to
think, focus and approach issues now and down the
road. It was no more significant to her success in her
first year than any of the other resources. It was,
however, a bit more customized and “real time” than
anything she had ever experienced before.

10. Conclusion

This project was undertaken as result of a unique
mentoring arrangement that has just been described. It
is a situation where a course lead to a mentoring
relationship for a first year leader, that is now heading
into preparation for continued advanced studies, at a
Ph.D. level. This research and this paper literally ties
into all of the above. At this point, focused insights are
being offered as opposed to listing recommendations.
As another student [15] reminded the authors recently,
not every professor would offer this assistance, nor
would every leader be so open to the kind of feedback
this recent graduate worked with. She is exceptional in
her ability to integrate ideas and draw meaning from all
of the resources she works with. That is a unique
talent and requires an openness that not everyone has
for new ideas as well. On top of this, it is not practical
to expect what took place here to become the latest
expectation placed on faculty or written into some
accountability piece down the road. Therefore, insights
as opposed to “recommendations.”

This university mentoring relationship was unique
in many ways. One of them is that the mentor is a
former superintendent, who has human resources and
special education, as well as legal background, having
served also as a director of special education and a
school psychologist. Further, in his current role, he
teaches not only the principalship, but also teachers
masters level and doctoral level educational law. The
point here is that in terms of vision, views on
leadership, sense of commitment, and even background
experiences, he had pretty much exactly what she was
looking for. This story is meant to show that
something like this is possible. It is a win-win-win
opportunity in how it benefits the practitioner, provides
insights back to the faculty member and the university,
and finally, if the contact hours were clocked, could count significantly towards faculty “service” requirements that would also help to fortify the relationship between training institution and the K-12 setting. It is an option. Not a blanket solution. It is an option that a new administrator sought out, and feels she benefitted tremendously from.

11. References


Session 3: Global Issues in Education and Research

Eportfolio Implementation in a Multiple Campus University Environment 5 – Faculty Engagement at Australian Catholic University (Authors: Marie B. Fisher, Andrew J. Hill)

On Selected Aspects of the Funding of Universities in Russia and Abroad (Authors: Petr Umnov, Dmitry Kondratyev)

Cultivating Global Citizenship in Higher Education (Author: Paul D. Sherman)
Eportfolio Implementation in a Multiple Campus University Environment
5 – Faculty Engagement at Australian Catholic University

Marie B. Fisher, Andrew J. Hill
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Abstract

At the Australian Catholic University (ACU) an ePortfolio may be used as a product, to display parts of one’s Personal Learning Environment (PLE), or as a process, referred to as a Personal Learning Network (PLN). This is challenging to institutions and their Executive, as academics can use it both as an assessment ‘of’ learning and as a vehicle ‘for’ learning. It promotes metacognitive awareness of learning (awareness of one’s own thinking and problem solving) providing opportunities for self-directed learning by exploiting its digital affordances, enabling users to reflect upon, profile, and transform learning, teaching, and engagement with peers in one’s profession [1]. Reflection is an essential part of academic learning and continuous improvement. In Teacher Education courses, community reflective practice [2] helps profile evidence used to show continuing achievement against professional teaching standards in an evolving life-long learning journey.

1. Introduction

The aim of this paper is to outline the challenges that continue to hinder ePortfolio implementation with an integrated technology and evidence based pedagogy, and to share the strategies we used to overcome these obstacles (based on our own observations and reflection). Secondly, as one recognises the benefits of the transformative learning affordances of a PLE and PLN, it is hoped that there is scope to improve the implementation, promotion and adoption of ePortfolios across the Higher Education sector by sharing our journey and seeking feedback on our experiences from the global community.

The Executive at our University are faced with a significant set of challenges when encouraging adoption and integration of the ePortfolio tool, Mahara. An institutional approach to administering e-learning tools like ePortfolio is preferable to allay suspicion about their value by some academics and increase uptake for PLE/PLN purposes.

2. Literature Review

Time poor academics, varying degrees of digital literacy [3], [4] resistance amongst influential members of the academic community and provision of a skills deficit based ‘training’ model [5] for professional development are hurdles that the academic community need to overcome. In a multiple campus environment, showing how a PLE and PLN helps students demonstrate the connection and nexus between university teaching, pedagogy and teacher competency, in professional experience components of their units of study, would be a way forward to increase adoption and implementation [5].

To encourage academic staff in different faculties, in a multiple campus university environment to collaborate as well as integrate technology tools with learning and teaching pursuits it is important to:

a) Scaffold instructions;

b) Encourage modelling by homophilous ‘opinion leaders’, as identified by diffusion research, to provide exemplars that build confidence and capability;

c) Determine strategic approaches and activities to encourage uptake and engage not only in their own personal learning environment but in their personal and extended learning networks so they realise ‘what’s in it for me?’

d) Trial different approaches (template designs, group submissions) to learn how they interact as well as meet, or do not meet intended learning outcomes.

Academics are more likely to persevere with integrating eportfolios to help them provide excellent learning and teaching experiences for their students, by involving students in their learning designs [6] as well as their colleagues, to accommodate collecting, profiling and sharing evidence of professional practice. [7]

3. ACU Structure

The Australian Catholic University was established in 1991 following the consolidation of four tertiary institutions in Eastern Australia. There are 7 domestic campuses in 4 states, New South Wales (NSW), Queensland (QLD), Victoria (VIC), South Australia (SA), and 1 territory, Australian Capital Territory (ACT). [4] An additional international campus, a joint venture with the
Catholic University of America, was opened in Rome in September 2015. The University emerged from vocationally oriented colleges established by clergy from a number of Catholic religious orders eg teachers and nurses.

The larger campuses situated in major cities in Sydney, Melbourne and Brisbane, are managed by 3 Associate Vice Chancellors. Ballarat and Canberra campuses are led by a Campus Dean. Most campuses teach undergraduate and postgraduate courses in the 4 faculties: Education & Arts, Health Sciences, Law & Business, and Theology & Philosophy. Each State or Territory has their own legislation and requirements for professions in Law & Business, Education, Nursing, Paramedicine, Psychology, Physiotherapy and Social Work making the issue of uniformity with learning tools like ePortfolios problematic [4].

In addition, people located in various jurisdictions in Australia such as New South Wales (NSW) have a different culture or approach to accreditation to say Queensland (QLD). This is due to different structures and priorities in the formation of regulatory or professional accreditation boards. Therefore, state based differences considered as dominated by larger city ‘cliques’ can become a barrier to sharing, collaboration or developing a more streamlined approach to accreditation in Teacher Education as well as Nursing, Law and similar professions [4].

Based upon the authors’ own experience and observations, a ‘centralised’ approach to change that has been unsuccessful (namely the design, development and implementation of national templates from the Learning Management System (LMS)) have done so because they do not address the different contexts upon which they are imposed, include a variety of assessment instruments and accommodate student learning styles [7].

4. Curriculum Changes for Teacher Education

Teacher training, quality teaching and professional teaching standards in Australia came under the spotlight again in recent years due to extra work imposed upon them or lack the necessary digital literacy. This may result in some staff being reticent to engage pedagogy with technology in new ways to achieve learning outcomes [3].

In addition, in a multiple campus environment with diverse cultural differences across the campuses there may be a perception that only one or two campuses have ‘any say’ in how these changes are marketed to staff and implemented consistently utilising technology [4].

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As a result, the senior academic staff, faculty and University administration become frustrated with the perceived lack enthusiasm or in some cases resistance to adoption and integration of University supported technologies. The observation that academic teachers find the design of ePortfolios problematic has been supported by recent research conducted by Silva et al, 2015, who raise the significant issue that it is time to involve students who are also stakeholders in ePortfolios including their Personal Learning Environment (PLE) [7].

So the question remains – how should our University assist academic teachers transform their learning, teaching and adoption or integration of this
technology and at the same time involve key stakeholders, their students?

6. Case Study – Faculty of Education and Arts Workshop 1

The Case study that will be presented is included to show the considerable benefits of ePortfolios for profiling professional experience (developing PLEs and professional networks) acquired during practicum in schools, community engagement and through university study. Using ePortfolios in this way may seem simple enough for students provided that they are involved in the development:

a) Demonstrate through reflection and acquiring evidence of professional practice how their experiences transformed their knowledge, skills, attributes;
b) support their learning points with relevant literature and modelling;
c) adopt strategies to profile this evidence (integrating pedagogy with technology) in Mahara. Mahara is the ePortfolio hosting tool supported by ACU and, at the time of writing, by most professional standards accrediting bodies.

To accommodate the changes to requirements for professional standards for teachers the authors were approached by the National School of Education in the Faculty of Education and Arts (FEA) for assistance in developing an ePortfolio workshop in collaboration with the faculty executive that would begin the journey of developing a (PLE/N) by creating opportunities or affordances to:

a) Explore with participants how a reflective process could be scaffolded with students;
b) Develop an assessment rubric in consultation with participants;
c) Investigate ePortfolio template(s);
d) Explore peer learning in self-managed groups;
e) Design a Community of Practice model for diffusion of ideas, experience and collaboration when implementing ePortfolio across the Education curriculum [10].

Design and development of this workshop took more time than anticipated as it had to be negotiated between at least two senior executives as well as incorporate input from academic teachers who communicated mixed feelings about the changes to their units.

The authors observed that some people were enthusiastic about integrating the same University supported ePortfolio hosting system for all units required to have a professional experience component encouraging PLE [5]. Other academic teachers, with considerable influence on their peers, for historical reasons, were not keen to change their practice [10]. It was evident to the authors that to change behaviour, motivation, increase adoption and improve practice, an enthusiastic academic who had learned how to use the hosting system effectively and modelled this with his students would have more chance of influencing those resistant to change to become adopters [10].

The workshop commenced with an address from the Executive Dean explaining that support and assistance would be available to this group to enable them to help their peers. She further explained why these ‘experts’ had been gathered together to develop a unified approach to integrating professional experience into three Education units initially. The perception of the authors was that her approach was aimed at:

a) a means to achieving institutional change and b) streamlining ‘individual’ academic work [7].

A generic approach to developing rubrics for marking or accrediting was necessary to reduce duplication of rubrics, assessment instruments and dispense with unnecessary administration and provide a benchmark for new academic staff who may be less experienced than this group. [11]. A common template, with minor alterations, can only be supported by the National (centrally located) Learning and Teaching Centre at ACU.

Wherever Times is specified, Times Roman or Times New Roman may be used. If neither is available on your word processor, please use the font closest in appearance to Times. Avoid using bit-mapped fonts if possible. True-Type 1 fonts are preferred.

7. Transforming Learning and Teaching Approaches: Explored

The main transformative learning approach used in developing student ePortfolios at ACU in the Education and Health Sciences faculties is reflective practice [4].

At ACU Education and Health Sciences academics and students continue to be active users for accreditation of teachers, nurses and paramedics [2], [3].

A simple reflective practice can be used to encourage metacognitive awareness by:

a) Identifying what is working well? What learning strategies employed produced good results?
b) What needs changing? If my learning outcomes were poor, what other strategies could I use to improve my practice?
c) What are we learning? How can I ‘transfer’ my prior learning into this context?
d) Where do we go from here? How do I reassess and adjust my goals [2]? This approach could help reluctant staff take the first steps to profile their own experience for a particular purpose such as promotion or fulfilling probation requirements.
Although academic staff report informally that they are committed to their own learning through self-reflection there are still hurdles they need to overcome. The authors have observed through facilitation of workshops and other project work that the reality is that many academics are or perceive they are ‘bogged down’ with being time poor, concerned about lack of recognition and, despite their keenness to improve and contribute to excellence in teaching, want to know: What is in it for me [10]? So influencing a change in behaviour or resistance to participation in collaborative ventures will only occur when there are ‘opinion leaders’, given real incentives, who are able to diffuse ideas, and gather feedback from in schools located in faculties.

8. Community of Practice – (SoLT approaches)

The authors seek to ask questions about how faculty academics as well as students learn, note observational evidence showing affordances as well as barriers to new approaches to learning and teaching. It is expected that by sharing this knowledge with our domestic and international colleagues we are able to help others develop new approaches to practices in teaching, learning and curriculum. [12].

The ACU ePortfolio model of Communities of practice (CoPs) will be a challenge for the faculties in a number of ways.

Firstly the schools in the faculties on a particular campus may not be able to identify clearly what they need help with due in part to the rapidly changing university environment. The authors noted that CoPs define and develop themselves [10] but it is not clear how Academic Development units can facilitate external support [11].

Ownership as well as ‘what’s in it for me?’ needs to come from the schools in the faculties. In other words how will this benefit one’s practice, encourage collaboration and serve professional development needs? This may initially take the form of face to face meetings every two or three months, progressing to virtual meetings with larger groups and then considering what global self-organising events could be included to participate in wider opportunities for collaboration.

This process over time will help reinforce motivation and continuation to engage in learning, teaching and development when integrating pedagogical approaches with technology tools both individually, institutionally and globally [4], [10].

ACU needs to take a longitudinal approach to bringing academics from legitimate peripheral participants to self-directed communities [10]. It has been proposed to use both an institutional and a collective approach to empower academics, support ‘bottom up’ innovation and encourages continuous improvement.

9. Conclusion

The authors have observed through their teaching, facilitating and personal learning (PLEs and PLNs) that encouraging new ways of integrating pedagogy with technology tools, which may include collaboration with colleagues within and across faculties can be challenging for a number of reasons. Trust, academic support amongst peers and negotiation about key goals needs to be fostered through communities of practice to transform learning in stages within schools and faculties and become self-directed and managed after initial support to build these networks is established.

In addition, it is important that the Executive of our University are fully informed about operational as well as change management issues by faculties so they are able to make strategic decisions that will help academic teachers improve their digital literacy, engage in more collaborative learning and teaching and actively involve students in this journey. We acknowledge that it will not happen quickly. Therefore, we seek and would like to accommodate global feedback to improve our practice as well as help other universities across the world by sharing our own journey.

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On Selected Aspects of the Funding of Universities in Russia and Abroad

Petr Umnov, Dmitry Kondratyev

Innopolis University

Abstract

Long gone are the times when universities provided education only. Nowadays, they are much more than that. Higher education (HE) institutions are centers of research, investment houses, business collaborators as well innovation hubs. They employ thousands of faculty and staff members. In other words, they have become a multifunctional enterprise that needs huge amounts of money to lubricate its inner workings.

1. Introduction

Both authors – Petr Umnov and Dmitry Kondratyev – have come out of Innopolis University, which is the first Russian IT University, where they have served in the capacity of head of the Project Management Office and director, respectively. There, they have gained first-hand experience of the challenges that Russian institutions of higher learning face. So the authors are appropriately equipped to supply a thorough analysis to some them, giving an emphasis to funding issues, especially with respect to the financing of research. The authors provide comparison of how similar issues are dealt with in other countries, primarily in the USA, and follow up with their own recommendations.

2. Overview of Sources of Funding

2.1. Russia: the Background

The modern university, just like any other organization, needs a financial base. In the times of the Soviet Union, the state was the sole source of financing of higher education, which was free for the people. After Russia arrived on the scene following the collapse of the USSR in 1991, the situation changed. That period saw the emergence of the first private universities that brought with them new forms of financing, such as tuition fees, grants, subsidies, endowments, donations, etc. Figure 1 shows the plethora of funding sources presently in use; some of them comprise the bulk of the financing while others are just fledging.

![Figure 1. Sources of funding of Russian universities](image)

Note: It has to be noted that private universities get a limited amount of or no financing from the government budget.

In many countries, appropriations account for a major portion of the revenues of state-owned universities. In the case of Russia, experts split. Some of them believe that budget sources gave state universities 40% of their total revenue in the Aughties, but since then their share has increased to 60% [2]. Others, however, come up with a 50/50 split between budget and off-budget sources [9]. To give you an idea: non-budget sources account for 52% in the US, 38% in Great Britain, 39% in Canada, and 57% in Japan [14].

If we break down the off-budget sources, tuition fees will be the largest component. Thus, tuition fees at Saint Petersburg State University come out at 33.7% of the total revenue of the institution; that’s equivalent to 63.2% of the off-budget sources. The figures will be similar for other universities [12].

2.2. The US Case

On average, the US spends annually on education about 8% of GDP, that’s about USD 1.3 trillion. By the type of institution, universities fall into two broad
categories: private (59%) and public (state) (41%), including those founded by state and local authorities. Nevertheless, the majority of the student population (76%) gets higher education at public institutions \[11\]. According to 2008 data provided I.V. Abankina, public-university funding is distributed in the following fashion \[11\]:

![Figure 2. Funding of US public universities](image)

In contrast to public institutions, in private universities, the share of revenue generated by tuition money is considerably higher and that of federal appropriations – lower. Investment income also plays a greater role in private-owned schools. It also has to be noted that in state schools, too, the share of public-sector finding has recently diminished. In line with Abankina’s findings are data by Donna Desrochers of the Delta Cost Project from her 2011 research paper (see Figure 3) \[6\].

![Figure 3. Total revenues per full-time student, FY 2001-2011 in 2011 USD](image)
• Grants and subsidies for research and other projects;
• Aid to financially challenged students.

As we have mentioned above, of all non-appropriation sources, tuition is the most important. What’s more, at private institutions, it is growing at a faster rate than it is in public ones.

Another source of major significance is the endowment. Dating back to 1379, when the Winchester Cathedral set it up to support talented children from poor families [1], an endowment consists of a pool of donations to produce investment income. The capital that some of the leading US universities have amassed in their endowments amounts to tens of billions of dollars (e.g. Harvard University – USD 32.7 billion, 2013).

Universities also generate substantial income through a range of diverse activities:
• Rent of property;
• Maintenance of restaurants, cafeterias, stores and shops, etc.;
• Sale of logo-branded goods;
• Placing advertisements on campus;
• Hosting special events (alumni meetings, paid-for seminars, and the like), etc.

It’s worth noting that alumni relations are an important PR activity at universities, as those former graduates often donate money to the endowments.

3. Grants, Subsidies and Indirect Costs: the US vs. Russia

The authors will use the terms “grant” and “subsidy” interchangeably throughout the text, although we understand there is a certain difference between them in Russia. Thus, grants are provided before the recipient has borne an expense, while a subsidy is a reimbursement for an expense already incurred. As we have mentioned above, present-day universities do not merely provide education, but also function as research centers. The rationale behind this is that universities’ financial needs cannot be covered by tuition alone; this is why most universities strive to acquire research status. Many western universities have accumulated tremendous ‘brain capital’, which they successfully put to use in doing private and public-funded projects. Innopolis University, Russia, which the authors represent, is also intent on developing into a research center of international renown.

In the US, government funds account for the majority of subsidies provided to HE institutions. According to Martha Sale of the Florida Institute of Technology [7], the US government annually supplies $15 billion worth of grants. Grant amounts vary very widely from state to state. In some states, universities may receive only federal funds, while in others, state-level funding may be 1.2-1.3 times as much as federal [11]. Nationwide, a number of government agencies and bodies are involved in the provision of subsidies. Among them are the US National Science Foundation (aka NSF), NASA, the National Institute of Health (aka NIH), and others. A grant maker determines a competitive recipient, supplies funds, and ensures compliance with the rules and procedures.

As in all business undertakings, researchers incur expenses not directly attributable to any specific activity, such as accounting, legal, and administrative expenses, depreciation, insurance, rent, utilities, etc. Such expenses can be referred to as overhead, indirect costs or Facilities & Administration rate, aka F&A. This aspect deserves our in-depth analysis for, as it will be shown later, Russia needs to study and adopt western best practices to narrow the gap in university-level research output. The authors analyzed the gap in research output at length in their 2015 paper Engineering Education in Russia: Challenges [15].

We believe it makes sense to begin with analyzing the technique of arriving at the F&A in the US. So, the costs of a research can be broken down into direct costs and indirect costs, or

\[
\text{Total Project Costs} = \text{Total Direct Costs} + \text{Total Indirect Costs}.
\]

In most cases, US fund recipients use in their reporting a modified version of Total Direct Costs, i.e. Modified Total Direct Costs or MTDC. MTDC differs from TDC in that the former excludes equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, and certain other costs [4]. MTDC serves as the base to which F&A (indirect cost) rates are applied. The F&A rate is, thus, the relation of the F&A cost to MTDC or

\[
\text{F&A cost} = \text{MTDC base} \times \text{F&A rate}.
\]

The cornerstone of the US granting system is that the arrangements for institutional participation in the financing of a research or other projects are subject to negotiation between the proper cognizant agency and the institution concerned [4]. If a university waives negotiation, then it will automatically be subject to a 10% F&A rate, the principle called ‘de minimis’. In reality, all universities use their right to negotiate and end up a much higher rate.

Martha Sale, who we have referenced above, cites the following data:
As a rule, a cognizant authority sets the F&A at a certain level for a period of three years for all pieces of funding that a given institution receives, for it would take a prohibitive amount of work to pass judgement on a grant-by-grant basis. A number of factors drive different F&A rates applied to different institutions:

- Utilities and salary rates in a university’s location;
- State of buildings and other property that could need renovation or construction;
- Size of a university, i.e. smaller schools bear higher average overhead costs and, thus, need stronger support with a higher F&A.

Nevertheless, even such a seemingly effective system has its critics who feel that triennial negotiations with individual institutions are still too much work to do [8]. Alternatively, they suggest to group all universities according to the criteria listed above and assign to each group for a set period of time a certain F&A rate.

We think it would benefit our analysis to mention Canadian experience. Until recently, the system in Canada has been very much similar to that of the US. Then they have introduced dual grants, its essence being that at first an institution gets a grant, which is called a primary grant, that has no overhead in it at all. At the same time, the institution applies for a secondary grant that consists of the F&A alone.

Anyway, in both cases we see a specific treatment of the situation. One might wonder what happens to a university, whose F&A is too low. The answer is under-recovery [5]. Suppose a certain university has a pool of grants with the following dimensions:

\[
\text{MTDC} = \$200 \text{ million}, \quad \text{Indirect Costs} = \$100 \text{ million}, \quad \text{F&A} = 50\%.
\]

Then they take on another $2 million grant with no overhead, i.e. F&A=0. Their new F&A now decreases to 49.5% (100/202). This new rate allows them to recover only $99 million (200*0.495), and the remaining $1 million will have to come out of the university’s own funds, such as tuition or investment income, etc. It’s easy to imagine that constant under-recovery will result in universities’ dropping their research and that, in consequence, would force them to drive their tuition fees upward. This will, in turn, send a negative wave throughout the economy. To do justice to the situation, we should add that private grants usually have a much smaller F&A (10-20%) that, at times, can really lead to under-recovery. But as long as private funding accounts for a frugal portion of the fund pool, its effect is leveled off.

Now the authors would like to draw the reader’s attention to Russia’s practice. First, we’ll take a look at the methodology. In Russia, the overhead rate equals the relation of Total Indirect Costs to Total Project Cost or

Overhead rate = TIC/TC.

Since we don’t wish to compare apples with oranges, we have to adjust one technique for the other. According to NIH, the current F&A level (see Table 1) applied to MTDC would correspond to 26-28% applied to the TC base.

In Russia, all universities get subsidies at a flat overhead rate of 10% of Total Project Cost regardless of the type of university or any other circumstances. Graphically the comparison of Russia and the US would look like this:

![Figure 4. Overhead recovery, %](image)

It’s hard to escape the conclusion that Russian universities suffer from under-recovery, which results in insufficient amounts of in-house research, hence, the widening technological gap between Russia and the leading countries. Recently, Innopolis University has brought the situation to the attention of the Russian government. We have proposed a flexible approach, and an increase in overhead to 30%, 10% being ‘de minimis’, and another 20% to be negotiated with the Ministry of Science and Education. Our appeal is still in progress as of the time of the writing.

4. Endowments in Russia: the First Steps

Unlike the West, where endowments have been around for decades and even centuries, they are quite a new phenomenon in Russia as they came into existence only in 2006 [13]. Presently, they are only gaining momentum. Innopolis University, which does not have an endowment of its own, carried out
an analysis with Ernst & Young in 2014. It revealed that it would have taken an endowment of USD 213 million in funds to cover its operating expenses. As you can see from Table 2, it would have been the largest endowment in the country.

Table 2. Largest Endowments in Russia (2012) [3]

<table>
<thead>
<tr>
<th>Fund Owner</th>
<th>Amount in Endowment, in millions of USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urals, Charity Fund</td>
<td>185</td>
</tr>
<tr>
<td>Moscow State University</td>
<td>15.3</td>
</tr>
<tr>
<td>Saint Petersburg State University</td>
<td>11.6</td>
</tr>
<tr>
<td>European University of Saint Petersburg</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Note: The RUR/USD exchange rate is assumed to be 65:1.

As one can see from Figure 5, endowments in Russia have been growing in number, but that process is inhibited by the lack of expertise and elaborate laws, a superficial philanthropy culture, and a limited scope of financial instruments into which endowment funds are allowed to invest.

Figure 5. Endowments in Russia

Anyway, we expect endowments to play a much greater role as a source of financing down the road.

5. Conclusions

In conclusion, we should say that the modern university is an intricate mechanism that’s an integral part of society at large. To function smoothly, universities must have a diversified financial base, with a substantial portion of revenue coming from research projects.

It is the authors’ belief that the government should make its role in research funding more pronounced and implement a flexible system of awarding grants with variable overhead rates. The indirect cost rate must not be one-size-fits-all, but should take into account the specifics of universities. This would alleviate the issue of under-recovery and incentivize HE institutions to take on more research projects.

Innopolis University sees itself as part of the scene and as a player to be reckoned with. We believe we should maintain a dialog with the government and make it aware of the issues facing the universities and cooperate with it in developing the road map to a world-class education system.

6. References

Cultivating Global Citizenship in Higher Education

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Abstract

This paper reports findings from case study research on Soka education’s university setting in Japan. Building upon Reysen and Katzarska-Miller’s [17] paradigm theorizing antecedents and outcomes of global citizenship identification, this study explores how Soka University addresses global citizenship education, as seen through the various lenses of its administrators, faculty, and students. Data generated from semi-structured interviews and an on-line survey identifies Soka education as an educational philosophy and pedagogical practice that aligns with Reysen’s theoretical model relating antecedents and outcomes to global citizenship identification. The findings suggest that global citizenship identity is cultivated at Soka University Japan in the presence of a normative environment in which persons valued by the students endorse global citizenship, and in which global awareness is promoted. The research also suggests that the presence of global citizenship identification corresponds to an attendant endorsement of prosocial values and behaviours. These findings have potential implications for the implementation of global citizenship education programs in higher education.

1. Introduction

Global citizenship is often conceptualized as an appreciation for the worldwide interconnectedness of human beings, a respect for cultural diversity and human rights, a commitment to global social justice, a sensitivity to the suffering of people around the world, an ability to see the world as others see it, and a felt duty to take responsibility for one’s own actions and on behalf of others ([8], [11], [12], [13], [19]). Reysen and Katzarska-Miller [17] define global citizenship as, “awareness, caring, and embracing cultural diversity while promoting social justice and sustainability, coupled with a sense of responsibility to act”. Global citizenship has largely emerged as an attractive construct for campaigners of worldwide peace movements, as well as for advocates of human rights, environmental sustainability, and social justice issues [4]. Although global citizenship has been considered in academic settings since the 1950s, it has only been the subject of significant discourse in higher education over the past few decades [22]. Within the higher education sector, the current level of dialogue on this topic has largely been fueled by pressures on colleges and universities to implement global citizenship programming to help prepare students for globalization.

[3]. Stoner, Perry, Wadsworth, Stoner, and Tarrant [24] note that higher education has felt both internal and external demands to ensure students are able to “think and act globally in order to effectively address political, social, economic, and environmental problems on a global scale”. Spencer-Oatey and Dauber [23] observe that employers are now “seeking/demanding/expecting” their new employees to be “globally skilled”, also referred to as interculturally competent. A number of studies report that higher education has begun to realize the importance of engaging students in global citizenship curricula to be more globally informed, responsible, prepared, and competent ([2], [6], [9], [21]).

Higher education institutions worldwide are being looked upon as focal points for demonstrating leadership in cultivating intercultural competence and global citizenship ([5], [14], [21], [25]). The basis for engaging students in global citizenship education is premised on the belief that when students are educated to be interculturally informed, responsible, and competent, they will possess the requisite knowledge and skill capabilities for actively participating in an interdependent and multicultural world [9]. Reysen and Katzarska-Miller [17] recommend that educators make greater efforts to support the influences of their students’ normative environments and teach global awareness for engendering increased global citizenship identity.

The purpose of this paper is to report findings from case study research on Soka education’s cultivation of global citizenship at its university setting. Building upon Reysen and Katzarska-Miller’s [17] paradigm theorizing antecedents and outcomes of global citizenship identification, this study explores how Soka University Japan addresses global citizenship education, as seen through the various lenses of its administrators, faculty, and students.

2. Soka Education

Soka education is intimately connected with the philosophy of Soka, a humanistic-based approach to wellbeing formulated by Japanese educators Tsunesaburo Makiguchi and Josei Toda in the early part of the 20th century. Daisaku Ikeda, chief architect of the modern-day interpretation of Makiguchi’s vision for humanistic education, as well as founder of a system of schools based on this vision, elucidates the purpose of Soka education in a manner that resonates with the ideals of...
global citizenship, “The aim of Soka education is the happiness of oneself and others, as well as society as a whole, and peace for all humanity” [7]. Shiohara [20] remarks that Soka education aims to nurture students who are qualified as global citizens.

The Soka Education network operates primary to tertiary schools in Japan, kindergartens in Singapore, Malaysia, Hong Kong, Brazil and South Korea, a high school in Brazil, and a university in the U.S.A. Soka University Japan (SUJ) is the subject of the present case study research.

3. Case Study Methodology

3.1. Method

Reysen and Katzarska-Miller’s model of global citizenship identification involves the intersection of four key components - normative environment, global awareness, global citizenship identification, and endorsement of prosocial values. The model proposes that global citizenship identification is an effective mediator of the relationship between its antecedents (normative environment and global awareness) and its outcomes (endorsement of prosocial values and behaviour). This framework lends itself to an examination of Soka University, as the Soka Education school system recognizes the importance of engaged global citizenship as an embedded ethos throughout the entirety of its educational platforms.

This research study employed a mixed methods approach. Semi-structured interviews were conducted with SUJ administrators, faculty and students (current and alumni), and an on-line survey was conducted with SUJ current students and alumni. The interview questions were aimed at generating perceptions and experiences with SUJ’s global citizenship education policies and practices, as well as exploring the participants’ understanding and personal experiences of global citizenship. A thematic analysis was undertaken of the interview data using Attride-Stirling’s thematic network technique [1].

The survey involved a series of 7-point Likert-type scale items adapted from the Global Citizen Scale [16] and the Global Citizenship Scale [10], aimed at generating perceptions about the participants’ normative environment, global awareness, global citizenship identity, endorsement of prosocial values, and global citizenship engagement. Non-parametric correlational tests in the IBM SPSS Statistics (ver. 23) software package were used for generating inferential statistics in the analysis of the survey data.

3.2. Interviews

A fairly diverse participant group from the SUJ community was recruited that included a total of 19 administrators, faculty, students, and alumni affiliated with ten different university departments (undergraduate faculties of Education, International Liberal Arts, Law, Economics, and Letters; graduate schools of Teacher Education, Economics, Letters, and Engineering; and Soka Women’s College). The largest academic discipline represented was education, with 53% of the participants identifying as administrators, teachers, current students, or alumni from the undergraduate education faculty or graduate school of education.

Ten of the interviewees were male (53%) and nine interviewees were female (47%). In terms of longevity of employment experience, the mean length of time that the nine administrator and faculty participants had been working at SUJ was 14.1 years (SD = 10.6), with a range from 2.5 to 33 years. Three faculty members and one administrator were also alumni of SUJ. The mean number of years since graduation for all nine participants who identified as SUJ alumni was 21.7 years (SD =12.4), with a range from 2 to 40 years (including two alumni from SUJ’s first graduating class). Importantly, the participants’ graduation years from SUJ were from all five decades since the founding of the university in 1971, allowing for varied perspectives and experiences over the entire lifespan of the university.

Current students studying at SUJ who participated in the interviews were either at the sophomore (3rd), senior (4th), or graduate (PhD) level, and studying in one of three different faculty departments. One of the senior students was also completing SUJ’s concurrent Global Citizenship Program.

3.3. Surveys

All survey participants were required to have a level of English language proficiency sufficient for completing the survey. A total of 451 surveys were distributed to SUJ alumni and current students, with 159 survey responses received (35% response rate). Thirty-three of the surveys received were discarded, as only demographic questions were answered, and these surveys did not provide responses to any of the global citizenship related items that were the focus of the survey. Twelve of the surveys contained responses in which global citizenship items were partially completed, but sufficiently enough for retention in statistical analysis using a data imputation process. Surveys were fully completed by 114 respondents, giving an overall survey response rate of 28% (126 received of 451 distributed) for statistical analysis.

Survey respondents identified as either female (64%) or male (36%), with ages ranging from 18 - 65 years old...
More than 82% of the respondents identified Japan as their place of birth, with 10 other countries being identified as places of birth origin. Nearly 86% of the respondents identified East Asian as their cultural/ethnic identity. The vast majority of participants (76%) identified as current undergraduates at the time the survey was taken, i.e., had completed less than 4 years of study. Of these students, nearly one-quarter (24%) were only just beginning their studies at SUJ, with another half (52%) in the midst of completing their undergraduate studies. The final quarter (24%) of the respondents reported having already graduated from SUJ.

The participants were studying predominantly in the faculties of International Liberal Arts (53%), Education (18%), and Economics (10%). The rest of the respondents were from a sprinkling of other undergraduate (13%) and graduate studies (6%) programs. A relatively small number of the respondents (6%) were also participating in SUJ’s concurrent Global Citizenship Program.

4. Results

Past research has shown normative environment and global awareness to be highly correlated (S. Reysen, personal communication, April 4, 2015). To test the strength of this relationship in the present research, the Spearman’s rank order correlation coefficient (Spearman’s rho) was performed on the mean scores of the survey items related to normative environment and global awareness, revealing a statistically significant positive relationship between the two variables, $r_s(124) = .57$, $p < .01$. The Spearman’s rho also revealed a statistically significant positive relationship between normative environment and global citizenship identity, $r_s(124) = .69$, $p < .01$, and between global awareness and global citizenship identity, $r_s(124) = .69$, $p < .01$. Taken together, these findings suggest that SUJ students believe that, 1) they are globally knowledgeable and cognizant of their connection to others in the world, 2) most people they value in their lives (e.g., family, friends, professors) endorse the desirability of global citizenship, and 3) these two factors (i.e., normative environment and global awareness) positively influence their identity as global citizens. Table 1 shows the statistical correlations between normative environment and global citizenship identity, and Table 2 shows the correlations between global awareness and global citizenship identity. Table 3 shows the correlations between global citizenship identity and endorsement of the prosocial values identified in Reysen and Katzarska-Miller’s model. All of the prosocial values were positively correlated with one another and with global citizenship identity, suggesting that Soka University students are likely to endorse prosocial values as virtues that align with those of global citizens.

Table 1. Correlations between normative environment (items 1-5) and global citizenship identity (items 6-7).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. People in my family think that being a global citizen is desirable</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My friends think that being a global citizen is desirable</td>
<td>.40</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Most professors and people I know at SUJ think that being a global citizen is desirable</td>
<td>.35</td>
<td>.34</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Students who I know at SUJ think that being a global citizen is desirable</td>
<td>.36</td>
<td>.40</td>
<td>.58</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. If I lived abroad in a foreign country, most people I knew would approve</td>
<td>.40</td>
<td>.37</td>
<td>.50</td>
<td>.45</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I would describe myself as a global citizen</td>
<td>.42</td>
<td>.40</td>
<td>.33</td>
<td>.47</td>
<td>.72</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>7. Identity with global citizens</td>
<td>.43</td>
<td>.40</td>
<td>.30</td>
<td>.35</td>
<td>.56</td>
<td>.71</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Mean: 5.74, SD: 2.13

Pearson’s $r$ significance at $p < .05$, Seven-point Likert-type scale, from 1 = strongly disagree to 7 = strongly agree.

Table 2. Correlations between global awareness (items 1-4) and global citizenship identity (items 5-7).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am aware that my actions in my local environment may affect people in other countries</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I believe that I am connected to people in other countries, and my actions can affect them</td>
<td>.73</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I try to stay informed of current issues that impact international relations</td>
<td>.69</td>
<td>.66</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I understand how various cultures of this world interact socially</td>
<td>.53</td>
<td>.46</td>
<td>.39</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I would describe myself as a global citizen</td>
<td>.52</td>
<td>.49</td>
<td>.47</td>
<td>.54</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Identity with global citizens</td>
<td>.50</td>
<td>.42</td>
<td>.49</td>
<td>.53</td>
<td>.79</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

Mean: 5.17, SD: 1.90

Pearson’s $r$ significance at $p < .05$, Seven-point Likert-type scale, from 1 = strongly disagree to 7 = strongly agree.

Table 3. Correlations between global citizenship identity (Item 7) and prosocial values (items 1-6).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intergroup empathy</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Valuing diversity</td>
<td>.44</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Social justice</td>
<td>.25</td>
<td>.44</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Environmental sustainability</td>
<td>.31</td>
<td>.24</td>
<td>.54</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intergroup helping</td>
<td>.46</td>
<td>.35</td>
<td>.51</td>
<td>.38</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Responsibility to act</td>
<td>.46</td>
<td>.47</td>
<td>.53</td>
<td>.40</td>
<td>.62</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>7. Global citizenship identity</td>
<td>.66</td>
<td>.43</td>
<td>.25</td>
<td>.32</td>
<td>.42</td>
<td>.54</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Mean: 5.48, SD: 2.33

Pearson’s $r$ significance at $p < .01$, except * at $p < .05$, Seven-point Likert-type scale, from 1 = strongly disagree to 7 = strongly agree.

Concurrent with the survey findings, the analysis of participant interviews revealed two key themes. The first theme identified Soka University’s ethos as one that cultivates a global citizenship identity, while a second theme acknowledged that the university broadly promotes global awareness as a necessary pathway to global citizenship engagement. These perceptions are reflected in the following participant comments.

Soka University provides us with a lot of opportunities to think about global citizenship. I really think that Soka University students are required to think and act on how well we can put these things into practice. (Student)
We’re focusing on the development of the person as a whole individual, to be able to develop as a human being, who is going to be globally aware, who’s going to have global compassion, who’s going to be able to take action for the wellbeing of society. (Administrator)

Taken together, both the thematic and survey analyses strongly suggest that Soka-educated students are quite likely to endorse prosocial values that are associated with global citizenship.

Examining the survey data for possible relationships between global citizenship engagement and the other major variables addressed in the survey reveals the following statistically significant correlations: normative environment, $r_1 (126) = .21$, $p < .05$; global awareness, $r_1 (126) = .21$, $p < .05$; global citizen identity, $r_1 (126) = .25$, $p < .01$; influence of SUJ, $r_1 (126) = .34$, $p < .01$; and prosocial values endorsement, $r_1 (126) = .41$, $p < .01$. This set of correlational data suggests that SUJ students are likely to engage in global citizenship activity when they: perceive valued others in their environment as endorsing of global citizenship, are globally aware, self-identify as global citizens, perceive their university as influential in shaping their global citizenship values, and they personally endorse prosocial values. It appears that the presence of any of these conditions may contribute to Soka University student’s motivation to become globally engaged.

5. Discussion

The research presented in this paper explores the cultivation of global citizenship at Soka University Japan. Building on, and lending empirical support to Reysen and Katzarska-Miller’s model of global citizenship identity, the present research shows that SUJ’s normative environment of endorsing global citizenship ideals and promoting global awareness significantly correlates with students’ increased identification as global citizens. Furthermore, the strength of students’ global citizen identity is shown to significantly correlate with the degree of students’ endorsement of prosocial values and behaviours. Reysen and Katzarska-Miller [17] propose that one’s environmental context and global awareness are key determinants to one’s identification as a global citizen, and that a university’s culture of supporting global citizenship values, for example, can influence student global citizen identity and subsequent endorsement of prosocial values and behaviours. Furthermore, Reysen, Larey, and Katzarska-Miller [15] suggest that college curriculum infused with concepts related to global citizenship contributes to greater global awareness, global citizenship identification, and endorsement of prosocial values.

The findings from the present research have potential implications for the implementation of global citizenship education programs in higher education; particularly those that focus on global interconnectedness, and that wish to better prepare students for effective cross-cultural interactions and understanding ([3], [18]).

6. Conclusion

This paper identifies Soka education as an educational philosophy and pedagogical practice that aligns with Reysen’s theoretical model relating antecedents and outcomes to global citizenship identification. The research findings suggest that global citizenship identity is cultivated at Soka University Japan in the presence of a normative environment in which persons valued by the students endorse global citizenship, and in which global awareness is promoted. The research also suggests that the presence of global citizenship identification corresponds to an attendant endorsement of prosocial values and behaviours.

The present research supports the development of global citizenship curricular and co-curricular strategies in higher education that consider the antecedents and outcomes of global citizenship identity as a means for cultivating global citizenship identity.

7. Acknowledgements

This paper is based on doctoral research conducted by the author. The author wishes to acknowledge the support of Dr. Carolyn Jackson and the Department of Educational Research, Lancaster University, U.K.

8. References


Session 4: Curriculum, Research and Development

Building the Educative Component in Science Learning Games
(Authors: Richard S. Prawat, Theodore R. Prawat)

The Relation between High-School Students’ Performance and Feedback Memory
(Authors: Maria Cutumisu, Daniel L. Schwartz)

The effect of possessing a global English test certificate for college graduates in China
(Authors: Pan Kunfeng, Cui Sheng)
Abstract

This paper presents a view of scientific discovery that has the potential to change the way we construct learning games in science. This view is based on the work of a nineteenth century philosopher and scientist whose work, supported by a new generation of historians of science, counters the traditional view of scientific discovery as induction—the notion that new ideas are built from the bottom up so to speak, from particular experience to general concept. This view of knowledge, which is also at the heart of the concept known as pedagogical content knowledge in teacher education, we will argue, complements efforts to bolster the educative aspect of games in a way that contributes to, rather than detracts from, the all important immersive aspect.

1. Introduction

With games being increasingly recognized as formats for legitimate curriculum in education, the desire to develop curriculum in the STEM content areas has kept pace with this view. There is a growing belief, in other words, that games can be both educative and engaging. The second characteristic, engagement, encompasses the two traits of being interactive and plain old fun. The trick in combining education with immersion, particularly as it relates to designing games that teach core concepts in science and mathematics, is, it must be emphasized, no easy task.

The purpose of this paper is to highlight one of the ways in which this task can be carried out. It draws heavily on the experience of the first author, who studies STEM related educational issues, and the second author, who is an independent game developer and a major consultant on a STEM related, federally funded game project.

2. Describing the Educative Component

What both authors bring to the discussion of educational games is a belief in the role that technology can play, in concert with the immersive aspect of games, in promoting understanding of powerful core content in all disciplines taught at the K-12 level and beyond—and especially in science and mathematics. Immersive technology, we believe, creates opportunities that encourage children to want to know more about a particular situation, especially as it relates to the disciplinary big ideas that help explain the situation. In history, this could involve a brief portrayal of a well-known historical situation—like the fall of the Alamo—as viewed from an unfamiliar (i.e., Mexican) perspective. A disciplinary big idea that might emerge from student interactions with this portrayal is the notion of “history as story”—told from a particular perspective and with a unique set of heroes and villains. What makes the approach we advocate different from most that rely on technology to mediate learning in disciplinary areas is the unique perspective we bring to bear on the pedagogical process.

This view assigns top priority to the concept of pedagogical content knowledge. Pedagogical content knowledge (PCK) represents knowledge of content for teaching and thus is distinct from content knowledge per se, which is typically measured by performance on subject-matter tests [6]. Lee Shulman, the person who originated this concept, insisted on one further stipulation which we have found extraordinarily helpful in thinking through our approach to games: This is the notion that PCK assumes that ideas are the unit of analysis. Teaching, Shulman wrote, is at its core the “exchange of ideas.” Teachers who appreciate the role of big ideas in disciplinary knowledge, research demonstrates, bring a unique perspective to bear in thinking about the role of knowledge [3]. They appear to value knowledge as a transformative rather than what might be termed a merely informative interaction with the world. The informative approach, in its most enlightened, constructivist form, as we explain below, still views knowledge as primarily instrumental in nature.

A problematic situation, by definition, is complex for the individual who is trying to make sense of it. This is especially the case in those problems that require disciplinary knowledge to unravel. The preferred approach in science education to the problem of making sense of this type of situation is the process known as “discovery learning.” This process is typically viewed as a “facts first, concepts later” boot strapping operation. The approach, which drives at lot of progressive alternatives to traditional text-based curricular material, places a special
burden on the student - a large part of which is the fact that it views the role of knowledge as being essentially negative in nature. Knowledge is a tool that enables us to deal with obstacles or difficulties in life. Thus, for example, students are told that they have to learn the valuable task of taking number apart and putting it back together in early elementary school so that they can avoid being in a real life problem situation like that of being cheated by the corner grocer.

There is a second, nontraditional way of thinking about the role of disciplinary knowledge in a person’s life. Big ideas developed in the disciplines can open up new elements or facets of the world for the novice learner. They make life more interesting. Shulman writes that a trait shared by teachers who value pedagogical content knowledge is that of turning ideas around in their heads. Not only do these teachers examine ideas, they take them for a ride so to speak. An example might be reflecting on the notion in biology that structure dictates function, and then seeing how many specific things in and outside the domain of biology can be viewed through the lens provided by this idea. It is big ideas developed within disciplines, according to Goodwin [1], that allow those in different professions to transform the world into what he calls the “phenomenal categories” that make up their work environment. Disciplinary ideas can thus open one up to the power of possibility.

This view of knowledge insists that scientific discovery is an ideas first leap of creative understanding termed “abduction.” This notion is now widely accepted by science historians who discard the notion that great minds like Darwin or Einstein discovered their groundbreaking new ideas as a result of a fact and pattern finding process. (On his voyage to the Galapagos, Darwin failed to note which islands particular finches came from despite the fact that the variance in specific characteristics [e.g., shape of beak] played an important role in his theory [7].) Science historians, drawing on the unofficial record, now understand that theories like Darwin’s emerged from an act of creative intelligence so dramatic that it represented, according to Jacob Bronowski, an “explosion of thought” [5]. One of Darwin’s notions, that of nature selecting, developed in his mind as a metaphor. Being an English countryman, Darwin was well acquainted with the notion that man can create new species (i.e., of dogs and sheep) through selective breeding. This metaphor, he realized, was the perfect lens for viewing a process that created species.

Teachers who appreciate the power of disciplinary ideas must, at least implicitly, share this second view of knowledge discovery: That is, that it represents a creative insight that points to an important regularity in the world. We have contrasted the approach to teaching and learning that best fits this view of knowledge as a hybrid of the two divergent roles, the “guide on the side” and the “sage on the stage.” The teacher who fully appreciates the eye-opening role that ideas play in a student’s life would be less likely to see the value in either extreme - passive guidance or frontal presentation - as it relates to the presentation of powerful concepts in the classroom. The teacher’s inclination would be to use big ideas to foster a transactive relationship between students and world. This notion fits well with Shulman’s concept of pedagogical content knowledge (PCK).

The teacher’s role in the above scenario is more like that of a tour guide, a “sage on the side” in other words (or, more properly, “a sage alongside”) [4]. PCK-oriented teachers are excited about the specifics of what their professional vision reveals about important aspects of the world. As a result, they are eager to equip students with a similar set of lenses. These disciplinary lenses connect students and teachers to important regularities in the world. Once this transaction occurs it allows the non-professional to experience phenomena in a way akin to how professionals in the discipline experience it. The sense of excitement that results can be similar, if not identical, to that experienced by those who achieve an important objective in an immersive game.

3. Two Examples of the Use of PCK in the Development ofEducative Games

As indicated, Theodore, one of the co-authors of this paper, worked as a game consultant on a large NIH game development project. One of the early steps in this process involved the development of mathematics and science guides for teachers and students. Theodore urged the project managers to entertain the possibility of using a big ideas approach in this regard. This process began with identifying the core aspects of subject matter knowledge that are vital to an expert (i.e., a scientist) who, it is recognized, makes use of this knowledge in their field everyday. One example presented in the guides was, not surprisingly, also a focal area in one of the games that was developed in environmental science: This was the idea that our everyday air contains a lot of particulate matter. This was a novel idea for a lot of middle school level students, many of whom did not realize that our air, every minute of every hour, contains thousands upon thousands of airborne particles.

A second powerful idea, closely related to the notion that air contains a lot of particulate matter, is also a common core standard at the middle school level: This is the notion that quantities of air, like quantities of water, differ in the amount of particulate matter they contain. This idea, it was decided after some discussion, might give rise to a number of questions in students’ minds about how
scientists go about measuring air quality. One obvious one relates to the kinds of containers scientists use for this purpose. Are circular containers, for instance, more useful for storing or moving air than square ones? Students are likely to have noticed that pipes used to move fluids are circular rather than square. There is less friction – more “room to move” – for the particles that make up fluids in round pipes. In scientific terms, the particles spread out in a “symmetrical” way in round pipes.

The issue of how one measures air quality is part of a complex overall problem situation, as our analysis of the big ideas involved in understanding the situation indicates. One test of the extent of the complexity of the problem is the breadth of the disciplinary knowledge that might be brought to bear on it. The people in charge of the NIH project wanted to push this notion in their game: They suggested that Archimedes great discovery about circles and cylinders could be added to the mix. Two thousand years ago, this Greek mathematician developed a geometric principle that explains the relationship between circles and squares (or other non-circular shapes). Archimedes’ big idea, states that, “Among all two-dimensional geometrical shapes with the same perimeter (i.e., same size outer boundary) the circle has the largest area.” It is a circular shape—in other words, as opposed to a non-circular shape with the same perimeter—that provides the most “room to move” (i.e., area). Archimedes proved that this was the case by bringing logic to bear: First, he estimated the area of a circle by creating different size polygons which consisted of a series of identically shaped triangles arrayed around a common point. By measuring and comparing the perimeters of polygons just inside and just outside a circle, Archimedes was able to estimate the size of the circle by comparing figures where the circles encompassed the polygons with those where the obverse was true - that is, the polygon encompassed the circle. Comparing formulas for the two encompassing variables allowed him to derive the formula for measuring the area of a circle - which was the first step in computing the area for a cylinder or balloon. Knowing how to compute the area of circles and cylinders was a godsend for engineers faced with, for example, solving a number of area versus boundary issues (e.g., constructing strong pillars to support a building).

This test of the depth of knowledge issue as it relates to the problem of air quality is relevant to a second pragmatic question that those who seek to develop games that are both educative and engaging must confront. How do game developers hold students’ attention in a context that must, by definition, be immersive (i.e., interactive and goal oriented) while, at the same time, focusing their attention on hard-to-learn common core science and mathematics standards? This is the sixty-four thousand dollar question. There are two possible responses to the question: First, game developers, assuming they take care in the selection of the problem situations they present to students, must rely on the power of those situations to evoke interest. The two criteria that most relate to the power of the situation, in our opinion, are aspects of the graphic interface that are often seen as disparate: They should be real but also, in as far as possible, imaginative as well. If gamers are looking for a classic example of what this means, at least as it relates to the characters in a game, they need go no further than Maurice Sendak’s monsters with human feet in his fifty-year-old award winning children’s book, Where the Wild Things Are.

A second response to the question raised above is that game developers must also trust in the power of each problem situation to evoke ideas that reveal new insights about the nature of the situation. The problem here is that the presentation of ideas, and the students’ ability to interact with those ideas through quick responses to verbal or visual stimuli, should not interfere with the students’ progression through the game. In other words, the educative and immersive aspects of the game should go hand in hand. Hopefully, the air quality example shows that complex problem situations can be used as an occasion to bring to the fore a number of big ideas in science, mathematics, or other disciplines, all of which shed light on aspects of the particular problems and thus provide the knowledge necessary to suggest possible courses of action - possible solutions - in response to those problems. In a game context, it is the connections between ideas that allow students to also connect the diverse set of responses they make to the questions.

A second, brief example will be presented. The idea presented in this example is one of the core science standards presented on page 188 of a document published by the National Academies Press [2]. The standard is described this way: “The foundation for Earth’s global climate system is the electromagnetic radiation from the sun as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems and this energy’s re-radiation into space. The earth absorbs and stores large amounts of energy from the sun during the day and releases it very slowly over the nighttime hours.” This standard, somewhat surprisingly, is listed as one that the students are expected to master at the end of grade 12. In focus group testing, we have been able to demonstrate that students are able to grasp this concept at the end of fifth grade. We will describe the game approach we used in a brief prototype example of the larger game we plan to develop.
In the first step in the process of teaching this particular big idea, following the abductive process outlined in the abstract, students are presented with a doubtful situation—one that involves an event they think they understand but that they soon discover is more complicated than they originally thought. To achieve this goal we began the segment of the game that focuses on this standard with a question, “When is it coldest during the 24-hour cycle of day and night?” followed by a three item multiple-choice question: “It is coldest during the 24-hour cycle at (A) midnight; (B) sunset; (C) sunrise. Almost all of our fifth grade students in the focus group selected choice “A” (midnight) first. To make it more game-like we exploded the incorrect choices that students made (A and B) into nothingness and acknowledged the correct response (C) with bells and whistles.

The majority of students chose “A,” not understanding that the earth, during the nighttime hours, slowly releases energy from the sun during the day. Knowing that they feel warmest at noon, the fifth graders may have reasoned that it would be coldest at midnight. At any rate, their surprise that the answer was not “midnight” or, for that matter “sunrise,” creates a perfect learning situation. We found that several students during our focus group work even asked how this could be. Why is it coldest just before dawn? A relatively uninteresting event, the fact that it gets colder at night, suddenly became interesting, even confusing. This, according to the abductive model, creates a “teachable moment” that can open students’ eyes to a new, even exciting regularity in the world.

In the example discussed here, a context is provided for the presentation of a visual metaphor that, based on focus group results, almost immediately enlightens students about the slow process of energy release during the night. This goal was achieved by having students focus on two different split-screen images introduced by a brief written statement: “Look at these two images (A on the right, B on the left). Pick the one that best explains why ‘sunrise’ was the correct answer to the question you were just asked.” Two possible representations of the energy-release regularity, one of which points the way to the correct solution, appear next on the video game’s screenshot: The first, a light switch being turned off, suggests a simple relationship between the sun going down and the earth getting cold. The second suggests a more complex relationship. This is the depiction of a pot of water on a gas stove that contains a large thermometer. When they turn the fire beneath the pot off, the students notice that the amount of heat shown on the thermometer slowly dissipates. Image B, most decide, is a better illustration of what is happening when energy from the sun is slowly released from the earth at night.

This second brief example is an attempt to illustrate how sudden metaphoric insight can create an understanding that transforms how a student (or a scientist) views an important phenomenon like weather in a relatively short amount of time. In a sense, this example highlights the fact that ideas originate as iconic or perceptual metaphors. Archimedes, to cite another example, had a sudden realization that the volume of irregular shaped objects could be measured by immersion in water, an insight that came to him in the midst of a bath, with his own body serving as a physical metaphor for the new idea. The suggestion here is that “idea tools” like the one used in the second example (i.e., the boiling pot of water) could be used to plant the seeds of an idea about a problem situation.

4. Conclusion

Metaphor or analogy is the mothers’ milk of pedagogical content knowledge. Representations of big ideas in the content areas (PCK), and the kind of quick responses to those representations used in the second example, could provide the answer to the question of how games can teach and students can still move on within an interactive and goal oriented structure that games provide. In a sense, the second example augments the first: The first highlights the importance of carefully thinking through the network of scientific (or other disciplinary related) ideas that identify regularities in carefully selected problem situations (e.g., particulate matter in “bad air”); the second highlights the role of abduction, defined in the classroom as the leap of understanding made possible by teachers’ skillful use of representations.

Together, we believe, the two examples provide valuable lessons for game developers who recognize the difficulties, as we have emphasized in this paper, of trying to affect a balance between education and engagement in game design.

5. References


meeting of the American Educational Research Association, Chicago, IL.


The Relation between High-School Students’ Performance and Feedback Memory

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Stanford Graduate School of Education, USA²

Abstract

This paper describes a study that explores the relation between high-school students’ feedback choices, memory for these feedback choices, and task performance. Choices to seek confirmatory (positive) or critical (negative) feedback and to revise posters in a poster design task were collected from ninety-two students from a Western US high school via Posterlet, a computer game assessment. A week following the study, the students were asked to recall the feedback phrases they encountered in Posterlet. Results show that the choices to seek critical feedback and to revise correlate with poster performance and with the amount of critical feedback remembered. A closer examination of the feedback value revealed that students’ choices to revise correlated with the amount of informative, rather than uninformative, feedback remembered. Implications of students’ feedback choices on their performance and feedback memory are discussed.

1. Introduction

Educational approaches to feedback have been researched extensively and they have yielded inconsistent results [1, 2, 3]. For example, critical (negative) feedback improves performance under specific circumstances [4], but it can hinder performance in others [4, 5]. Moreover, it is not clear to what extent students read or pay attention to feedback regardless of the quality of the feedback that the instructors provide [6]. The proposed research draws on our previous work examining the effect of choosing critical feedback, showing that the more the students chose to seek critical feedback, the more they dwelled on feedback [7]. The current study presents a novel free-recall task designed to explore the relation between students’ choices to seek feedback and to revise, their memory for feedback, and their task performance. To the best of our knowledge, the current study is the first exploration of the relation between students’ feedback valence choices and students’ feedback memory. The study poses the following research questions:

1) Do choices to seek feedback and to revise correlate with the feedback remembered?
2) Do choices to seek feedback and to revise correlate with the informative or uninformative feedback remembered?
3) Does poster performance correlate with the choices to seek negative feedback and to revise, and with the memory for feedback?

The remainder of this paper reviews the literature relevant to the study, it describes the Posterlet assessment instrument that collects students’ feedback and revision choices during a poster design task, and it presents empirical evidence that memory for critical informative feedback is associated with performance and with the choices to revise and to seek critical feedback.

2. Literature Review

Choice-Based Assessments. Traditional assessments focus on students’ outcome accuracy at a given point in time, but they do not provide an insight into how prepared students are to learn on their own and to perform well on new tasks. In contrast, choice-based assessments [8], which stem from constructivist assessments [9], focus on the learning processes in which students engage while solving a new challenge. These types of novel assessments offer a glimpse into how prepared students are to learn on their own. This paper examines, for the first time, students’ choices collected using a choice-based assessment game. In contrast to our previous research that focused on validating choices as predictors of independent learning outside of the assessment environment, the current research aims to understand more about the mechanism of feedback processing and, thus, it focuses on students’ memory for the feedback valence they freely choose.

Feedback Memory. Selective memory for feedback is a strategy individuals employ to cope with self-threatening feedback (i.e., feedback that accurately highlights one’s weaknesses), likely as an effect of self-protection motivation. For example, the mnemonic neglect effect [10] is defined as inferior
recollect for self-threatening feedback compared to other types of feedback (e.g., self-affirming feedback or feedback that highlights one’s strengths). However, this effect is attenuated if the feedback is perceived as referring to modifiable traits, when it can trigger self-improvement motivation [11, 12, 13]. In this paper, the critical feedback students choose is constructive and not punishing. Thus, this research hypothesizes that students will remember this type of feedback well. Another individual characteristic that is known to affect feedback processing is a learner’s limited working memory capacity, which constitutes the ability to concomitantly store and process information. Thus, the learner must process the feedback information while drawing from prior knowledge stored in long-term memory [14]. A limited working memory implies a limited ability to decode or to make sense of the feedback in the context of a specific task [15].

Feedback Memory and Performance. Research on the neural correlates of learning provides evidence that neural responses to feedback can predict future performance. Specifically, the brain responses to feedback are predictive of whether university students will repeat mistakes or will learn from their mistakes [16]. In this paper, the relation between students’ memory for critical feedback and their subsequent performance is explored for a high-school population.

Feedback and Dwell Time. In our prior research, we found that the more the students chose critical feedback, the more they dwelled on their chosen feedback messages [7]. This may indicate that students pay more attention to critical feedback than to confirmatory feedback. An eye-tracking study focused on help behaviors revealed that students with a positive attitude towards help also dwelled more on the help messages [17]. This indicates that students’ attitudes toward self-improvement may play an important role in their engagement with feedback. However, our previous studies showed that any student, not just a student already employing good learning strategies, who chose more critical feedback from one round to the next, also spent more time reading feedback from one game round to the next. In this paper, the relation between students’ memory for critical feedback and the time they take to read their feedback is explored.

3. The Posterlet Assessment Game

The Posterlet choice-based assessment game was designed to collect and assess two learning choices students made while they were designing posters: the choice to seek confirmatory (positive) and critical (negative) feedback about their posters and the choice to revise or not their posters after choosing feedback from three virtual animal characters on each poster. Students played three rounds of the Posterlet game. On each round, students chose either confirmatory (i.e., I like) or critical (i.e., I don’t like) feedback from each of the three virtual animal characters, as shown in Figure 1.

![Figure 1](image)

Figure 1. After designing a poster, students choose between confirmatory and critical feedback from three characters in Posterlet

Then, students chose whether to revise their poster or not. The feedback messages generated by the game alternated between informative (confirmatory: “Your poster helps people know where to go.” or critical: “Where is the Fall Fair going to be?”) and uninformative (confirmatory: “I like fairs” or critical “I don’t like fairs.”). The Posterlet assessment instrument is described in detail in our prior work [7].

On each round, the game tracks the number of critical feedback choices, as well as the number of revision choices made by the student. These measures are employed to quantify students’ learning choices in the game. Additionally, the game analyzes each poster and produces a poster score displayed to the students as the number of tickets sold by their poster booth after the final version of the poster is submitted. This measure is employed to quantify the students’ poster performance (i.e., it reflects how many graphic design rules students used correctly versus incorrectly on each poster).

4. Methods

4.1. Participants and Procedures

Participants are ninety-two students, ranging from grade 9 to 12, from a public high school in a Western United States mid-sized city. The testing activity took place in students’ regular classrooms, as one of several assessments administered that day. Students designed three posters in the Posterlet game (M=8.12 minutes, SD=3.82) individually. Most students completed at least two rounds of the three-round Posterlet game. Then, after a week, students
filled a feedback memory survey individually. An example of a student’s answers to the memory survey is shown in Figure 2.

4.2. Measures

4.2.1. Choices. Critical Feedback measures the number of “I don’t like…” choices made by the student, ranging from 0 (the student chose only confirmatory feedback across the game) to 9 (the student chose only critical feedback across the game). Revision measures the number of posters a student chose to revise, ranging from 0 (the student chose to never revise posters across the game) to 3 (the student chose to revise all three posters). As well, the informative (Critical Informative Feedback) and uninformative (Critical Uninformative Feedback) components of feedback were tracked. The Confirmatory Feedback measure is complementary to the Critical Feedback measure. Specifically, on each game round, a student makes three choices between either confirmatory or critical feedback. Therefore, across the game, Confirmatory Feedback is computed as 9 minus Critical Feedback. Thus, all direct correlations with Critical Feedback constitute inverse correlations with Confirmatory Feedback.

4.2.2. In-game Poster Performance. Posterlet generates a Poster Quality score based on 21 design principles reflecting a student’s performance across all rounds of the game. The quality of each poster is the sum of the scores for each of the 21 features: 1 if a feature is always used correctly on a poster, 0 if a feature is not included on the poster, and -1 if a feature is used incorrectly on a poster. Poster Quality measures the sum of each of the three posters’ quality. The first round of the game was treated as exploratory. For some analyses, a new measure, Poster Quality 2&3, was created that restricted Poster Quality to the last two rounds of the game. This measure constitutes the sum of the poster quality across the last two rounds of the game. It was computed to provide a better sense of students’ behaviors, because the first round of the game was exploratory, the game lacking a separate tutorial.

4.2.3. Memory for Feedback. Critical Feedback Remembered measures the number of critical feedback messages remembered by the student. The paper differentiates further between Critical Informative Feedback Remembered (e.g., specific information that was incorrect or missing on the poster, such as small-size text used on the poster) and Critical Uninformative Feedback Remembered (e.g., “I don’t like fairs”). The Critical Feedback Remembered measure represents the sum of these two measures. Equivalent measures for confirmatory feedback were collected: Confirmatory Feedback Remembered constitutes the sum of Confirmatory Informative Feedback Remembered (e.g., specific information that was correct on the poster, such as a large font-size text used on the poster) and Confirmatory Uninformative Feedback Remembered (e.g., “I like fairs”). Finally, the Total Feedback Remembered measured the sum of the Critical Feedback Remembered and Confirmatory Feedback Remembered. For example, in Figure 2, the student’s answers represent different types of feedback remembered: 1 (i.e., “I like fairs”) is confirmatory uninformative, 2 is critical uninformative, 3, 5, and 6 are critical informative, and 4 is confirmatory informative. The score for each of these four categories represented the count of the answers in that category. For example, this student’s scores were the following: critical informative feedback remembered = 3, critical uninformative feedback remembered = 1, confirmatory informative feedback remembered = 1, and confirmatory uninformative feedback remembered = 1.

4.2.4. Time on Task. Design Duration measures the amount of time students spent designing their posters. Feedback Duration measures the amount of time students spent dwelling on their feedback (i.e., reading the feedback).
5. Results

5.1. Do choices to seek feedback and to revise correlate with the feedback remembered?

Spearman correlations were conducted to answer this question, because the measures included in these analyses were not normally distributed. Table 1 shows the correlations between the Posterlet measures and the amount of feedback (critical, confirmatory, and combined) remembered. Both choices (Critical Feedback and Revision) correlate with the critical feedback remembered. Moreover, the choice to seek critical feedback correlates with the total amount of feedback remembered. There is no association between Critical Feedback and Confirmatory Feedback Remembered. Consequently, there is no association between Confirmatory Feedback and Critical Feedback Remembered, since Confirmatory Feedback is a complementary measure of Critical Feedback.

Table 1. Correlations between choices and measures of the memory for feedback

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<td>Cr. Fb.</td>
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<td>Revision</td>
<td>.24*</td>
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Note: *p<.01, **p<.05, Cr.: Critical, Cf.: Confirmatory, Fb.: Feedback, Rem.: Remembered.

Consistent with the findings of our previous research [7], Negative Feedback and Revision were also correlated (rho = .46, p < .001). Next, the analyses examined whether Negative Feedback and Revision were independent predictors of the critical feedback remembered. Thus, both choices were entered in a linear standard regression. Results show that the model was significant [F(2, 89) = 20.99, p < .001, R Square = .32, and Adjusted R Square = .30] and that Critical Feedback was a significant predictor [t(89) = 6.20, p < .001] of Critical Feedback Remembered, but that Revision was not a significant predictor of Critical Feedback Remembered [t(89) = -1.13, p = .26].

5.2. Do choices to seek feedback and to revise correlate with the informative or uninformative feedback remembered?

Results indicate that Critical Feedback correlated with both measures of critical feedback remembered: Critical Informative Feedback Remembered and Critical Uninformative Feedback Remembered, as shown in Table 2. Revision only correlated with Critical Informative Feedback Remembered.

Table 2. Correlations between choices and feedback memory measures, by informative and uninformative feedback value

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Note: *p<.01, **p<.05, Cr.: Critical, I.: Informative, U: Uninformative, Cf.: Confirmatory, Rem: Remembered.

5.3. Does poster performance correlate with the choices to seek negative feedback and to revise, and with the memory for feedback?

Performance and Other In-game Measures. First, the study investigated whether the in-game measures (poster performance, design duration, and feedback duration) were correlated with the choices to seek negative feedback and to revise. The Spearman correlations of the measures are presented in Table 3. Results show that students’ poster performance (Poster Quality) correlates with both choices (Critical Feedback and Revision), which is consistent with our previous research. Also, the time students spent designing posters (Design Duration) correlated with Revision and with Poster Quality. Finally, the time students dwelled on feedback (Feedback Duration) correlated with the critical feedback chosen and with the time students spent designing posters.

Table 3. Correlations of in-game measures

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<th>Measure (n=89)</th>
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<td>Poster Quality</td>
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<td>Design Duration</td>
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Note: *p<.01, **p<.05, PQ: Poster Quality, DD: Design Duration, FD: Feedback Duration.

Performance and Memory for Feedback. The next analyses investigated whether the in-game measures (poster performance, design duration, and feedback duration) were associated with students’ four different types of memory for feedback, according to the valence and informative value of the feedback. Spearman correlations between the measures and the memory for feedback are presented in Table 4. Results indicate that Design Duration correlated with both the critical informative and confirmatory informative feedback remembered. Although results show a positive correlation between Feedback Duration and Critical Feedback, no association was found between dwelling on feedback and memory for confirmatory or critical feedback.

Table 4. Correlations between feedback duration and memory measures

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<th>Measure (n=89)</th>
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Note: *p<.01, **p<.05, PQ: Poster Quality, DD: Design Duration, FD: Feedback Duration.
Finally, the association of performance, choices (seeking feedback and revising), and memory of feedback on the last two rounds of the game was further explored. Specifically, only the last two rounds of the game were considered in the analyses, because the game lacked a tutorial and students used the first game round to explore the features available in the game. Standard linear regression analyses were conducted to investigate whether students’ performance on the last two rounds of the game provided any insights into the type of feedback students remembered. Results yielded that Poster Quality 2&3 (the poster performance on the last two rounds of the game) predicted Critical Feedback Remembered \( R^2(90) = .22, p = .03; F(1, 90) = 4.89, R \text{ Square} = .05, \) Adjusted R Square = .04, but it did not predict Confirmatory Feedback Remembered \( R^2(90) = -.49, p = .62; F(1, 90) = .24, R \text{ Square} = .003, \) Adjusted R Square = -.008. More specifically, Poster Quality 2&3 predicted Critical Informative Feedback Remembered \( R^2(90) = .34, p = .02; F(1, 90) = 5.47, R \text{ Square} = .06, \) Adjusted R Square = .05, but it did not predict Critical Uninformative Feedback Remembered \( R^2(90) = .94, p = .35; F(1, 90) = .41, R \text{ Square} = .01, \) Adjusted R Square = -.001.

### 6. Discussion

**Choices and Memory.** Results revealed that the more the students chose to seek critical (negative) feedback and to revise, the more feedback they remembered overall. Specifically, when the valence of the feedback remembered was examined, results showed that the more the students chose to seek critical feedback and to revise, the more they remembered critical feedback. Conversely, the more the students chose to seek confirmatory (positive) feedback (which is the complementary measure of choosing critical feedback), the less they remembered critical feedback. Moreover, of the two choices (to seek critical feedback and to revise), only seeking critical feedback predicted the amount of critical feedback remembered by the student. This result indicates that the choice to seek feedback is more important than the choice to revise for feedback memory. Next, the study aimed to discern between the impact of informative and uninformative value of critical feedback on feedback memory.

**Feedback Value and Memory.** Results show that the more the students chose critical feedback, the more critical informative and uninformative feedback they remembered. However, the more the students chose to revise, the better their memory for critical informative, not uninformative, feedback. This result indicates that informative feedback is more important than uninformative feedback for driving revision. Conversely, the choice to seek confirmatory feedback inversely correlated with both the informative and the uninformative critical feedback remembered, but it did not correlate with any of the types (informative and uninformative) of confirmatory feedback remembered. Thus, the more the students sought confirmatory feedback, the less they remembered critical informative and uninformative feedback, without improving their memory for confirmatory feedback. This indicates that choosing critical feedback has a more lasting effect on memory for feedback than choosing confirmatory feedback. Next, in a follow-up analysis, the association between critical informative feedback and performance was explored.

**Performance, Choices, and Feedback Memory.**

Consistent with prior research, poster performance correlates with both choices to seek critical feedback and to revise [7]. Regarding feedback memory, on the combined last two rounds of the game, poster performance predicts students’ memory for critical informative feedback. This result indicates that the better the students perform on the poster design task, the better they remember the critical feedback that they chose in the game.

**Time on Task and Feedback Memory.** The time students spent designing posters correlated with Revision and Poster Quality, consistent with prior research [7]. Also, the time students dwelled on feedback correlated with their choice of critical feedback and with the time students spent designing posters. In terms of feedback memory, the time students spent designing posters correlated with both the critical informative and confirmatory informative feedback they remembered. The time students dwelled on feedback did not correlate with their memory for feedback. This situation may be due to considering the first round of the game in the analyses. In the future, a more detailed analysis will be conducted by linking the remembered feedback to each game round and by limiting the analyses to the last two rounds of the game, when students had already settled on a learning strategy.

### 7. Conclusions

The paper provides an insight into feedback processing and recall by examining students’ memory for the feedback they choose, following data

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**Table 4. Correlations between in-game measures and feedback memory measures**

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collection of their learning choices via a choice-based assessment game, Posterlet, designed to track students’ choices between confirmatory and critical feedback. The data provide evidence that choosing critical feedback is associated with better memory for critical feedback. This research has implications for the design of assessment environments that can help students engage more closely with feedback, remember the feedback content better, and, consequently, apply it to improve their performance.

8. Future Work

The relation between the valence (i.e., confirmatory or critical) of the feedback sought by students and their memory for critical and confirmatory feedback was explored. In the future, a follow-up study will explore whether students remember critical and confirmatory feedback differentially when they receive (i.e., when they are assigned), rather than choose, their feedback. The study will also explore whether there are any associations between the feedback valence students remember the most and other measures (e.g., academic achievement or mindset).

9. Acknowledgements

We thank all the students and teachers for their participation, the Gordon and Betty Moore Foundation, and the NSF (Grant # 1228831) for their generous support. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the granting agencies.

10. References


The effect of possessing a global English test certificate for college graduates in China

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Abstract

This paper estimates the economic return to English ability for college graduates in China by using data from Chinese Education Panel Survey (CEPS). OLS and PSM methods show that it is more valuable to possessing global English test certificates such as TOFEL, GRE and IELTS than domestic English test certificates.

1. Introduction

Language ability is an important part of human intelligence [9], and also the important part of human capital. Language ability relating understanding, speaking, reading, and writing, is usually denoted as a person's mastery of language and the level of application [10].

Now, as English has become the lingua franca of international business, English language ability has become a valued global commodity, particularly in non-English speaking countries. In China, English language is one of the three major subjects tested on the college entrance examination (CEE). Chinese college students still have to learn English for one or two years. There are two main types of tests to evaluate college students' English ability. One is called College English Test (CET) driven by National College English Testing Committee, a public testing service organization. CET is divided into two different level test, CET4 and CET6. Most Chinese students in domestic colleges take part in CET4 test. The other type of tests is organized from foreign private test organizations, namely GRE, TOFEL, IELTS and so on. These tests are executed in global scale. The fee for taking part in the second type of tests is far more than ten times of the previous one. However, more and more students choose to get certificates of the global English tests even though they have no attention to apply for further study abroad. English tests score or grade certificates are usually stressed in graduates’ Resume who seek for a job. Though English test play so important role in college students’ study career, the study of the economic return to English ability in China is rare.

In this paper, we investigate whether there is wage premium in Chinese labor market for those college graduates who have the global English certificates. In addition, we test whether there are differences in the returns to between the global English test and domestic English test.

2. Previous studies

Research on economic return to English language ability is concentrated of immigrants in English speaking countries. The result shows that there is positive link between English proficiency and individual’s earning in USA and UK [5], [13]. English also has great importance on wage premium in labor market in some Non-English speaking countries such as Germany [19], Israel [14], India [2] and Korea [8].

The researchers have found that not all of the English language skills had the same wage effect. Some research shows that speaking ability is more important than reading and writing ability [10], while others find the opposite that reading ability is more important than speaking ability [5].

Why English language ability has the wage premium effect? The study on the influence mechanism of language ability on wages shows that language ability could serve as media which can help a worker to transfer his academic knowledge or skills to the production process [17]. Language ability and other professional ability has certain substitution effect.

The previous studies which measure language ability mainly adopts the way of self – Evaluation. However, individuals could over-estimate or underestimate the level of their language abilities so that the estimation of the relation between language ability and wage would be biased [1]. In order solve the problem, the objective test score or certificates could be used as the good proxy variables of individuals’ language ability. In recent studies of college students achievement or graduates’ earnings, ACT sub test score in American [3] as well as CEE sub-test score [20] or CET scores [11] in China are used to evaluate one’s English ability.
Research focusing on the Chinese college graduate’s English language ability and the employment salary is very few. When CET scores are used as English proficiency index, it is significant that CET score has positive relations to graduates’ starting salary [11]. However, the score effect of global English test such as TOFEL, GRE in China are still unknown.

3. Methodology

3.1. Theoretical Framework

Human capital theory can be used to establish the theoretical framework. According to the theory of human capital, individual’s ability has a significant positive effect on the return of education (Mincer, 1974). Language ability is acquired through learning, so learning English can be regarded as an important part of human capital investment. In the framework of human capital, Language Capital, the new concept is put forward [4], [6]. In this framework, the students who take part in the English exam have accumulated stronger skills through learning. English language skills, as an input factor in the production, can increase the marginal product. As a result, the graduates who have acquired higher scores would have wage premium in labor market. Which test scores are associated closer with a higher salary depend on from which type of test the students get higher ability.

There is, however, an alternative framework. In accordance to signal theory [18], due to the existence of asymmetric information in the labor market, college students need to send signals about their own ability to the employer. English test scores or certificates are valuable signals. Students with different endowment have different cost on taking part in English exam. The higher the original ability, the less the cost. As a result, which test scores are associated closer with a higher salary depending on which type of test the students get higher ability.

3.2. Empirical strategy

3.2.1. OLS estimate

Previous studies on the economic returns to language ability, controlling the employer’s gender, education level, home district, family background and so on, adopt linear regression model [6], [15]. Here we also use the similar model. We focus on the discussion that whether there is additional return to have a global English test certificates. Suppose the earning function of college students after graduation is determined by the following equation:

\[ \ln W_i = \beta_0 + \beta_1 \text{engtst}_i + \beta_2 \text{CEEtotal}_i + X_i\gamma + \epsilon, \]

\( \ln W_i \) is the logarithm of monthly income of starting salary for student \( i \). The variable \( \text{engtst}_i \), which stands for whether a student has global English test certificates such as TOFEL, GRE, IELTS and so on, represents the English ability for an individual. CEEtotal, which stands for the total score of College Entrance Examination in China serves as a proxy variable for intellectual ability. Many variables \( X_i \) such as individual information, family background, employment type and so on which could affect one’s wage are controlled to reduce bias. Here, OLS method is used to estimate the coefficients.

We addressed the sample selection bias resulting from wage missing values by applying Heckman’s correction [12]. Some college graduates did not enter labor market after graduation but to pursue advanced studies in China or abroad immediately. Here, we estimate the Mills Lambda to correct the model.

3.2.2. Propensity Score Matching (PSM).

OLS estimate could have selection bias problem sometimes. In our study, propensity score matching (PSM) is also used to find the average treatment effect(ATE) of having an global English test certificate. We choose covariates which could affect a student to take part in the global English test and then estimate the propensity score by logistic regression. Using the propensity score, we do the data balancing and calculate the ATE by matched sample.

4. Data

The paper utilizes longitudinal data form Chinese Education Panel Survey (CEPS) for the empirical analysis. The survey started in 2009, sampled all undergraduates in public universities in Beijing and applied three-order random sampling of universities, majors and students. Altogether, 5,100 undergraduates with 255 different majors in 15 universities are chosen. These undergraduates are of the 2006 and 2008 cohort. From 2010 to 2013, four round of annual follow-up survey have been conducted. In the database, 902 college graduates for cohort 2006 have entered the labor market just after they acquire bachelor degree and 573 for cohort 2008.
Table 1: Effect of global English test on college graduates’ starting salaries

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* p<0.05, ** p<0.01, *** p<0.001
Table 2: Quartile regression on the effect of global English test on college graduates’ starting salaries

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* p<0.05, ** p<0.01, *** p<0.001
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*p<0.05, **p<0.01, ***p<0.001
Table 4: Comparison of domestic and global English test effect

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<th>(2)</th>
<th>(3)</th>
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<td>1,185</td>
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<tr>
<td>R-squared</td>
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Note: * p<0.05, ** p<0.01, *** p<0.001

The control variables are the same as the previous tables but omitted here.

Table 5: effect of global English test (PSM)

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<tr>
<td>kernel</td>
<td>.193</td>
<td>0.149</td>
<td>3.94</td>
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</table>

Covariates are the same as the previous tables.
5. Results

As Table 1 shows, possessing a global English test certificate will increase about 20% on starting wage. Table 1 shows the result after Heckman’s correction, which indicates that the sample selection bias is not obvious.

Table 2 shows the result of quartile regression, and Table 3 shows the regression result by sub-samples. Both of the two table indicates that the effect of possessing a global English test certificate is robust.

Table 4 shows that even the English ability which is represent by domestic English test CET4 score controlled, the effect of possessing a global English test certificate still have positive effect. In addition, the CET excellence certificate does not has the effect on wage as well as global English test.

Using PSM methods, the result also shows that there is strong effect of the treatment of possessing a global English test certificate.

6. Discussion and Implications

The results lead to the conclusion that the job market in China does recognize the value of English ability of college graduates. Having international test of English certificates have a steady strong wage premium effect, however, the effect of domestic English test is much smaller. This result can be either viewed as an human capital or signaling or a mix of both. For Chinese college students, to take part in the foreign English test is the good way to deliver signals to the employer. For the education management department in China, how to improve the domestic English test’s value should be discussed seriously.

7. Reference


Session 5:  Curriculum, Research and Development

Academic Teacher Induction in a Multiple Campus University Environment 1 - Opportunities for Change and Innovation
(Authors: Marie B. Fisher, Anna Gemmell)

Academic staff development: a panacea for quality teaching and learning in higher education
(Author: E. N. Cishe)

Learning Choices Predict High-School Students’ Memory for Critical Feedback
(Authors: Maria Cutumisu, Daniel L. Schwartz)

Exploring Primary School English Language Teachers’ Perceptions of INSET in Malaysia: Factors which Promoted and Hindered Professional Development
(Authors: E.L.L.Pang, D. Wray)
Academic Teacher Induction in a Multiple Campus University Environment 1 - Opportunities for Change and Innovation

Marie B. Fisher, Anna Gemmell
Australian Catholic University,

Abstract

Significant changes occurring in the Higher education sector in Australia since 2009 with regard to academic teaching standards, pressure to publish, maintaining currency with technology and achieving secure employment appear to affect the inclination of new academics to participate in short term professional development. ‘Just in time’ or staged approaches that address a pathway to build learning and teaching experience during a semester would be more viable as it supports staff in their new academic role while at the same time addressing barriers facing new academics. It is hoped that by sharing our experience at the Australian Catholic University (ACU) and seeking feedback from the global community, we can create opportunities to integrate this staged approach to complement face to face workshops and provide improved support for our new academic teachers by helping them develop their sense of identity in their new teaching roles.

1. Introduction

The aim of this paper is to outline the challenges that affect design, development and delivery of Academic teaching induction in face to face workshops to support new academics in a multiple campus university environment. We wish to share our observations and reflect upon this ‘work in progress’, as well as communicate the strategies we used to overcome these obstacles at ACU. By documenting these experiences, we hope to contribute to global knowledge for the benefit of our colleagues in similar situations worldwide.

Informal feedback from attendees and observation from more experienced academics is that a ‘one off’ Introduction to Learning and Teaching workshop is not fulfilling the needs of these staff. ‘Just in time’ or staged approaches that address a pathway to build learning and teaching experience during a semester would be more viable as it supports staff in their new academic role. It is hoped that by sharing our experience and seeking feedback from the global community we can provide improved support for our new academic teachers.

2. Literature Review

When conducting a literature review to determine whether there were any studies explaining why academic staff may resist ‘voluntary’ professional development and best practices adopted by institutions to support learning and teaching initiatives for teaching academics new to their institutions the results were not surprising.

In Australia, since 2009 [1] there has been pressure from government and accreditation bodies on universities to improve student outcomes and provide excellent learning and teaching experiences for them in their undergraduate and postgraduate courses. Addressing the diverse needs of students from non-traditional cohorts who may have literacy challenges has been a concern for Australian universities [2]. This means that there is an expectation that academics new to teaching will engage in academic induction introducing them to learning and teaching frameworks expected to be integrated into their respective disciplines [1], [3].

Many academics struggle to develop a professional identity for a number of reasons. Issues with workload, diversity of duties and projects such as: research, scholarship, keeping up to date with their discipline, student management and administration as well as the additional requirement of integrating a Teaching Framework put pressure on academics [4], [5]. If one is time poor then it is likely to mean that professional development, if optional, is not always viewed as important compared to meeting targets.

Recent research has shown that resistance to academic development or induction occurs for a number of reasons such as:

Disciplinary: knowledge of their discipline is more important than academic induction.

Student deficit: perception by some academics that students admitted to university are less academically capable due to poor schooling.

Skill and performability: perceptions by academics that skills of a good teacher may be limited to excellent public speaking or performing rather than integrating a teaching framework and engaging with the complexity of 21st century teaching necessary for excellence in teaching one’s discipline [6].
If you think of the Professional Development continuum, the ILAT is not just about new technologies but linked to the framework and the academics lifelong learning. Many academics may consider that ILAT is for new academics and not academics who have previous experience and therefore don’t think they need to attend. That it doesn’t offer them anything they don’t already know and is not encouraging them to rethink what they do. Much of ILAT is about being a successful teacher and collaborating with others and transforming their teaching through community and sharing experiences.

In addition, the burden of digital literacy in a world of rapid technological change means that even the most ‘tech savvy’ individual can become overwhelmed or reluctant to engage with technology that may only be relevant in one semester until it is replaced by another [1], [7]. Also, learning and teaching can be transformed when more collaborative activities involving participation by students and academic colleagues who have strengths in digital literacy, as well as ideas for activities to engage all parties in their own learning and development.

3. Background/context

The ‘Introduction to Learning and Teaching’ (ILAT) face to face workshop program has been designed as the first step in orientation to the structures, organisation, policies and procedures that underpin new academic teachers’ learning and teaching activities together with an overview of additional teaching support initiatives which are available to them to foster excellence in teaching.

These initiatives are included under the umbrella ‘Teacher Professional development continuum program’ within the Learning and Teaching Framework 2014-2017 [5] designed to transform the future direction of learning and teaching at our University.

At ACU a face to face workshop entitled ‘Introduction to Learning and Teaching (ILAT) is offered once per semester to academic teaching staff new to ACU on all domestic campuses (except Adelaide on request). Attendance at a workshop on one’s local campus is highly recommended but not mandatory under the current policy. According to the Professional Development for Academic staff policy, responsibility for engaging in one’s development rests with the academic staff member and is not mandatory but encouraged [8]. As with evaluations there needs to be a link between the ILAT, criteria framework for continuous improvement and academic employment and opportunities to improve their teaching practice.

While these face to face workshops have been considered, by attendees, to be useful to academic teachers new to ACU, feedback and observation by the authors has indicated that they want to be able to access operational help at different stages of the semester when they need it most or ‘just in time’. It is evident that they are not sure what support they need at the face to face workshops until they experience particular teaching activities such as marking and providing feedback on the first assessment piece in week 3 or engaging with students about certain issues online at particular points in the semester as well as working effectively with colleagues on curriculum development.

4. Australian Catholic University

Australian Catholic University (ACU) was established in 1991 and formed from an amalgamation of teaching colleges, religious institutes in Eastern Australia. There are 7 domestic campuses in 4 states, New South Wales (NSW), Queensland (QLD), Victoria (VIC), South Australia (SA), and 1 territory, Australian Capital Territory (ACT) [4]. An additional international campus, a joint venture with the Catholic University of America, was opened in Rome in September 2015. The University emerged from the smaller teaching colleges established by clergy from a number of Catholic religious orders.

The larger campuses are situated in major cities located in Sydney, Melbourne and Brisbane. These campuses are managed by 3 Associate Vice Chancellors. Ballarat and Canberra campuses are led by a Campus Dean. Most campuses teach undergraduate and postgraduate courses in the 4 faculties: Education & Arts, Health Sciences, Law & Business, and Theology & Philosophy. Each State or Territory has their own legislation and requirements for professions in Law & Business, Education, Nursing, Paramedicine, Psychology, Physiotherapy and Social Work making the issue of uniformity and offering ‘just in time’ help with introduction to teaching workshops for new teachers problematic [4].

5. Current Opportunities v Challenges

Digital literacy is a challenge for many academics due in part to rapid development of new technologies [2]. The issues for the senior executive of our University encompass one off, recurrent costs and the dilemma of choosing a ‘one size fits all’ approach that is valid for at least 3 years, to professional development support, particularly in relation to teaching focused academics who may be reluctant to engage as it may indicate they are ‘not up to the job’ and risking job security [6], [11].

Academics report that they are ‘time poor’ and, as a result of their workload, are unable or unwilling to commit time to access the self-service resources.
provided for them in a dedicated Learning Management System (LEO) Moodle unit site. As well as LEO there are a number of other self-paced resources e.g. LEO guides, TOC (teaching online course) and also the LT website, as well as faculties creating their own LEO units to assist new staff. So a pathway is important for them to know where to put their entry and time.

Feelings of being overloaded and reluctant to participate in professional development, particularly self-paced offerings, are not uncommon based on recent academic literature on this topic [6], [1], [4].

As a result of these challenges the authors sought and accommodated feedback and considered methods for improving the face to face experience by proposing a more staged approach.

6. Change Management Strategies

Initially there were too many expected learning outcomes for a half day workshop, some of which were only able to be achieved in a general rather than a specific academic teaching context. Changing the learning outcomes so that they are more targeted to academic teaching roles was problematic as the primary author is the only member of the senior leadership team who has had recent faculty teaching experience and knowledge of their roles.

Eliciting useful feedback from faculty staff with teaching experience, and identifying what new teaching academics needed to know, has been a challenge. This was due to diverse cultures across campuses and variation in student numbers, influencing the type of teaching approaches required for large and small classes, management of units, and curriculum development, particularly on large campuses. In addition, there is a wide variety of roles, responsibilities and teaching experience within disciplines revealed during workshops.

Over the last 3 years there has been a significant loss of corporate, university knowledge and implementation of change management at ACU. This has affected how the Learning and Teaching Centre is permitted to market workshops and support

6.1. Communication to Staff Strategy

Organisational culture in Higher Education institutions is more complicated due to differing academic priorities, administration needs as well as a perception that no one has complete authority, particularly in relation to academic development [9]. Our University is no exception and communication strategies are more problematic as they are applied across multiple campuses.

Prior to late 2014, when a new service oriented Change Management approach was introduced to dispense with unnecessary duplication of services on each campus, the National Co-ordinator was required to contact all the Associate Deans Learning and Teaching (ADLTs) in each faculty, administrators in each school by faculty and, if known, new academic staff to advise them of the workshops.

This is linked to the fact that ILAT is not mandatory for new staff and is not centrally managed. It is dependant/relies on administrative staff informing new staff of this option. There are no badges or recognition that might add value to the academic attending. ILAT is entered in staff connect but this does not connect the academic pathway at ACU.

As previously mentioned, there are a number of other self-paced resources e.g. LEO guides, TOC (teaching online course) and also the LT website, as well as faculties creating their own LEO units to assist new staff. So a pathway is important for them to know where to put their entry and time. This process was unsustainable given there was only one person designing, developing and delivering multiple workshops by campus.

However, making contact with faculty executive and staff in this way did appear to be a reasonably successful strategy to reach the target audience, despite being time consuming, as it built relationships between two sub cultures, which had different organisational priorities namely: academic staff and administrators or professional staff [9].

Advertising academic, elearning and professional development workshops, including the face to face ILAT workshops at ACU, occurs through a National staff newsletter distributed by the National Marketing team (MERC) on Tuesdays and Thursdays via email.

While potentially this is an excellent way of streamlining communication across multiple campuses at ACU, dispensing with the need for ‘email bombing’ all staff, as well as removing unnecessary administration for the National co-ordinator, the primary author, it has resulted in the target audience, academics new to ACU and their supervisors often ‘missing’ the advertisement. Many academics have stated they want a more personalised approach e.g. it is included in their offer.

6.2. Staged Academic Induction Support Program

Based on feedback from face to face ILAT workshop attendees, the authors also proposed a case for a ‘staged support’ program for new academic teachers in their first semester of teaching at ACU, delivered by webinar. It is expected that participation in this program could be used as evidence for one or more of the recently approved ACU Teaching criteria and standards framework. This Framework was developed in consultation and accommodation of feedback from academics in face to face
workshops held on every domestic campus across ACU in 2015.

It is aligned to teaching only academics commencing at Level A (beginning academic) to Level D (senior academic at the Associate Professor or above level). This framework provides 7 clear, objective and consistent teaching criteria as follows: 

a) Design and planning of learning activities;
b) Teaching and supporting student learning;
c) Assessment and giving feedback to students on their learning;
d) Developing effective learning environments, student support and guidance;
e) Integration of scholarship, research and professional activities with teaching and in support of student learning;
f) Professional and personal effectiveness [5].

At the time of writing this article, the proposal for the ‘Staged Webinars, expected to be part of the teaching continuum, ‘Just in time’ program of targeted support for academic teachers new to ACU, was being considered as an extension of the face to face ILAT offerings by the Executive.

7. Theoretical Approaches

Engagement of attendees with their colleagues in workshops is encouraged through exploring issues arising in real life learning and teaching by working through scenarios. They are encouraged to discuss issues arising in their particular scenario and work with colleagues in multi-school groups to develop a solution. This is scaffolded by the academic development lecturer/facilitator using a Scholarship of Learning and Teaching approach (SoLT) [10]. This may involve discussions that will challenge and transform how they may be thinking, practicing and integrate this with a learning teaching framework integrated into their discipline [5]. In essence promoting collaboration with colleagues as a means whereby professional development milieu is created so knowledge, skills and approaches to learning and teaching can develop through sharing and providing academics with peer feedback.

Through collaborative learning opportunities offered to academic teachers in face to face as well as a proposed virtual learning environment it is expected that support and assistance from colleagues will be a more useful. It is more likely to provide a forum to help new academics solve issues arising from teaching experience during the semester. While it is proposed to offer the ‘stage approach’ in real time those staff unable to attend could benefit from reviewing the short recording of 5-10 mins when they have time available. An overview of the key points that came up during the webinar recording would also be beneficial.

Transformative learning is possible through collaboration and community of practice, which may involve meeting regularly via webinar or on their local campus, to improve practice and the value of teaching, and in this way achieve excellence in teaching [recent article by [7], [10]. Developing one’s professional teaching practice is part of the Learning for Life Framework 2014-2017 an initiative designed and developed to encourage, support and reward a continuum of excellence in learning and teaching at our University [11].

8. Conclusion

The authors have observed through their teaching, learning and self-reflection that providing a ‘one size fits all, just in time’ introduction to learning and teaching support model is no easy task and it will take time to develop a flexible continuum of academic teacher induction support that serves our target audience.

While the journey so far has been interesting as we learn more about our own preferred learning, teaching, curriculum development and professional practice, we have considerable work to do in consultation with faculties, campuses and the Executive if we wish to support new teachers’ confidence and engagement in their own learning.

Improvement in communication strategies about teaching support options, available to all our academic teachers new to ACU, is helping academics change their thinking about how useful professional development is for excellent teaching.

However, to engage academics we need to help them discover and address where they have gaps in digital literacy, engage them with the ACU teaching criteria and framework that integrates with their respective discipline and encourage self-directed transformational learning through collaborating and sharing knowledge, skills and ideas with their colleagues in their own faculties as well as across ACU.

Therefore, we seek and would like to accommodate global feedback to improve our practice as well as help other universities across the world by sharing our own experiences of design, development and delivery of academic induction for teachers new to ACU.

9. References


Academic staff development: a panacea for quality teaching and learning in higher education

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Abstract

This paper reports on challenges faced by one Higher Education Institution in promoting the quality of teaching and learning through academic staff development. It is a case study of a multi-campus higher education institution in the Eastern Cape, South Africa. The National demands on quality and concentration by Higher Education Institutions to meet these demands compromise the provision of quality teaching, thereby hindering the quality of learning. Also, many systems of external quality assurance are cumbersome, bureaucratic and time-consuming for academics and their effect in improving quality is generally not yet conclusively demonstrated. Compliance with external requirements on quality initiatives results to lack of time towards staff development, and in some cases making it difficult for staff development. Qualitative interpretive paradigm informed the investigation. Semi-structured interview was conducted with the Teaching Development Consultant coordinating staff development to generate data. Findings revealed that although staff development can enhance quality teaching and learning there are challenges to achieving quality. These challenges are presented in this paper. In conclusion, some recommendations on how quality in teaching and learning can be promoted and maintained through academic staff development are suggested.

1. Introduction

While universities enjoy rewards for research, both in terms of finance and status, there seems to be no equivalent for teaching and yet universities are required to pay greater attention to improving teaching and enhancing student learning. They need to become more accountable to external bodies for the quality of teaching and learning at their institutions. The National demands on quality and concentration by Higher Education Institutions to meet these demands compromise the provision of quality teaching, thereby hindering the quality of learning.

In South Africa quality standards in higher education are ensured by a number of quality assurance bodies which include, amongst others, the Higher Education Quality Committee (HEQC), the Engineering Council of South Africa (ECSA), the Health Professionals Council of South Africa (HPCSA) and the South African Institute for Chartered Accountants (SAICA). These are profession specific and are likely to have contracting demands. Institutions are, therefore, destined to be busy spending over time complying with external accountability requirements with little or no time left to innovate in teaching, learning, offering quality teaching and enhancing quality learning. In order to offer quality teaching and enhance quality learning there should be well developed academic staff. In the institution under study, it is the role of the academic development consultants to ensure that there is quality teaching and learning.

2. Purpose and objectives

The aim of this paper is to explore academic staff development as a tool to enhance quality teaching and learning in higher education and presents the challenges faced by a multi-campus university in fostering quality teaching and learning. In order to achieve this aim, the paper seeks to answer the following questions:

1. How does academic staff development contribute to quality teaching and learning?
2. What strategies are employed in promoting quality in teaching and learning?
3. What are the challenges experienced in fostering the quality of teaching and learning?

3. Quality teaching and learning

Quality can be understood as fitness for purpose. Because teaching and learning process is complex, there are no straight answers for the quality equation and this paper will not attempt to provide that. Two principles can be used in trying to understand quality.

These are identifying student’s cognitive development as a major objective of education systems, and the role of education in promoting shared values, responsible citizenship and creative and emotional development (Guttman, 2005).
Biggs (2001) and Tam (2001) define quality as an outcome, a property, or a process in higher education. Quality teaching is understood by Hénard and Roseveare (2012) as the use of pedagogical techniques to produce learning outcomes for students. This involves the effective design of curriculum and course content, a variety of learning contexts and effective assessment of learning outcomes. They see quality teaching important in higher education despite the continuous changes experienced by institutions. It is a part of a global quality approach and of the institutional strategy and should not be isolated from the institutional quality culture.

Quality teaching in higher education involves the use of pedagogical techniques to produce learning outcomes for students. It involves several dimensions, including the effective design of curriculum and course content, a variety of learning contexts (including guided independent study, project-based learning, collaborative learning, experimentation, etc.), soliciting and using feedback, and effective assessment of learning outcomes. For quality teaching to be effective, it should involve well-adapted learning environments and student support services. This implies that there should be good teaching. Good teaching leads to quality teaching. Fielder and Brent (1999) refer to good teaching as lasting acquisition of the knowledge, skills, and values and it leads to effective learning. In order to enhance student learning there should be focus on quality teaching initiatives. The university should care about teaching and if it wants its teaching to be of good quality, it must value teaching and show that it matters. Encouraging a quality teaching culture should consist of supporting academics in order to enhance teaching culture among leaders, teachers, students, staff and other stakeholders. Academics should be allowed to discuss about teaching and learning as Gravett and Geyser (2004) argue that teachers who discuss their struggles and seek advice are those who are dedicated to teaching and to their students. These are teachers who regard teaching as a daunting, yet enriching and enjoyable task. Gravett and Geyser (2004) argue that it is the quality of the learning experience that determines successful learning.

Bruening (2011) asserts that an opening speech by the then South African Minister of Education, Prof Asmal, during a conference on higher education curriculum at the University of Pretoria in April 2004 reiterated the government’s position and strategic purpose for higher education in South Africa, which is to produce graduates who are well rounded and thoroughly grounded; who are skilled and competent; who are creative, flexible and adaptive to new challenges; who are adept in critical thinking and cultural literacy; who are enabled and empowered to participate fully in their economy, their society and in their world that is rapidly changing. The quality of teaching and learning in higher education institution is, therefore, dependent on having well developed academic staff as it is only well-developed and properly qualified academics that can facilitate successful and quality learning. This means that academics involved in teaching and supporting student learning should be qualified, supported and adequately resourced for that role. The quality of the staff in institutions of higher education is central to the effectiveness of teaching, portrays Fielden (1998). In his paper, Fielden (1998) argues that high quality and well motivated teaching staff and a supportive professional culture are essential in building excellence. It is not what the lecturer can offer and students learn, but the quality of both teaching and learning. Increasingly, there is a need to view teaching as an intellectual act that contributes to the transformation of knowledge (Boyer, 1990). The presence of the learning content is no assurance that learning will take place. Gravett and Geyser (2004) argue that it is the quality of the learning experience that determines successful learning.

4. Academic staff development

HEQC (2004: 23) define academic development as ‘a field of research and practice that aims to enhance the quality and effectiveness of teaching and learning in higher education, and that enables institutions and the higher education system to meet key educational goals, particularly in relation to equity of access and outcomes. Volbrecht and Boughney (2004) refer to academic development as an open set of practices concerned with improving the quality of teaching and learning in higher education through integrating student, staff, curriculum, institutional and research development. To these authors, quality is a broad term, referring to commitments to social justice, excellence, effectiveness and efficiency.

The report on the survey of directors of academic development in South African universities carried out by Gosling (2009) revealed areas of academic development work that were rated as most important by the largest number of academic directors who participated in the survey. These were grouped into four clusters which were:
1. provision of staff development activities, notably induction/orientations to teaching courses for new academics and training in use of ICT/e-learning;
2. engaging in and promoting research in learning and teaching;
3. providing leadership for learning and teaching and implementing strategic direction of their institution, and
4. Assisting in the development of new courses.

In the areas mentioned above, I regard provision of staff development activities as crucial. This involves providing advice to staff members and providing individual support to academics who experience difficulties in their teaching. Academic staff development is used to represent a range of formal and informal activities aimed at contributing towards academic capacities as scholarly educators and it should be geared to help academics promote student learning. The report by Gosling further reveals that professional development of staff was regarded as an important function of the academic development centres.

It is important that academics are given the opportunity to develop their teaching practice in ways that contribute to maintaining effective and relevant learning by students. It is the responsibility of higher education institutions to provide professional development for its academics aiming at supporting effective learning by students from disadvantaged backgrounds. Academic staff development is not without challenges. Scott (2009) argues that the primary challenge of academic development is to strengthen the academic and professional foundations and at the same time take forward the educational development agenda.

5. Fostering quality teaching and learning through academic staff development

Hénard and Roseveare (2012) portray the practice of fostering quality teaching as a multi-level endeavour with one of the levels aimed at encouraging teachers to innovate and adopt learner-oriented focus. These teachers should co-operate with students, colleagues from other departments, and with external stakeholders as members of a dynamic learning community. Pennington and O’Neil (1994) believe that there should be a workable strategy for teaching and learning at an organizational level. To this end, they suggest that organizations should align strategic objectives in teaching and learning in a way to demonstrate how commitment to scholarship and research, flexibility, community regeneration and all similar statements carry over into students’ actual experiences of the curriculum. It should be recognized that change in teaching and learning approaches is effective when integrated with appropriate strategies for staff development, curriculum renewal, quality assurance, resource allocation, information technology and the development of the physical and material learning environment (Pennington and O’Neil, 1994: 14). The role of quality assurance and quality control mechanisms is not merely to ascertain whether procedures have been followed, but also to promote curriculum change and to act as reference point for judging the degree to which students experience quality learning in practice.

Hénard and Roseveare (2012) assert that fostering quality teaching presents higher education institutions with a range of challenges at a time when the higher education sector is coming under pressure from many different directions. These pressures include conforming to external demands as presented earlier in this paper. Higher education institutions need to ensure that the education they offer meets the expectations of students and the requirements of employers, both today and for the future. In order to do this, they should foster quality teaching and enhance quality learning. Hénard and Roseveare (2012) further state that institutions should support the enhancement of teaching quality.

Universities in South Africa have different strategies aimed at improving teaching and learning. For instance, Cape Peninsula University of Technology (CPUT) uses Curriculum Officers to improve teaching and learning while Walter Sisulu University (WSU) uses Teaching and Learning Development Consultants to do the same. At WSU, the Centre for Learning and Teaching Development (CLTD) adopted the developmental aspect of O’Neil (1994: 14). Numerous workshops on facilitation of learning and appropriate methodology were conducted for academic staff but the impact these had on staff development may not be realised.

Strydom, Basson and Mentz (2012) argue that enhancing the quality of teaching and learning is a key strategic focus area in higher education and that accountability demands on higher education institutions that relate to the quality of teaching and learning are increasing. This calls for higher education institutions to find ways of providing evidence in measurable ways of what they are doing to improve teaching and learning (McCormick, 2009 quoted in Strydom, N Basson and M Mentz, 2012).
6. Methodology

This is a case study undertaken in a multi-campus higher education institution in the Eastern Cape Province of South Africa. According to Leedy et al. (2005), a case study enables one to have an in-depth investigation of small number of cases. It focuses on one instance (or a few instances) of a particular phenomenon with a view of providing an in-depth account of events, relationships and experiences occurring in that particular instance hence the focus was only on one Learning and Teaching Development Consultant. Staff development is the responsibility of Learning and Teaching Development Consultants. The higher education institution has four campuses that cover a distance of over 1 000 km in a round trip. The shortest distance is 130 km from one campus to another and the longest is approximately 260 km.

The qualitative interpretive paradigm informed the investigation. This approach was chosen as it is an inquiry process based on building a holistic complex understanding of a social problem. It is characterized by data collection method in a natural setting. Qualitative approach enabled me to approach the subject, probe the setting, and describe perceived realities in a more natural way and in great depth. The participant was interviewed and with his permission the interview was recorded.

7. Data analysis

The interview was transcribed word for word trying to understand and make sense of the responses. I listened to the voice recorder and organized the data by breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important to be learnt. The goal was to create descriptive, multidimensional categories, which form a preliminary framework for analysis. Words or phrases or events that appeared to be similar were grouped into the same category. The findings are presented in the section below.

8. Findings

In this section I present findings and challenges faced by a multi-campus university in fostering the quality of teaching and learning through academic staff development. It transpired that the institution under study is no different from other national universities whose cultures prefer research activity over teaching. This is a result of the funding formula that is based on the throughput rate and research output. The unexpected consequence of this framework may be the lowering of standards in order to improve the completion rates so as to qualify for higher subsidy rates.

The university offers opportunities for academic staff development in the form of workshops that focus on teaching and learning strategies, assessing students, curriculum development, learner guide development and basic e-learning workshops. Academics are also offered an opportunity to register for Post Graduate Diploma in Higher Education and Training (PGDHET) with all costs paid for by the university. These opportunities are offered through Helpdesk invitation, departmental requests and individual applications. The participant was not sure of the extent to which these opportunities develop academics and contribute to the quality of teaching and learning.

It is the role of CLTD, Human resources (HR) and Heads of Departments (HoDs) to ensure that academics are developed. CLTD liaise with departments on their needs and workshops conducted are based on the needs analysis. These training sessions are aimed at enhancing quality teaching and learning. They are quality assured and those offered by external service provider are registered and accredited by the Skills Education Training Authorities (SETA). Despite the attempts by the institution, academic staff development was hindered by poor attendance of the training sessions by lecturers, non support by HoDs, institutional rules to enforce staff development attendance, none recognition of professional development points benefiting academics professionally and towards promotion.

The institution initiated Vice Chancellor’s Awards for excellence in teaching and learning for remarkable improvements in teaching and learning. This involved self-evaluation, peer-reviewing and benchmarking of practices. The aim of these awards was to develop excellent teachers. The participant was concerned that although this was an attempt to develop academics it was only done once due to institutional financial challenges and the continuous changes experienced by institutions. He affirmed that the awards will be revived in the near future as the financial situation has improved.

The participant also highlighted the following as challenges in academic staff development. These were the difficulty in aligning institutional policies to foster quality teaching, raising awareness of quality teaching, support for quality teaching at three inter-dependent levels which are institutional, programme and individual. He also highlighted challenges of providing conducive learning.
environments (libraries, computing facilities) of similar standards and quality in the multi-campuses of the institution due to distance between the campuses. Reference was also made to the different teaching and learning cultures of the campuses.

In so far as enhancing the quality of teaching and learning is concerned, there is lack of resources; there are many academics BUT few teachers (no teaching background). It also transpired that there is lack of academic leadership to drive academic development and lack of formal support towards post-graduate studies, especially PhD. One of the causes may be that the institution is said to be financially non-viable with less budget on staff development. Also, a large number of academics, especially junior members of staff are overloaded, teaching many modules and classes as large as 100 and above and this makes it difficult to ensure quality. Finally, staff appraisal which is a crucial element of staff development is not undertaken.

Some measures to overcome the identified challenges were suggested. These include integrating and embedding academic development within learning and teaching practices with accountability measures to the leadership and management of learning and teaching in academic departments. Doing this would ensure that credibility is given to the teaching competence. Also, the scholarship of teaching and learning should be enforced within departments.

9. Conclusion and recommendations

The findings revealed that there were challenges in fostering quality teaching and learning through academic staff development in the multi-campus higher education institution under study.

The various opportunities for staff development were offered but their impact could not be established. The support is in line with Hénard and Rosevere (2012) who state that the enhancement of teaching quality should be supported. The Vice Chancellor’s Awards for excellence in teaching and learning meant to develop excellent teachers is in line with Felder and Brent’s (1999) idea that the university should care about teaching and if it wants its teaching to be of good quality, it must value teaching and show that it matters. Although the Vice Chancellor’s awards was an attempt to develop academics it could not be continued due to institutional financial challenges and the continuous changes experienced by institutions. This is in support of Hénard and Rosevere (2012) assertion that fostering quality teaching presents higher education institutions with a range of challenges at a time when the higher education sector is coming under pressure from many different directions. Scott (2009) in Bitser (2009) also highlighted a challenge of academic development whilst taking forward the educational development agenda.

The challenges discussed in this paper contribute to the decline of the quality of teaching and learning and pressures override an intention to improve teaching and learning.

10. Recommendations

Having outlined the challenges in fostering quality teaching and learning through academic staff development, I wish to propose the following recommendations that can be useful:

1. Academics teaching the same modules/courses within and across departments/faculties should serve as critical friends. This will contribute to staff development.

2. The funding framework based on student throughput and research output calls for the re-allocation of the academic workload in that the Professors and senior academics should be allocated 1st year students with large numbers. Doing so would provide junior academics opportunities to conduct research and furthering their studies and at the same time improving the quality of teaching and learning.

3. Academic staff members should be offered an opportunity to attend conferences even if they are not presenting a paper. Staff members who have never read a paper in a conference may not be enthusiastic to do so if they do not observe other academics doing so. Opening up conference attendance offers participating in public consultations and this will contribute to staff development.

4. Compulsory time-off should be set aside for academics to develop themselves.

5. Strategies, including awards for excellence in teaching and learning, research and community engagement should be offered continuously.
11. References


Learning Choices Predict High-School Students’ Memory for Critical Feedback

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Abstract

Students’ learning choices, such as seeking critical feedback or revising their work, provide insights into the learning processes that unfold when students learn on their own. This research aims to characterize high-school students who choose to seek critical feedback and to revise posters in a digital choice-based assessment game. Ninety-two students from a Western US high school were sampled. A two-step clustering method was employed to automatically identify student groups based on students’ choices in the game. Results showed that two good-quality clusters were identified: students with a low frequency of choosing to seek critical feedback and to revise (50% of students) and students with a high frequency of choosing to seek critical feedback and to revise (50% of students). A one-way ANOVA analysis was conducted to compare students’ memory for critical feedback between the two clusters. Results showed that students in the high frequency cluster of choosing critical feedback and revising remembered significantly more critical feedback than students in the low frequency cluster of choosing critical feedback and revising. Moreover, this model constitutes a better fit for the data \[F(2, 89) = 4.11, p < .05\] than the previous model obtained via a standard linear regression analysis employed to predict students’ memory for critical feedback using students’ choices \[F(2, 89) = 20.99, p < .001\]. This result suggests that choosing to seek critical feedback and to revise are good choices for improving students’ memory for critical feedback.
Exploring Primary School English Language Teachers’ Perceptions of INSET in Malaysia: Factors which Promoted and Hindered Professional Development

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Abstract

The national concern to improve the level of education in Malaysia prompted the Ministry of Education to conduct a comprehensive review of the education system and introduce the Malaysia Education Blueprint (2013-2025) to transform the education system. One of the aims was to upgrade the quality of in-service teacher training for teachers. This has resulted in a reshaping of the type of courses and delivery mode for in-service education for teachers (INSET) into a top-down, national priority driven training model. The research reported here focuses on investigating the professional development needs of Malaysian primary school English language teachers. Teachers’ perceptions of their professional development and the factors affecting it has so far been under-researched, at least in a Malaysian context. The research is informed by a qualitative survey approach investigating teachers’ perceptions of their CPD through the use of focus groups and individual interviews. This research concerns teachers’ perceptions of the INSET they had attended, their future expectations of CPD, their perceptions of CPD in relation to their pupils’ needs and their views on whether it had changed their practice in the classroom. This paper focuses on the participants’ perceptions of what factors promoted and hindered their professional development and what motivated them to attend programmes for INSET to enhance their skills.

2. Literature Review

Pupils’ achievement is strongly influenced by their parental background, a range of school factors and society or culture [1]. The teacher has been found to be the most important school factor influencing pupils’ achievement [2], [3]. The role of the teacher has come under scrutiny in recent years and the quality of teaching seems to depend upon their professional development. Enhancing teacher quality through CPD is recognised as dynamic and continuous throughout a teacher’s career [4].

In Malaysia, most CPD for in-service English teachers uses the cascade model, an apparently cost effective means to bring educational change to a large population of teachers with limited resources. Nevertheless, a smooth transfer of knowledge is not always achieved and the cascade model is not a guarantee of the training aims being applied in classrooms [5]. The training model of INSET is the dominant form of CPD used to train and re-train teachers [6]. Training and educating teachers is a problematic concept as there is a fine line between both but it is difficult to separate the two as they are related.

According to Webster et al [7], when experienced teachers progress in their careers, their needs change alongside the rapid developments in education which require them to re-orientate themselves. McGill [8] suggests that teachers need to move from having a ‘fixed mindset’ to a ‘growth mindset’, be willing to accept changes and take responsibility for their professional growth.

Wheller and Morris [9] identified that there is little evidence for the effectiveness of professional development and in-service training in any sector. In contrast, research by Cordingley [10] highlighted that collaborative professional development is effective in effecting change in teachers’ beliefs and practice, resulting in an improvement in pupils’ achievement. Thus, INSET which includes elements of collaborative activities is more likely to motivate teachers’ to improve in their practice. This is in line
with the point emphasized by Ball [11] that motivation is central to education.

INSET has also been found to be more effective if it is delivered by experienced trainers and implemented as a whole school approach supported by policies. Lieberman [12] believes teachers should have opportunities to try out new practices as this would encourage their growth and professional development.

3. Focus of Research

The research participants in this study were a group of English language educators who were teaching in primary schools in Malaysia and who had been given the role of School Improvement Specialist Coaches in the previous year. This paper addresses their perceptions regarding the factors which motivated them to enhance their skills and promote their professional development by attending INSET courses for English language teachers and the factors which hindered their development and growth in their role to teach as teachers of English. Their views will be linked to the previous INSET they had experienced, the intervention INSET programme they were attending and the professional development carried out using the cascade model in Malaysia. In addition, the research also aimed to identify the research participants’ future expectations of INSET courses.

4. Research Methods

The broader research within which the present study was located was informed by the qualitative paradigm to determine diversity in a given population. The qualitative survey approach establishes variation in terms of values and dimensions that are meaningful within that population [13]. This research paper focuses on four case studies which examined research participants’ perceptions of their previous and current experiences of attending INSET and their future expectations in relation to their roles as English language educators. The data for the case studies were gathered through individual semi-structured interviews with each of the four research participants taking part in two individual interviews. The first interview focused on questions about their previous experiences of attending INSET and the second interview focused on their views about the intervention INSET course and their future expectations of professional development.

4.1 Sampling

The study took place in a Training Centre in Malaysia from May to July 2015. The research participants had come from a variety of locations in Malaysia but attended the INSET course in one central location. This paper focuses on data gathered from four research participants selected from one group of 22 educators who attended an INSET programme, the ‘Specialist Certificate in Literacy Development for Lower Primary Students’. The 22 participants were initially selected using convenience sampling as they were pre-selected by the English language officer (ELO) in their State Education Department. During the first meeting with the researcher, consent forms were given to all the course participants and 11 people agreed to take part in the study. The researcher then selected seven participants to take part in focus group interviews based on criteria including gender, teaching experience, type of schools they had taught in as well as types of CPD activities attended in the last two years. The other four participants were selected for the individual interviews using volunteer sampling.

5. Findings

5.1. Rita

Rita is a female educator with over 26 years of teaching experience in semi-urban primary schools in Malaysia. She preferred attending short INSET courses of about 3 to 4 days as it was not too demanding on her schedule. One of the factors which promoted her professional development from attending INSET was the opportunity to engage with enriching activities and read scholarly articles. In addition, she also received information from the trainers about upcoming courses and she did not have to pay to attend the course and the travel expenses were reimbursed. Rita found the activity of sharing in small groups helped her to engage with the content of the course before they did group presentations. She found it easier to open up in the small group and discuss any issues and questions. She also emphasized that about 80% of the INSET courses she had attended met her expectations and she was able to share what she gained with other teachers and some of them were willing to embrace some changes in their practice.

On the other hand, Rita stated that there were factors which demotivated her in relation to professional development. Firstly, it was linked to the directive to attend INSET courses selected for educators by the officers at the State Education Department. She found it particularly intensive in 2015 as she had to attend many INSET courses and put various tasks on hold. She also found some of the INSET courses too demanding as she had to do an action plan and complete an assessment component. In addition, she realized that the same course participants were instructed to attend various INSET courses.
5.2. Siti

Siti is a female educator who had been teaching for more than 30 years in rural primary schools. She said that one of the factors which motivated her to attend INSET was being nominated to attend courses held in capital cities such as Kuala Lumpur and Penang and the fact that all costs were subsidized. She did not mind being instructed to attend INSET which was compulsory as she needed the knowledge and the certificate. She shared that all the INSET she had attended was relevant to the primary school standard curriculum (KSSR) and her pupils needs. Siti stated that she would rank most of the INSET courses with a score of 8 out of 10 as they focused on content and were conducted via workshops.

In contrast, Siti shared the main factor which hindered her professional development was having to attend the same course every year and not having a choice of other INSET courses. She stated that she still needed to attend INSET for English literature as well as Phonics because she required the knowledge to improve her practice. She also mentioned that she did not prefer lectures during INSET and often could not follow what was being delivered through mass lectures.

5.3. Lily

Lily is a female educator with about 15 years of teaching experience in urban primary schools. She explained that what motivated her to attend INSET was the opportunity she had previously to attend INSET frequently when she was teaching in a rural area. The courses were taught by native speakers and were relevant to her pupils needs as they focused on the 4 basic skills; listening, speaking, reading and writing. She had to do 16 credit hours in order to complete the INSET programme. Lily believed that the learning process was ongoing and she could learn from peers who were facing similar problems in relation to pedagogy and practice. She explained that since moving to an urban setting, she had not been offered to attend any INSET by the State Education Department and neither had she paid to attend INSET courses run by private organizations.

5.4. Kumar

Kumar is a male educator who had been teaching for about 30 years in urban primary schools. He explained that the factors which motivated him and promoted his professional development were attending INSET which comprised workshops with hands-on activities which could also be carried out in the classroom. He liked practical activities which could be used after completing INSET courses. In addition, the teachers in his previous school attended INSET based on a rotation basis and they often had in-house training on Saturdays, with discussion among the English panel members. In addition, he had also paid to attend INSET courses offered by the Penang English Teachers Association (PELTA) as it was not expensive and the courses were run by officers from the British Council. He felt that he fully utilized the content he learnt from INSET courses which he chose to attend.

In contrast, Kumar highlighted that the factor which hindered his professional development was having the English language officers (ELOs) select INSET programmes for educators without considering their interests and needs. This practice did not cater for all course participants for any INSET course and was a waste of time. In addition, some of the content delivered by trainers during INSET was applicable to western countries and foreign contexts and the ideas suggested were not applicable to the local setting in Malaysian schools. He also found the new component of assessment for INSET course participants too demanding as he had to do an online assessment, prepare an action plan and carry it out as well as write a reflection of 3000 words.

6. Discussion and Conclusion

Based on the findings from the four case studies presented in this paper, the following themes emerged from the data.

6.1. Professional Up-skilling

One of the main aims of INSET initiatives in Malaysia by the Ministry of Education (MoE) is to develop the English language proficiency and teaching skills of English language teachers. The new INSET courses at ELTC include a component of assessment for participants and they need to complete an online assessment, prepare an action plan, implement it and write a reflective essay to be included in a portfolio of tasks for submission.

Rita and Kumar shared similar views that the structure of the INSET courses had changed as previously they only had to participate in INSET with no assessment components and received a certificate of completion. They both found the new model of INSET too demanding for the course participants. In addition, the last year had been very intensive for them as they were assigned to attend many INSET programmes and had to put work related tasks on hold. Nevertheless, the new assessment component of INSET was included as it is vital to aid in developing and enhancing the pedagogic competence of the participants who attend INSET.

On the other hand, Siti shared that the quality of INSET offered was good but she had been attending
the same INSET course annually and would like to participate in INSET on Phonics and Literature as it would cater to her current needs. Similarly, Lily has not been able to attend INSET since moving from a rural school to an urban context. She explained that the provision for INSET is not balanced for educators in rural contexts and cities.

6.2. INSET and Collaborative Learning

Collaborative learning in INSET provides educators with the opportunity to engage in formal and informal discussions about pedagogy. They usually work together during workshops to plan and design new activities using effective teaching strategies or to modify and adapt them to suit different learners’ needs. Thus, collaboration was prioritised during the workshop sessions and there was collective ownership of the task completed in groups. Harris and Jones [14] emphasized that in the classroom, teachers can evaluate their teaching with purposeful collaboration. It can be effective especially when they use their knowledge, skills and understanding as well as data of students’ achievement, thus linking improvements for the student and teacher.

Three case studies in this paper mentioned collaborative learning. Rita gave an example of how she had been able to share knowledge she gained with other teachers in her district and some of them were keen to embrace change. This is in line with the point by William and Leahy [15] that the process of teacher change needs continuous support after INSET. Lily preferred to travel to the cities for INSET as she could exchange ideas and share views with educators from other states and districts. Kumar attended additional INSET on his own which was offered by the State Education Department for a small fee and run by trainers from the British Council. He found it necessary to plan what time of the year he was free to attend these courses and have the opportunity to meet other participants and learn by discussing about common issues faced in the classroom.

In conclusion, the case studies in this small scale research have identified some factors which had promoted their growth in professional development as well as issues which had hindered them from progressing at the pace they had hoped for to improve their practice. The role of educators and their professional development is closely linked to other areas such as varied teaching contexts and the provisions available for INSET in order for them to value the nature of teaching and have continuous support during and after INSET.

7. References


Session 6: Cross-disciplinary Areas in education

Evaluation of Early Childhood Education Programme in Nigeria
(Author: Clementina I. Nwahunanya)

When the Extra Mile Makes the Difference: Teacher Training and the Effectiveness of Add-Ons
(Author: Emily Gonzales)

Two Roads Diverged in a Yellow Wood and I Took the One Less Travelled by the Path of Leadership for Women in Pakistan
(Author: Abaida Mahmood)

Evaluation of Available Instructional and Human Resources for Early Childhood Education in River State
(Author: Chinyere Catherine Ukala)
Evaluation of Early Childhood Education Programme in Nigeria
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Abstract

The early years in life are the most important for the formation of the intelligence, personality and social behavior of a child. The years before a child reaches kindergarten are among the most critical in his or her life to influence learning. That is why modern societies show serious concern for the education of their young ones by providing needed support to prepare them to succeed later in school (Ejieh, 2006). It is common practice in most societies to make provision for early childhood education programmes of various sorts for children below the official school-going age (usually 6 years) mainly to prepare them for education in primary schools (Obidike, 2012). The Federal Government of Nigeria recognizes the importance of early childhood education in Nigeria, and as a result it was given prominence in the National Policy on Education [6] as one of the programmes in the Nigerian educational system. This paper sets out to evaluate the early childhood education programme in Nigeria. It looks at its objectives and its curriculum. The extent of the achievement of these objectives is as important as the implementation of the curriculum. It also looks at the model of evaluation called Context, Input, Process and Product model. The study employs the survey research design and the area of study is Abia State in Nigeria. It has a population of over 20,000 and uses a sample of 1350 respondents which was got by stratified multistage sampling technique. Four research questions and one hypothesis were posed to carry out the research work. Research instruments used for the study include questionnaire, observation and interviews conducted on the respondents. The data collected were analyzed using frequency, percentages and chi square analysis. The results of the analysis show that the programme objectives were achieved to a high extent, though the objective of provision of adequate care was not fully achieved. The objective of teaching them in their mother tongue was also not achieved. The study also discovered that there are constraints to the achievement of the objectives of the early childhood education programme especially that of funding. Some recommendations were made which include that effective measures should be ensured in the training of early childhood/pre-primary education teachers through adequate scholarships, approving the mounting of such programmes in all Universities, Institutes of Education and Colleges of Education. Moreover, if Nigeria wants to achieve the objectives of education for all, there is a need for Early Childhood Education to cover children of 0-3 years, though some early childhood education centres make provision for what is called pre-nursery which is for 2 year olds.

1. Introduction

Education being as important as it is both to the individual’s development and national development, should be the prerogative of every individual as well as the nation. Education which remains the gateway to national development should be given its pride of place in the lives of citizens, right from the cradle. Moreover, it is a process that starts from birth to death. It is obvious from the need for education to start from birth that most nations in the world including Nigerian advocate for Early Childhood Care Development and Education (ECCDE). Most nations and societies now show much concern for the education of the young ones by providing needed support to prepare them to succeed later in life. This creates the need for nations to make provisions for early childhood education programmes of various types for children below the official school-going age of six years. Hence the Federal Government of Nigeria gives Early Childhood Education a prominent place in the National Policy on Education [14] as one of the programmes in the Nigerian educational system. ECCDE aims at fostering the proper development of children, identifying and addressing their problems, harnessing their potentials, moulding their character, enhancing their learning, equipping them for life so that their actions are channeled towards positive personal, communal and global development in all ramifications. Based on the need for education in general and childhood education in particular, the Federal Government of Nigeria [6] lays emphasis on childhood education in the National Policy on Education by giving it a full section in the national policy (FRN 2004: section 2). It is for this reason that the researcher decided to investigate the extent of implementation of this section of the National Policy on Education.

The scope of this research work is the pre-primary/childhood Education which spans through 3-
5 years and takes place in a formal and organized classroom.

2. Origin of Early Childhood Education in Nigeria

Education in Nigeria started with informal education where children no matter their ages had to watch adults do things and do as the adults do. Organized education of the child below the formal primary school age did not receive official recognition until very recently. Before the formal introduction of childhood education in the 20th century, children received a form of organized education in church buildings, private houses and village halls. Early childhood education as we know it today in Nigeria is largely a post-colonial development. The semblances of it during the colonial era were the kindergarten and infant classes, which consisted of groups of children considered not yet ready for primary education. The grouping for instruction in schools then was not based on age, hence children aged, six years and above could be found in the infant classes [24], [25]. It was for the first time in 1977 with the introduction of the National Policy on Education [14] by the then military government of Nigeria that the importance and need for early childhood education was given official recognition and linked with the child’s educational performance in primary school. Gradually early childhood education came to stay and by 1985, Nigeria had about 4200 early childhood institutions while by 1992, the number had increased to about 8,300 [24]. As at now the number has increased to 20,000 given that every primary school both private and public houses a pre-primary section in line with the National Policy on Education directive.

These days, early childhood education institutions are located in various places and buildings, campuses of universities and colleges, premises of some industries and business organizations, church premises residential buildings. There has been unprecedented expansion of facilities owing to the high demand for early childhood care and education by parents [4].

Okewole, Iloezi-Ogbedu and Osinnowo [20] gave the origin of early childhood education in Nigeria by saying that the current practice of early childhood education has deep historical roots on philosophical views of great philosophers. The welfare of children and their educational needs have been a great concern on a large group of adults of different times in history. Plato (427 – 347 BC) was the first person to classify education into the formal levels as we now know them Oduolowu [17]. Plato suggested a design of education for children from birth to age six. He said that learning should be a sort of amusement [7].

According to Fafunwa [5], the first Europeans to set foot on Nigeria were Portuguese during their first missionary journey. That was as early as 1472, Portuguese merchants visited Lagos and Benin and exchanged greetings with the Oba of Benin. Fafunwa [5] went ahead to say that spasmodic missionary activities started in Benin in 1515 when some catholic missionaries set up a school in the Oba’s palace for his sons and the sons of his chiefs who were converted to Christianity. Another account given by Fafunwa in 1997 [5], has it that the first known school was established by Mr & Mrs. De Graft in Badagry in the 1840’s and was named “Nursery of the infant school”.

Kolawole [8], quoted by Okewole [19], says that early childhood education in Nigeria dates back to 1879, and that for a long time, it remained church-based. This is also corroborated by Oduolowu [17] that early childhood education started as Sunday school classes but was later formalized in Nigeria. The classes were held between Monday and Friday like formal schools. She went ahead to say that with the influx of foreigners who came to Nigeria to work, more of the pre-schools were established in Government Reservation Areas (GRA) for the children of these foreigners and a few Nigerians who had travelled abroad and knew the importance of this level of education. Akinbote [1] pointed out that such pre-schools later became part and parcel of primary schooling. The classes were called infant classes I and II. Children passed through them before proceeding to the standard forms. They existed in the same buildings with primary schools.

2.1. Concept of Early Childhood Education

Like every other concept, early childhood education has been variously defined by various scholars. Maduewesi [10] defines early childhood education as the education offered to children who have not yet reached the statutory age of beginning primary school. He further maintained that it is a semi-formal education arrangement, usually outside the home whereby young children from about the age of three years are exposed through play like activities in a group setting through mental, social and physical learning suited the mandatory age of government approved formal schooling. FRN (2004) refers to Early Childhood Care and Education (pre-primary education as an education given in an educational institution to children aged 3-5 years plus prior to their enrollment in the primary school. Pre-primary education or early childhood education serves as a foundation upon which other levels of education are built. This level of education is usually generally accepted as the education given to children between 0 – 6 years.
3. The Concept of Curriculum

Oyekan[22] revealed that the concept of curriculum has undergone marked changes during the 20th century without any plausible agreement on an appropriate universal definition. McDonald [12] defined curriculum as “planned action for instruction”. Lawton [9] viewed curriculum as “a selection from the culture of society”. One scholar says that curriculum is the totality of experiences of each learner under the influence of the school. Another also defined curriculum as series of things which children and youths must do and experience by way of developing ability to do things well which make up the affairs of adult life. This researcher wishes to extend the definition of curriculum by seeing it also as a series of planned learning experiences expected of a child at any given level of education.

3.1. The Concept of Curriculum Evaluation

The processes, strategies and techniques employed to adjust and control the gap between the planned activities and the actual outcome of instructions are what are referred to as curriculum evaluation [3]. There are different models of evaluation which include the CIPP model by Stifflebean. The main components of CIPP are C – Context, I – Input, P – Process and P – Product. Next is EIPOI. EIPOI is a modification of the CIPP model. EIPOI represents Environment, Input, Process, Outcomes (Immediate and long-range outcomes) and other intermediary outcomes at a program and long-term impact of the program on both the educational and socio-economic domains. There is also the CIPO which is a combination of the ideas in CIPP and EIPOI formulated by Yoloye One study, CIPOI represents Context, Input, Process, Outcome and Impact. Others are the goal oriented/objective-based Evaluation Model by Ralph Tyler and the Goal-free/Responsive Evaluation models by Scriven.

4. Quality and Qualification of Teachers

The quality of the teachers determines the strength of any educational system and the value of the learners (Okoro) [21]. In Nigerian early childhood education today, the teacher quality is gradually going down generally. It is only a few of the nursery schools, especially those owned by educational institutions, private companies and wealthy individuals that can afford to engage the services of university graduate teachers and holders of Nigerian Certificate in Education (NCE) qualifications (competent and committed teachers), and are also capable of retraining such teachers. Most others employ a few NCE teachers (if any) who are usually underpaid, while others employ mainly Grade Two teachers and secondary school leavers with West African School Certificate or General Certificate of Education, GCE (ordinary level) qualifications. In a situation where most of the teachers in our early childhood institutions are unqualified and/or unprofessional, effective teaching and learning cannot be achieved.

4.1. Objectives of Early childhood education

The objectives of early childhood education in Nigeria according to the National Policy on Education FRN [14] are to

(a) effect a smooth transition from the home to the school;
(b) prepare the child for the primary level of education
(c) provide adequate care and supervision for the children while their parents are at work (on the farm, in the markets, offices, et c.);
(d) inculcate social norms;
(e) inculcate in the child the spirit of enquiry and creativity through the exploration of nature, the environment, art, music , playing with toys, et c.;
(f) develop a sense of cooperation and team spirit
(g) learn good habits, especially good health habits; and
(h) teach the rudiments of numbers, letters, colours, shapes, forms, et c. through play.

Mezieobi, John-Nwosu and Opara[13] say that these objectives will amount to sheer prescription on paper or a good intent for preschoolers if nothing tangible is done to realize them.

4.2. Basic Curriculum Provision

Government in order to achieve these objectives of pre-primary education has chosen to encourage pre-primary education undertakers to:

1. Encourage private efforts in the provision of pre-primary education.
2. Make provision in the teacher training institutions for student teachers who want to specialize in pre-primary education.
3. Ensure that the medium of instruction will be principally the mother tongue or the language of the immediate community.

For this purpose, government plans to:

(i) Develop the orthography for many more Nigerian languages; and
(ii) produce textbooks in Nigerian languages.

4. Ensure that the main method of teaching at this level will be through play, and that the curriculum of teacher training colleges is appropriately oriented to achieve this;
5. Regulate and control the operation of pre-primary education as well as ensure that the staff of pre-primary institutions are adequately trained and that essential equipment is provided [14].

In addition to the foregoing, appropriate levels of government will review and enforce the educational laws which relate to the establishment and operation of Nursery schools. This is to ensure that the schools for preschoolers are well run. Inspectors from the Ministry of Education will on regular inspectorial or supervisory basis visit the pre-primary schools for the purposes of maintaining high standards (NPE [14]).

With regard to how government has fared in its part in the realization of the pre-primary education agenda, participant observers will attest that generally government has continued to pay passing attention to pre-primary education, as what government intends to do in the direction of the realization of the objectives of pre-primary education are not in actuality given any commendable attention. Put quite succinctly, government has near completely neglected pre-primary education in Nigeria irrespective of its acclaimed world-wide significance in the development of the child-preschooler

4.3. Importance of pre-primary education

The significant attention which government, and in fact the majority of parents of preschoolers in Nigeria, is giving to pre-primary education does not in any way defame the importance of pre-primary education.

It is generally agreed that there are only two functions of pre-primary education. These are the custodial function and the preparatory ground role of pre-primary education. The custodial function of pre-primary schools is real as it favours working mothers and others whose busy economic engagements and more leave them with no adequate and quality time to attend to the development needs of the child at home. Similarly, the exposure of the child to preschool experiences equips him for the smooth excursion to the primary school proper without much adjustment problems.

Pre-primary education, however, performs much more than custodial and preparatory ground for primary education functions. The other functions or importance of pre-primary education include:

1. The play facilities – materials and equipment – which the preschoolers are exposed to facilitate their physical development if appropriately utilized. In addition, the effect of adequate provisions of play materials and equipment on the good health of the preschooler needs no emphasis.

2. Children from different and varying backgrounds begin very early in their lives to play together and in addition work together and begin to cooperate with one another in team spirit.

3. In pre-primary schools, language skills – listening, speaking, reading and writing – are gradually acquired and these language skills are very inevitable for success in the next stage of schooling – primary school - and in later stages of school and in fact in the pupils’ communicative interaction with others in adult life.

4. Pre-primary schools further enhance the acquisition and development of social habits and social norms.

5. The love and care which are showered on the preschoolers by the pre-primary school management help in the emotional development of the preschoolers.

6. The unrestricted interaction of preschool peers in the preprimary educative environment, coupled with their cooperation and team work make the children of preschool age acquire social skills which are very inevitable for effective social living in the years that lie ahead of the new preschoolers. While fostering the child’s social development, anti-social behaviours are also curbed or stemmed quite early in the life of the preschooler who is exhibiting gems of moral or social inadequacies/deficiencies.

7. The stimulating environment which is everywhere pervasive in good pre-primary schools equips the child with sound intellectual capacities. This is in accord with Bloom’s findings that 80% of preschoolers’ intellectual development takes place between ages 4 and 8. John-Nwosu [13] lent credence to the intellectual development function of pre-primary education when she noted that “the nursery school provides a good environment for sound intellectual development”.

8. Pre-primary schools instill discipline in the preschoolers through their use of authoritative strategies of child-rearing which efficacy has been established by in another study.

9. Nigeria is saddled with a bewildering array of social, political, economic and technological problems that are significantly exerting adverse influences on child development and the subsequent quality of the future adults who will definitely be products of the new pre-primary schools. It is the contention of one researcher that “early childhood education can be an appropriate intervention strategy to address the many problems that Nigeria is confronted with.

Apart from the foregoing positive functions of pre-primary education, more successes can be recorded by the pre-primary schools if the preschoolers are exposed further to these experiences. They are:
1. Giving them adequate chances to express themselves;
2. The preschool managers seeing things from the point of view of the child;
3. Allowing the children to imitate reasonable activities;
4. Parents responding to pre-schools and their inmates in supportive ways;
5. Stimulating and motivating the preschoolers very regularly;
6. Helping children develop the feeling that they can produce results; and
7. Talking to the children, encouraging and explaining things, experiences to the child.

To realize these lofty objectives, early childhood education was designed along the aforementioned objectives by Nigerian Educational Research and Development Council and recommended for use by all early childhood education centres. However it should be noted that private individuals and private organizations have been officially licensed to provide early childhood education while government will provide measures to engender quality control and assurance in the system, though of recent, government especially at the state level has embarked upon establishing early childhood education centres in every public school in Nigeria. It is however not certain whether these early childhood education centres are operating within the context of NERDC curriculum.

5. Statement of the problem

Early childhood education has been designed to enhance the quality of children’s lives and their society. Participants at the World Conference on Education for all in Jomtein in 1990 pledged to provide primary education for all children and massively reduce illiteracy by the end of the decade. This was followed up in the year 2000 with Dakar Framework for Action on Education for All. Nigeria as a country was part of this conference and a signatory to every decision reached. As part of her efforts towards improving the quality of life of children, besides incorporating early childhood education in the National Policy on Education [14], a comprehensive Early Childhood Education curriculum was designed for implementation to equip the children with the desired skills needed for effective primary education and social life. It is now uncertain whether schools are implementing the curriculum and achieving the objectives. It is on this premise that the thrust of this paper is predicated to evaluate the extent of implementation of early childhood education curriculum especially in Abia State of Nigeria.

5.1. Purpose of Study

The purpose of this study is to evaluate the extent of implementation of Early Childhood Education curriculum in Nigeria specifically in Abia State. The specific purposes of this research work are to
(i) investigate the quality of teachers involved in the implementation of Early Childhood Education curriculum
(ii) evaluate the adequacy of the teaching and learning facilities.
(iii) Compare the expected curriculum with the observed curriculum.
(iv) ascertain the constraints (if any) to its implementation

5.2. Research Questions and Hypotheses

The following research questions and hypotheses were posed to carry out the study. The hypothesis is analyzed at 0.05 level of significance.

Research Question 1
To what extent do the early childhood education centres make use of and implement the Nigerian Education Research and Development Council (NERDC) recommended curriculum/objectives.

Research Question 2
What are the constraints to implementing the NERDC curriculum by these centres.

Research Question 3
To what extent do the early childhood education centres employ qualified teachers and care givers.

Research Question 4
To what extent do the early childhood education centres make use of the mother tongue as a medium of instruction?

HO:
There are adequate provisions of teaching and learning facilities at the Early Childhood education centres.

5.3. Method of Data Analysis

The data collected is analyzed using percentages and chi square.

5.3.1. Methodology

The study employed the survey research design. The population of the study includes all the early childhood education centres in Abia State (both private and public). Out of the seventeen(17) local government areas in Abia State only five (5) local
government areas were randomly sampled; out of the 5 local government areas, 5 schools were sampled, (one from each local government area) for the study. The sampling technique used was stratified multistage sampling technique. The research instruments used were observation, check list and questionnaire. The questionnaires and checklist were given to evaluation experts for content validation. In areas where errors were noted, corrections were effected. The reliability of the three instruments including structured observation schedule were checked appropriately and the following coefficients were obtained – 0.82, 0.78 and 0.88 indicating the reliability adequacy of the instruments. All the instruments were administered by the researcher and five other research assistants who were duly trained. Data collected were analyzed using frequency count, percentage and chi’ statistics. Five schools were also sampled to investigate the availability of facilities and NERDC recommended curriculum.

5.3.2. Results

To guide this investigation, the research questions are hereby answered.

Research Question 1

To what extent are the early childhood education objectives achieved. A total sample of 1350 respondents were used which include head teachers, teachers UBE officials, pupils and parents.

The result as shown in Table 1, these responses, were got from analysis of the classroom observations, interviews and questionnaires distributed to the early childhood education teachers, school proprietors, parents and head teachers.

The result shows that the programme objectives were achieved to a high extent except the one on provision of adequate care and supervision for children which has 68.74% for yes and 31.26% for no.

Table 1. Percentage analysis of the extent of achievement of the objectives of the early childhood education objectives in Abia State

<table>
<thead>
<tr>
<th>S/No</th>
<th>Early Childhood Education Objective</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Effective &amp; smooth transition from home to school</td>
<td>Yes</td>
<td>1137</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>243</td>
<td>18.00%</td>
</tr>
<tr>
<td>2</td>
<td>Prepares the child for primary level of education</td>
<td>Yes</td>
<td>1254</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>104</td>
<td>7.54%</td>
</tr>
<tr>
<td>3</td>
<td>Provides adequate care and supervision for children</td>
<td>Yes</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>828</td>
<td>6.32%</td>
</tr>
<tr>
<td>4</td>
<td>Inculcates the spirit of enquiry and creativity</td>
<td>Yes</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>524</td>
<td>38.26%</td>
</tr>
<tr>
<td>5</td>
<td>Inculcates social norms</td>
<td>Yes</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>53</td>
<td>42.52%</td>
</tr>
<tr>
<td>6</td>
<td>Develops the sense of cooperation and team spirit in children</td>
<td>Yes</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>528</td>
<td>39.05%</td>
</tr>
<tr>
<td>7</td>
<td>Teaches good health, especially good health habits.</td>
<td>Yes</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>523</td>
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From Table 2, it can be observed that 59 of the teachers say that the use of mother tongue as a medium of instruction has not been consistent. In the same vein 823 of the pupils/parents agree with this attestation. On the other hand, 31 teachers and 437 pupils/parents say that the use of mother tongue as a medium of instruction in the early childhood education centres has not been consistent. A close interaction and observation with the respondents showed that English language is majorly used for instruction instead of mother tongue. Some however, submitted that apart from English language as a school subject, all other subjects are taught using the local languages of the various communities used for the study. The use of English language was noted to be prevalent in the urban centres, partly because of the preference of parents who want their children to be taught in English.

Research Question 3

What are the major constraints facing the full implementation of early childhood curriculum/objectives?

Table 3. Percentage analysis of the major constraints to the full implementation of the curriculum/objectives of the early childhood education

<table>
<thead>
<tr>
<th>S/No</th>
<th>Constraining Factors</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate funding</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>2</td>
<td>Lack of qualified teachers</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>3</td>
<td>Poor monetary</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>4</td>
<td>Inadequate instructional materials</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>5</td>
<td>Poor infrastructure</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>6</td>
<td>Lack of relevance</td>
<td>97.50%</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

The data in table 3 were obtained from all the respondents used in the investigation. They see the itemized constraining factors as threats to the full implementation of the early childhood education curriculum/objective achievement. This confirms the findings of another researcher who discovered from a similar study that lack of attention, especially in the
area of funding is responsible for the failure of the programme in Plateau State in Nigeria

Research Question 4

Do the teachers and caregivers at the early childhood education centres have the minimum qualifications which is the National Certificate of Education (NCE)?

Table 4: Percentage Analysis of Early childhood caregiver possession of the minimum qualifications for the job

<table>
<thead>
<tr>
<th>Qualifications</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>BED</td>
<td>175</td>
<td>12.96%</td>
</tr>
<tr>
<td>NCE</td>
<td>375</td>
<td>29.77%</td>
</tr>
<tr>
<td>TCTI</td>
<td>900</td>
<td>66.66%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1350</td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4 shows that majority of the teachers and caregivers at the early childhood education centres do not have the minimum qualifications to teach and provide care for pre-primary children. This is evidenced as only 12.96% of the teachers and caregivers have Bachelors degree in Education; 29.77% have National Certificate in Education which is the minimum qualification for the teachers and caregivers in the early childhood education centres.

Hypothesis I:

There is adequate provision of teaching and learning facilities at the Early Childhood Education Centres in Abia State Nigeria.

Shows the quantity rating scale of provision of teaching and learning facilities at Early Childhood Education Centres in Abia State. Let c equal the number of columns. Since we are also considering another variable, let r equal the number of rows. Thus, df=(c-1)(r-1) or (5-1)(5-1) = 16 and with level of significance, the critical value of chi square is 26.296.

If \( \chi^2_{\text{obs}} \) = 26.296, reject \( H_0 \).
If \( \chi^2_{\text{obs}} \) = 26.296, do not reject \( H_0 \).

Table 5: Chi Square Analysis of the adequate provision of teaching and learning facilities at the early childhood education centers in Abia State

\[
E_{jk} = \frac{(R \text{ marginal} \times C \text{ marginal})}{N}
\]

Substituting the values in the formula gives the figures in bracket in the contingency table below:

Table 6: Chi Square Analysis of how teaching and learning facilities affect the quality of instruction in Early childhood Education

<table>
<thead>
<tr>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playground 2(62.1)</td>
<td>3(67.7)</td>
<td>-41.4</td>
<td>4(38.9)</td>
<td>-41.4</td>
<td>9</td>
</tr>
<tr>
<td>Classroom 2(86.7)</td>
<td>2(60.9)</td>
<td>4(59.1)</td>
<td>2(36.1)</td>
<td>2(39.8)</td>
<td>13</td>
</tr>
<tr>
<td>Instruction facilities 3(130.9)</td>
<td>4(84.9)</td>
<td>2(75.1)</td>
<td>2(39.9)</td>
<td>5(25.3)</td>
<td>16</td>
</tr>
<tr>
<td>Resting/Sleeping facilities 2(19.1)</td>
<td>2(16.4)</td>
<td>5(50.9)</td>
<td>2(37.4)</td>
<td>2(38.6)</td>
<td>11</td>
</tr>
<tr>
<td>Toilet Facilities 2(138.0)</td>
<td>2(106.1)</td>
<td>5(52.0)</td>
<td>5(86.3)</td>
<td>5(52.0)</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong> 10</td>
<td>13</td>
<td>15</td>
<td>16</td>
<td>15</td>
<td><strong>69</strong></td>
</tr>
</tbody>
</table>

Consider the following data above; contingency table on adequacy of facilities in the schools understudied.

Summation of these figures in bracket gives;

\( \chi^2_{0.05} = 1536.59 \)

Since \( \chi^2_{0.05} (1536.59) > \chi^2_{\text{crit}} (26.296) \), we reject \( H_0 \) and conclude that adequacy/provision of facilities does not affect the quality of instructions given.

6. Discussion

This study is designed to evaluate the implementation of early childhood education curriculum with a view to investigating the quality of the personnel; finding out the adequacy of the teaching and learning facilities; comparing the expected curriculum with the observed curriculum and finally ascertaining the constraints to the implementation of the curriculum. One hypothesis was used while four research questions were also used for the study to provide answers to guide in evaluating the implementation of early childhood education in Abia State.

Going by the evaluative research carried-out in the five schools of different local government areas, the personnel involved in the implementation of early childhood education curriculum as prepared by NERDC are not adequately qualified to teach or provide care for the children at the centres. Out of
the 1350 respondents (i.e. teachers and care-givers) only seven of them have the minimum qualification to teach at the centres. This implies that if unqualified personnel flood these centres then we should not expect anything laudable as far as teaching/learning is concerned. The result of these findings corroborates the earlier findings of Maduewesi and Nneji [10] when they carried out a similar research in Abuja.

Similarly, the teaching/learning facilities at these centres are not adequate. The classrooms, playgrounds, resting/sleeping facilities and a lot of others are all in appalling states, begging for repairs and upgrading. Some of these centres are using residential buildings converted into schools. Some centres do not even have any space that could be called playground whereas children at this level cannot stay in the classroom for long but desire to play and that is why the NPE [14] recommends play-way method for these children. After play, these children would be expected to have a place to rest or sleep. Unfortunately, most of the centres according to this study do not have adequate resting/sleeping space.

It is also revealed in this study that only 1 school out of the 5 schools used for the study has the recommended curriculum i.e. NERDC curriculum.

Other schools claimed ignorance of the existence of any national curriculum for the early childhood education in Nigeria. This means that these schools that are not having the national curriculum are only using “a self-developed school curriculum” most of which activities and experiences are not in accordance with the recommended curriculum. This also lends credence to Maduewesi and Nneji’s[10] report that no single centre visited had curriculum but rather presented scheme of work when asked to bring out the curriculum they were using.

The responses derived from the questionnaire reveal that some of the major constraints the personnel at these centres are facing are: poor management and leadership styles from both the proprietresses/proprietors and their head teachers who are not always ready to release them during holidays to attend in-service training programmes, workshops, seminars or even conferences that could have helped develop them professionally. Also, it was also discovered that most schools do not have a good welfare package for their staff, and this would invariably affect their performance during the teaching/learning process. Besides, the respondents also complained about the provisions of the National Policy on Education [14] as regards Pre-primary Education in Nigeria especially in the use of mother-tongue or the language of the immediate environment. Majority of the parents of these children want their children to be taught in English Language which is contrary to the National Policy on Education [14] which invariably has not been helpful in the successful and adequate implementation of the NERDC curriculum.

7. Recommendations

Going by the situation on ground at the various centres, it is expected that if the measures recommended below are taken and implemented, they would go long way to improving the quality of E.C.C.E. curriculum in the state in particular and the nation as a whole:

- The NERDC recommended curriculum should be given better and wider publicity by the various levels of government right from the federal to the state and local government areas.
- Early childhood education as a course should be introduced at the colleges of education in the country. Only very few ones are offering it presently.
- Frequent supervision of these centres should be carried out by the agencies or inspectorate at every level to ensure adequate compliance with prescribed national and international standards.
- Urgent review of the National Policy on Education [14] provisions on early childhood education as regards some aspects such as the language used for instruction. Since the parents are clamouring and pressuring the centres to use English Language instead of the mother tongue because Nigerian societies are heterogeneous, then government at the centre controlling education has to do something about this issue to be in compliance with the current reality.
- The welfare package of personnel at these centres should be looked into and improved upon to elicit better performance from them.

8. References


When the Extra Mile Makes the Difference:  
Teacher Training and the Effectiveness of Add-Ons 

Emily Gonzales 
Social Impact - United States

Abstract

In Sub-Saharan Africa, most children are not able to read at their grade level. Limited numbers of trained teachers have been a core reason for low reading skills at primary levels, and many primary education-focused interventions aim at improving teacher skills through teacher trainings; but other country-specific barriers also exist. This extended abstract discusses three ongoing evaluation examples from Malawi, Somalia, and Kenya where teacher trainings are augmented with a variety of additional activities to improve reading skills. Reading scores increased with intervention in Malawi and Somalia, but declined in Kenya. What explains the results? Through in-depth quantitative and qualitative analysis, the paper concludes that improving teaching skills through teacher trainings is necessary but not sufficient alone to adequately increase primary reading skills. Teacher trainings need to be complemented with additional activities that address other relevant barriers such as the lack of economic and educational resources. To do this, the add-ons should be well chosen based on context-specific needs assessments and a clear theory of change framework.

1. Introduction

In Sub-Saharan Africa, primary-level reading skills are very low and despite more children going to school, most are not able to read at their grade level. Reaching an adequate, primary level of reading strongly influences children’s ability to stay in school and progress to higher schooling levels, and impacts their income earning potential in the future.

The very limited number of trained teachers has been a core reason for low reading skills at primary levels. Therefore, many primary education-focused interventions aim at improving teacher skills through teacher trainings; but other country-specific barriers also exist that amplify effects of limited trained teachers. In such cases, teacher trainings need to be augmented with other activities to improve student reading skills. What add-ons to teacher trainings work the best?

The three education evaluations, shown in Table 1, provide three unique examples to help answer this question. Among other things the table identifies the key barriers to learning in each of the three cases. All three evaluations are still on-going. Current results shown in the Figures 1, 2, 3, and Table 2 ultimately indicate that to be effective, activities must be developed around the main goal of the intervention (in this case, improving reading skills) based on a clear theory of change framework.

![Figure 1. Malawi reading scores (correct words per minute)](image1)

![Figure 2. Somalia reading scores (out of 10)](image2)

![Figure 3. Kenya reading scores (out of 40)](image3)
2. Body of Knowledge

Learning assessments were conducted using universally accepted tools two years after intervention among a large sample of randomly selected students drawn from grades that ranged from 2 to 6 in all three countries (but, varied in each country). The sampled students were well balanced in their characteristics, and time trends and any possible contamination and spill overs were controlled for in the analysis. While scores increased with intervention in Malawi and Somalia, they declined in Kenya (Figures 1, 2 and 3). What led to the results? From the Figures and Table 2 above, we can infer the reasons as follows: In Malawi, students in treatment schools were able to read about 1.7 words more per minute than students in comparison
schools. While teaching skills and length of school day did not differ much with intervention, class sizes reduced thereby improving attention given by teachers to students. In Somalia, students scored an average of 2.5 points better after receiving the intervention (out of 10). After the intervention, more teachers were exhibiting essential teaching skills and 33.5% of girls in the study were receiving financial support to pay for school fees, and 100% of the girls were given the opportunity to work with their female teacher mentor. The combination of these activities allowed more students to attend and stay in school and be confident once there, and learn from better-skilled teachers. In Kenya, students in intervention schools scored about 0.9 points less than in control schools (out of 40). The project worked to increase general teaching skills and provide better teaching materials. However, the instructional DVD libraries contained mainly science-based content, not reading-based content. Thus, even though the skills of trained teachers far exceeded those who did not receive training, the training tools provided to teachers were disjointed from the intended outcome - to improve reading skills - consequently the outcome was not achieved.

3. Conclusion

The key takeaway of this paper is that improving teaching skills through teacher trainings is necessary but not sufficient to adequately improve primary reading skills. In Kenya, the teachers were well trained, but the add-on content was not catered towards the desired outcome as it did not focus on primary reading. Teacher trainings should be complemented with additional activities that address other relevant barriers, but most importantly the add-ons should be chosen based on context-specific needs assessments and a clear theory of change framework so that they are directly aligned with the program’s desired outcomes.
Two Roads Diverged in a Yellow Wood and I Took the One Less Travelled by the Path of Leadership for Women in Pakistan

Abaida Mahmood  
Qurban and Surraya Educational Trust  
United Kingdom

Abstract

The Chinese leader Mao Zedong once said “women hold half the sky”. This may be true demographically but it is far from reality. According to the patriarchal view of our society, male and female genders are assigned different roles and the individuals are always viewed through ‘lenses of gender’. If women attempt to be assertive or authoritative then they are labelled “unfeminine”. Women leaders walk a tight rope to reach a position of influence and power.

Lack of education and economic opportunities for women restrict the potential of women to think about their due rights. Furthermore, poverty and religious extremism are also roadblocks in the way of Pakistani women becoming progressive and independent. Women in Pakistan are highly connected with the honour of men. Men normally control their movements and behaviour whether he is a father, husband or brother. The women of Pakistan will have to go a long way before they are able to get their rights in Pakistan.

This paper examines the stereotypes of female leadership and how culturally driven gender roles of women impact their career choices and professional advancement in organizations. A few women who have succeeded to reach an executive or other professional position pay a price for such a success with personal sacrifices including delaying motherhood or remaining childless. In developing nations like Pakistan, women students earn more college degrees than men, but their abilities in the workplace are undervalued. Solutions to closing the gap are discussed.
Evaluation of Available Instructional and Human Resources for Early Childhood Education in River State

Chinyere Catherine Ukala
University of Port Harcourt, Nigeria

Abstract

This study evaluated the availability of instructional and human resources for early childhood education in River State, Nigeria. Analytical survey design was used to provide relevant information for the research questions and two hypotheses posed. Through stratified random sampling technique, the head teachers of early childhood education centers from 165 public and 87 approved private primary schools comprised the research subjects. The instrument (EAIHRECEQ) was administered to all the head teachers of the mentioned centers. The data gathered using the instrument was organized and analyzed using mean, frequencies, ratio, standard deviation and t-test at 0.05 significant level. Findings revealed among others that instructional resources in form of charts and toys are grossly inadequate in public schools but moderately adequate in private schools. There is adequate supply of teachers and minders in both public and private schools, even though this supply is significantly more adequate for public schools. Unfortunately, these personnel were neither trained nor exposed to early childhood pedagogy. Based on the findings, some recommendations were made.

1. Introduction

Availability of resources, whether human, material or financial is critical to the successful implementation of any educational programme. This is because resources are needed to provide a conducive teaching and learning environment, purchase the relevant instructional and learning materials and pay school system staff encouraging remuneration.

The quantity and quality of resources available for any educational programme would therefore determine school system’s capacity for the provision of the type of education in question, as well as its quality. Quantitatively, school system capacity determines the number of school children that can be accommodated in any particular educational programme, based on some minimum defined standards of quality. Many educational programmes had failed in the past as a result of inadequate availability of resources. For effective implementation for early childhood education, well trained and qualified teachers, minders and pediatric nurses are the most important fundamental resources. As observed by [5] the demand for teachers in schools is determined by school enrolment. The Universal Basic Education (UBE) programmes no doubt like the previous UPE schemes, is expected to stimulate astronomical explosion in pupil enrolment. This is even truer for a new programme introduced into the public school system like the early childhood education.

The National Policy on Education stipulates that for effective handling of children in the school system, the teacher-pupil ratio should be 1:25 for the early childhood education [6]. This is a standard basis for determining teacher and other personnel requirement in these schools. [9] stated that under-estimation of school enrolment and inability to determine in advance resource requirement is one of the reasons for the failure of previous UPE schemes to get the required number of qualified teaching manpower for its implementation. In agreement with this, [4] suggested that the (UBE) must begin a proper implementation programme by carrying out a realistic teacher requirement estimate.

Theoretically, [16] noted that the demand for teachers for preprimary education, just like any other level of education, will continue to be determined by demographic fluctuations, shifts in curricular emphases (from Arts to Science subjects) and alterations in policies related to teacher education. They agree with [16] that teacher retirement and attrition, increasing immigration, decreasing enrolment in teacher training institutions, will continue to increase the number of pupils/students and decrease pupil-teacher ratios, and thus the need for more teachers. Although these analyses reflect the situation in advanced societies, it is a pointer to what we should expect in poor societies.

The inadequacy of qualified teachers for school enrollment ranges from poor professional status of teachers to even lack of fresh recruitment to fill empty vacancies [11]. [15] agreed with the above view as they asserted that there are not enough qualified teachers in Nigeria; and that this has negative outcomes, not only for the future of individual children, but also for the development of the society.
Shortage of qualified teachers and other school system staff like minders, nurses and other care givers in the educational system has become the main challenge to the realization of the goals of the UBE. Some of the reasons given for the dearth of teachers in the educational system include dissatisfaction with loss in status, low salaries, poor conditions of service, lack of career progression, poor training and re-training schemes [11]. These conditions in many cases have driven large number of teachers out of the profession, sometimes after only a few years of service; resulting to brain drain and high attrition rate. Most of the teachers now in the system are young, inexperienced, insufficiently trained, teachers lacking the necessary qualities for membership or role modeling [11].

Various published scholars have highlighted that the failure of previous projects has been due to the use of untrained and inadequately qualified teachers and in some cases lowering the entry levels of teacher training institution amongst other factors which subsequently reduced the quality of educational standards. All these have jeopardized the quality of education delivery which has resulted to poor standard of educational provision.

2. Statement of the Problem

In response to the above development, government of Rivers State, Nigeria through the UBE Board is now incorporating early childhood education programme into the UBE school programme. The researcher, just like many interested parents, is curious whether these centers housing early childhood education have the resource availability to implement this programme successfully as identified above. It is not even known what the level of resource availability is in private schools that have been providing this level of education. This is the problem which this study seeks to address.

2.1. Aim/Objective of the Study

The aim of this study is to evaluate the availability of instructional and human resources for early childhood education programmers in Rivers State. Specifically, the objectives of this study are to:

- Evaluate the availability of instructional resources in both public and private schools for the provision of early childhood education in Rivers State.
- Evaluate the availability of human resources in terms of teachers and minders for the provision of early childhood education.

2.2. Research Question

1. What are the instructional resource availability for the provision of early childhood education in public and private schools in Rivers State?
2. What is the human resource availability for the provision of early childhood education in public and private schools in Rivers State?

2.3. Hypotheses

The following hypotheses were tested at 0.05alpha level.
1. There is no significant different between public and private schools in the instructional resources availability for the provision of early childhood education in River State.
2. There is no significant different between public and private schools in the human resources availability for the provision of early childhood education in River State.

2.4. Methodology

This is an analytical survey. The population consisted of 655 public and 271 approved private schools with early childhood centers spread across the 23 L.G.A. of Rivers State. A stratified random sampling technique was used in sampling 50% of the L.G.A.’s (giving 12 L.G.As.) and 50% of public and private primary schools with early childhood education centers in the sample giving a total of 165 public and 87 approved private schools respectively.

Evaluation of Available Instructional and Human Resources for Early Childhood Education Questionnaire” (EAIHRECEQ) was adopted and modified with some relevant items from “school system diagnostics instrument”. The data generated using this instrument was organized and analyzed using mean, ratio, frequencies, standard deviation and t-test at 0.05 significant levels. The instrument was administered personally by the researcher with the assistance of some primary school head teachers who were sufficiently briefed for the assignment.

2.5. Result and Discussion

1. What are the instructional resources availability for the provision of early childhood education in public and private schools in Rivers State?
Table 1. Frequency and Percentage Distribution of Public and Private Early Childhood schools by their Instructional Resource Availability

<table>
<thead>
<tr>
<th>S/N</th>
<th>Instructional Resources</th>
<th>Standard Specifications</th>
<th>Schools with Standard Facilities</th>
<th>% of Schools with Standard Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public No. 158 Private No. 84</td>
<td>Public  Private</td>
</tr>
<tr>
<td>1.</td>
<td>Library</td>
<td>Classroom size well stocked library</td>
<td>16 63</td>
<td>10.1 75.0</td>
</tr>
<tr>
<td>2.</td>
<td>Library corners in classrooms</td>
<td>Well stocked library corners in the class</td>
<td>16 52</td>
<td>10.1 61.9</td>
</tr>
<tr>
<td>3.</td>
<td>In-door play toys/teaching aids</td>
<td>Like building blocks, gig-saw puzzles, books with copious local illustrations, wall charts, etc. in varieties of shapes and colours</td>
<td>21 72</td>
<td>13.3 85.7</td>
</tr>
<tr>
<td></td>
<td>Aggregate Mean</td>
<td></td>
<td></td>
<td>11.2 74.2</td>
</tr>
</tbody>
</table>

Note: For public schools, virtually only the completed and functioning model schools have instructional resource availability.

The findings revealed that, the proportions of public schools that have these facilities to meet their enrolment are 10.1% for library and library corners in the classrooms and 13.3% for indoor play toys and teaching aids. The private schools on the other hand have very high instructional resource availability, which is represented by 75%, 61.9% and 85.7% respectively for library, stocked library corners and indoor play toys and teaching aids. This high differential is evident by a mean instructional resource availability of 11.2% for public schools and 74.2% for private schools.

Provision of general development of this level of education are met through large and comprehensive unit of materials of instruction that would simultaneously stimulate psychomotor and cognitive development, teach team work, basic knowledge and skills, and integrate psychological and cognitive development. As a matter of fact, pre-school environment, classroom and provision of instructional materials are essential to meaningful interaction. The educational setting must be conducive enough to facilitate children’s interaction with the environment that enables them to acquire knowledge and look for solution outside the box.

2. What is the human resource availability for the provision of early childhood education in public and private schools in River State?

Table 2. Analysis of Teacher Availability and Satisfied Capacity Rates for Early Childhood Education in Public and Private Schools

<table>
<thead>
<tr>
<th>LGAs</th>
<th>No. of Schools</th>
<th>Existing Enrollment</th>
<th>Teachers Availability</th>
<th>Satisfied Available Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. AbualOdual</td>
<td>14 3</td>
<td>1278 310</td>
<td>34 8</td>
<td>66.5 64.5</td>
</tr>
<tr>
<td>2. Degema</td>
<td>12 4</td>
<td>1438 352</td>
<td>48 9</td>
<td>83.4 85.2</td>
</tr>
<tr>
<td>3. Eleme</td>
<td>10 5</td>
<td>814 412</td>
<td>27 11</td>
<td>82.9 66.8</td>
</tr>
<tr>
<td>4. Emohua</td>
<td>7 3</td>
<td>633 278</td>
<td>19 7</td>
<td>75.0 62.9</td>
</tr>
<tr>
<td>5. Etche</td>
<td>16 6</td>
<td>1593 415</td>
<td>41 12</td>
<td>64.3 72.3</td>
</tr>
<tr>
<td>6. Ikwerre</td>
<td>15 5</td>
<td>1725 752</td>
<td>58 19</td>
<td>84.1 63.2</td>
</tr>
<tr>
<td>7. Kana</td>
<td>13 3</td>
<td>1067 432</td>
<td>35 7</td>
<td>82.0 40.5</td>
</tr>
<tr>
<td>8. Obio/Akpor</td>
<td>18 17</td>
<td>1125 2145</td>
<td>40 77</td>
<td>88.9 89.7</td>
</tr>
<tr>
<td>9. Ogba/Egbema/Ndoni</td>
<td>15 8</td>
<td>1048 684</td>
<td>37 20</td>
<td>88.3 73.1</td>
</tr>
<tr>
<td>10. Okrika</td>
<td>9 4</td>
<td>495 374</td>
<td>18 8</td>
<td>90.9 53.5</td>
</tr>
<tr>
<td>11. Oyigbo</td>
<td>10 7</td>
<td>876 1124</td>
<td>30 20</td>
<td>85.7 44.5</td>
</tr>
<tr>
<td>12. Port Harcourt</td>
<td>19 19</td>
<td>855 2414</td>
<td>34 91</td>
<td>99.4 90.1</td>
</tr>
<tr>
<td>Aggregate (Mean)</td>
<td>158 84</td>
<td>12947 9692</td>
<td>421 286</td>
<td>82.6 67.2</td>
</tr>
</tbody>
</table>
This question assessed the human resource availability, for both private and public schools to provide early childhood education in terms of availability of teachers and minders to cope with the existing enrolment in the light of the minimum standard specification. To address this question, the researcher collected enrolment statistics as well as staffing list for the sampled schools in the twelve sampled LGAs. The result of the data analysis is presented in Tables 2 and 3.

The teacher availability for early childhood was judged on the minimum standard specification of 25 pupils per class. Table 2 shows the number of schools sampled, existing school enrolment at this level and the teacher satisfied availability rate in twelve sampled LGAs. The satisfied availability rates here (expressed in percentage) are the ratios of existing teachers available to actual capacity needed to meet the minimum standard specification based on existing enrolment.

From the evidence in Table 2, public schools have high teacher availability for early childhood education centers. This is because public schools satisfied between 66.5% and 99.4% of needed teachers, with an average of 82.6% for the sampled LGAs.

Private schools on the other hand have moderately high teacher availability rates, as they are meeting up between 40.5% and 90.1% of their teacher demand, with an average of 67.2% for the 12 sampled LGAs.

Minders are teaching support staff in the early childhood unit. Minimum standard specification demands that there should be a minder in each classroom. A survey of the availability of both public and private schools to provide adequate minders to meet this minimum standard regulation was also carried out and the result is presented in Table 3.

The evidence in Table 3 clearly shows that while public schools have excess minders in relation to their early childhood pupil enrolment, the private schools are barely meeting up half of their needed minders for their existing enrolment. This is so, since public schools in eight out of the twelve LGAs have exceeded their needed minder capacity (i.e. above 100%) with none of the remaining LGAs meeting below 90% availability (with an aggregate mean of 113.10). private schools on the other hand are only meeting between 48.38% to 67.32% of their minimum requirement for minders, with an average of 54.84% across the twelve sampled LGAs. This evidence shows a widening gap between public and private schools in favour of public schools. This is better appreciated with a pictorial representation as shown in Figure 2.

The numerical availability of teachers and minders is a vital but not an adequate parameter for assessing the human resources availability of early childhood centers. This is because these personnel are expected to have some minimum level of professional training in early childhood education pedagogy at the National Certificate in Education (NCE) level. The researcher therefore examined the quality of these teachers and minders in terms of their professional qualification and training. A summary of that assessment is presented in Table 4.

From the table, it can be observed that public schools have very high number of qualified teachers with minimum of NCE (95.72%) with moderate numbers (50.83%) trained in early childhood pedagogy and very insignificant number with exposure to retraining in Montessori method. They however have very low number of qualified minders (20.42%), minders with training in early childhood pedagogy (13.61%), teachers exposed to training (5.22%) and none at all for minders.
The private schools on the other hand have moderate number of qualified teachers (65.73%) and low number of qualified minders. Personnel training in early childhood education in private school is (42.66%) and minders (23.11%). They have moderate number of teachers with exposure to Montessori retraining programme (67.31%) and for minders (56.44).

The findings of this study revealed that the staffing availability for the provision of early childhood education in public schools is adequate to meet the minimum standard specification with regard to teachers and minders (average of 82%), but virtually nil for doctors, nurses and guidance counselors. Although teachers are well qualified, most of them and virtually all the minders lack training in early childhood education. Private schools have moderately adequate teachers but inadequate minders to meet the minimum standard (average of 63%) but most of the teachers do not possess the minimum qualification of NCE, even though most of them are regularly exposed to retraining programme.

**HO:** There is no significant difference between public and private schools in the instructional resource availability for the provision of early childhood education in River State.

Table 5 shows that the T-value comparing mean instructional resources availability of public and private schools is -10.472, which is significant at 0.009. Since it is lower than the 0.05 alpha level at

<table>
<thead>
<tr>
<th>LGAs</th>
<th>No. of Schools</th>
<th>Existing Enrollment</th>
<th>Minder Availability</th>
<th>Satisfied Available Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Private</td>
<td>Public</td>
<td>Private</td>
</tr>
<tr>
<td>1. AbualOdual</td>
<td>14</td>
<td>3</td>
<td>1278</td>
<td>310</td>
</tr>
<tr>
<td>2. Degema</td>
<td>12</td>
<td>4</td>
<td>1438</td>
<td>352</td>
</tr>
<tr>
<td>3. Eleme</td>
<td>10</td>
<td>5</td>
<td>814</td>
<td>412</td>
</tr>
<tr>
<td>4. Emohua</td>
<td>7</td>
<td>3</td>
<td>633</td>
<td>278</td>
</tr>
<tr>
<td>5. Etche</td>
<td>16</td>
<td>6</td>
<td>1593</td>
<td>415</td>
</tr>
<tr>
<td>6. Ikwerre</td>
<td>15</td>
<td>5</td>
<td>1725</td>
<td>752</td>
</tr>
<tr>
<td>7. Kana</td>
<td>13</td>
<td>3</td>
<td>1067</td>
<td>432</td>
</tr>
<tr>
<td>8. Obio/Akpor</td>
<td>18</td>
<td>17</td>
<td>1125</td>
<td>2145</td>
</tr>
<tr>
<td>9. Ogba/Egbema/Ndoni</td>
<td>15</td>
<td>8</td>
<td>1048</td>
<td>684</td>
</tr>
<tr>
<td>10. Okrika</td>
<td>9</td>
<td>4</td>
<td>495</td>
<td>374</td>
</tr>
<tr>
<td>11. Oyigbo</td>
<td>10</td>
<td>7</td>
<td>876</td>
<td>1124</td>
</tr>
<tr>
<td>12. Port Harcourt</td>
<td>19</td>
<td>19</td>
<td>855</td>
<td>2414</td>
</tr>
<tr>
<td><strong>Aggregate (Mean)</strong></td>
<td>158</td>
<td>84</td>
<td>12947</td>
<td>9692</td>
</tr>
</tbody>
</table>

Table 3. Analysis of Minder Availability and Satisfied Capacity Rates for Early Childhood Education in Public and Private Schools
Table 4. Frequency and Percentage Distribution of Teachers and Minders by Professional Qualification and Training in Public and Private Early Childhood schools

<table>
<thead>
<tr>
<th>S/N</th>
<th>Personnel Quality Indices</th>
<th>Staff Category</th>
<th>Frequency</th>
<th>Public %</th>
<th>Private %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Personnel with at least NCE as qualification</td>
<td>Classroom teachers</td>
<td>403</td>
<td>95.72</td>
<td>65.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minders</td>
<td>108</td>
<td>20.42</td>
<td>18.67</td>
</tr>
<tr>
<td>2.</td>
<td>Personnel trained in early childhood Education/care</td>
<td>Classroom teachers</td>
<td>214</td>
<td>50.83</td>
<td>42.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minders</td>
<td>72</td>
<td>13.61</td>
<td>23.11</td>
</tr>
<tr>
<td>3.</td>
<td>Personnel exposed to regular Montessori retraining</td>
<td>Classroom teachers</td>
<td>22</td>
<td>5.22</td>
<td>67.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minders</td>
<td>-</td>
<td>0</td>
<td>56.44</td>
</tr>
</tbody>
</table>

Table 5. Mean, SD and T-Test of Difference between Public and Private Schools in the Instructional Resources Availability for the Provision of Early Childhood Education

<table>
<thead>
<tr>
<th>S/N</th>
<th>Categories</th>
<th>N</th>
<th>Mean</th>
<th>T-value</th>
<th>2-Tailed (Sig. Value)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Public schools</td>
<td>12</td>
<td>11.17</td>
<td>-10.472</td>
<td>.009</td>
<td>Significant</td>
</tr>
<tr>
<td>2.</td>
<td>Private schools</td>
<td>12</td>
<td>74.20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

which the hypothesis was tested, we conclude that the difference is significant. A look at the two means in Table 5 shows that the mean private school (74.20) is by far higher than those of public school (11.17). This means that private schools have significantly higher instructional resources availability than public schools. Therefore, the null hypothesis is rejected.

HO2: There is no significant difference between public and private schools in the human resources availability for the provision of early childhood education in River State.

Table 6. Mean and T-Test of Difference between Public and Private Schools in Human Resource Availability (Teaching Staff) for the Provision of Early Childhood Education

<table>
<thead>
<tr>
<th>S/N</th>
<th>Staffing availability indices</th>
<th>Mean Availability Performance</th>
<th>T Value</th>
<th>2-Tailed Sig. Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teachers satisfied capacity rates</td>
<td>82.62</td>
<td>3.135</td>
<td>.009</td>
<td>Sig.</td>
</tr>
<tr>
<td>2.</td>
<td>Minders satisfied capacity rate</td>
<td>113.07</td>
<td>13.784</td>
<td>.000</td>
<td>Sign.</td>
</tr>
<tr>
<td>3.</td>
<td>Teachers/minders quality index</td>
<td>31.00</td>
<td>-974</td>
<td>.375</td>
<td>Not sig.</td>
</tr>
</tbody>
</table>

As clearly shown in Table 6, the comparison of the first two staffing availability indices produced T-Values of 3.135 which are significant at .009 for teachers’ satisfied availability rate and 13.784 which are significant at .000 for minders’ satisfied availability rate. Since these two levels of significance are by far less than 0.05 alpha level. The researcher considered the differences as significant. The hypothesis is therefore rejected for these two variables. The comparison of personnel quality is therefore rejected for these two variables. The comparison of personnel quality index on the other hand yield no significant difference. This is because they obtained T-Value of -974 was found significant at 0.375, which is by far higher than 0.05 alpha level.

A comparison of the mean of teachers and minders available rate shows that those of public schools are higher than those of private schools. This means that public schools have significantly higher availability for teachers and minders than private schools.
3. Conclusion

From these results, it is very evident that both public and private schools do not have adequate instructional and staffing resources for early childhood education. Even though the availability of human resources in terms of teachers and minders may seem adequate, unfortunately, these personnel were neither trained nor conversant with early childhood pedagogy. As a result, the successful implementation of early childhood education will be a mirage considering that these vital resources are inadequate.

4. Recommendations

1. Now that government have shown interest on early childhood education, it is vital for government to make early childhood a comprehensive programme that should be collaborated with medical; paramedical, educationist, parents and members of the community and equip this level of education that is capital intensive in qualitative and quantitative dimension.

2. Government should mount centers for training and re-training of teachers for this level of education.

3. Government needs to review the minimum standards for early childhood education, which must receive input from educational planners, curriculum developers and other professionals of early childhood level of education. Besides defining the minimum standard, government must take the bold step by complying and enforcing these guidelines. This can be achieved by ensuring that all the public early childhood education centers are fully equipped with all the necessary instructional and qualified human resources that would give a sound educational foundation for the development of the Nigerian child. Such a practical standard should be the justifiable benchmark for monitoring and inspection of early childhood education centers. Detailed guidelines must be available to all proprietors of private schools and Head of Schools that house early childhood education centers.

4. Government should make it mandatory for all teacher training institutions to mount early childhood education programmes for training of teachers for this level of education and enforce regular inspection and supervision of these schools to ensure compliance with the minimum standard and quality delivery.

Finally, the diversified economic, social and political demand on education leave a country with no choice but to invest in building the whole structure of knowledge and skills. This can only be done by investing holistically in building the whole pyramid of knowledge and skills. With this approach, each level in the structure has its own importance and should not be traded for another.

5. References


Session 7: Learning / Teaching Methodologies and Assessment

An Experimental Analysis of Assessor Specific Bias in a Programming Assessment in Multi-Assessor Scenarios Utilizing an Eye Tracker
(Authors: Tanmoy Debnath, Manoranjan Paul, Subrata Chakraborty, Pallab Kanti Podder, Raj Gururajan, Abdul Hafeez-Baig)

The Use of a Specialised Learning Management System in an Introductory Programming Classroom
(Author: Trudie Benadé)

Challenges of Applying Blended Teaching in Learning: A Case of First Year Students at University of Botswana (UB)
(Authors: Queen Sello, Kelebogile N. Sebina)

"ZPD" An Approach to Develop Urdu Reading and Writing Skills among Students with Hearing Impairment
(Author: Humara Bano)
An Experimental Analysis of Assessor Specific Bias in a Programming Assessment in Multi-Assessor Scenarios Utilizing an Eye Tracker

Tanmoy Debnath, Manoranjan Paul, Subrata Chakraborty, Pallab Kanti Podder, Raj Gururajan, Abdul Hafeez-Baig
Charles Sturt University, University of Southern Queensland, Australia

Abstract

It has been experienced and reported by academic institutions around the globe that marking of most subject’s assessment scripts vary when different assessors are utilized for a given subject. To understand the difference, we capture and analyze cognitive response of assessors through the visual pattern while they are marking the scripts. For this, a Java programming assessment from a real life university examination is marked by independent assessors. The assessors marked the scanned assessment scripts on a computer screen in front of an Eye tracker machine and their eye gaze data were recorded real time. Data indicate that different assessors marked the same answer script differently and their visual pattern are also varied although they were given the exact same instructions which demonstrates bias to a degree. For quality marking, several findings including the number of assessors needed are also presented in this manuscript.

1. Introduction

In this study we intend to investigate the assessment bias in multiple assessor scenario by careful examination of the marking patterns in terms of given marks and visual pattern of individual assessor. Research studies that investigated the relationship between examiner background and marking performance suggested that various subjective norms influence marking behaviors [1]. These subjective norms differ between individuals, and differ at various junctures of marking conducted, within the same assessment. While background variables such as years of teaching experience, marking experience, experience with subject matter, and consistent behavior are assumed to play key roles in marking outcomes, objective investigation into these assumptions are required. This gave the impetus to this study.

The match between what is intended to be measured, and what is measured normally upholds the validity in assessment. While subjective judgement is an essential component for validity, this also introduces marker bias. The consequential validity, a type commonly known for nature and load of assessment upon teaching and student learning, while provides crucial information as a result of marking, doesn’t actually provide much needed ‘minimization’ of bias at the time of compiling end results of marking. In essence, using consequential validity doesn’t provide details of marker bias, but it can merely highlight issues in discrepancies [2].

In programming courses, due to the nature, marking criteria is normally a guide, and marker subjectivity is a key component in establishing the consistency. While the moderator or examiner can check the internal consistency of the marker, removal of assessor subjectivity is not that easy, thus necessarily introducing bias. The consistency of the marker is significant than whether he or she disagrees with the marker, in addition to marking criteria. Thus, in higher education assessments, a major threat to reliability is the lack of consistency of an individual marker (as a result of subjectivity), as well as between group of markers.

While multiple choice type tests, and formula based assessments (example mathematics problems and spread sheet calculations) improve reliability of assessment, in complex tasks such as programming assignments, it is not easy to arrive at high levels of reliability. While careful consideration of assessment criteria, marking scheme, moderation, and training can minimize the assessor bias, due to the time frame and cost, in modern tertiary settings, these don’t appear to be an optimal solution. Further, due to the changing nature of assessment tasks, and the cohort capabilities, setting up of the marking criteria, and providing training to minimize any potential marker bias is not that easy. In the current distance education model, and online assessment-marking trend, these tasks of training, moderation, ensuring internal consistence are becoming difficult to manage.

Agreement between assessors and within assessors has been used as two main measures of reliability in assessment marking [3]. Despite using marking rubric, there is plenty of evidence on the disagreement between assessors. When specific marking criteria scheme is used, the reliability is slightly improved, but the markers have limited freedom. This technique is not very well appreciated in assessments that are open and subject to critical
thinking types. When ‘content specificity’ is employed in assessments, student performance varies between contents, depending upon their knowledge in that domain, and this introduces bias at the time of marking.

The intrinsic validity and extrinsic validity also raise issues in terms of assessment marking bias. While course objectives could have been well described, its broader purpose may not be very clear. Similarly, while the assessment tasks are well defined, the very objective that the assignment is set to accomplish may not be clear. The assessment may not be appropriate for the course or program, and this can introduce varied views in terms of expectations, both from students and markers, leading to bias.

Eye tracking technique has been used successfully to distinguish between novice and expert programmers [4] [5]. The eye tracking is able to capture how a particular document was read, concentration level and concentration areas [6]. In this study we use the eye tracking technology to track the observation behaviour of markers while marking a programming assignment. The observation pattern will then be analysed to establish relationships with marker profile and the actual observation pattern will then be analysed to establish relationships with marker profile and the actual observation patterns will then be analysed to establish relationships with marker profile and the actual marks provided by the markers. A number of interesting observation are summaries for the quality and marking a programming assignment. The answer sheets were chosen based on marks provided by the original marker who did not participate in the eye tracker process.

Although the collected answer scripts belonged to both male and female students, all the markers were male aged 30 – 45 years. The first 5 markers (M1-M5) are the university programming markers and the remaining marker, M6 is the subject coordinator of the subject of that university. All of them have years to decades of programming, teaching, and marking experience in general and java course marking. The assessors’ were asked the following five questions in order to assess their academic circumstances:

Q1: How long have you been programming (in years)?
Q2: How long have you been programming in Java (in years)?
Q3: (In a scale of 10) How would you rate your own Java knowledge in the context of an undergraduate Java course?
Q4: How long have you been marking Java courses (in years)?
Q5: How long have you been involved in marking course scripts in general (in years)?

Their responses are presented in the Table 1.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>20</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Q2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Q3</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>N/A</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Q4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Q5</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>16</td>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>

Before the actual marking took place, the markers were briefed in detail about the experiments including the programming problem, and regarding the health and safety issues with the Eye Tracker (ET) that would be employed. The assessors were requested to break down the total score into various subcategories: Programming Logic: 3, Syntax: 2 and Program executability: 1 giving a total of 6 points to follow the university guidelines. Afterwards the 12 scripts were shown to the 6 markers on 6 different days on a computer screen at random and they scored the answer sheets.

While they were busy checking the examination scripts on the computer screen their eye gaze data was collected using a Tobii X120 ET [7] connected to the same computer for analysis later. As there were no prescribed time limits for marking, each examiner was free in taking as long as he wanted to check the scripts. Figure 1 shows the time in seconds each assessor required in evaluating the scripts.
2. Results and analysis

Figure 2(a-d) present the 6 assessors’ total and sub-category marks (inside the parenthesis) given to the 12 scripts. The original marks i.e. the marks that were given to the students during the real university examination were \(5, 3, 6, 2, 0, 6, 2, 5, 4, 0, 4, 3\) for 12 scripts. There were no subcategory marks provided within the original answer sheets. As the original marker had left the university by the time this research was undertaken, no ET information related to the marker could be obtained and thus markings is not included in this analysis. The numerical data and resulting graphs suggest that there are various levels of discrepancy in total and subcategory markings among the markers.

According to the markers’ profiles, M6 is the subject coordinator who has greater experience in Java programming. He is the lecturer of the subject. Hence in this manuscript the performance of others would be compared against him.

From the data, it is evident that total marking discrepancy is relevantly reduced for the highest (6/6, cases S6 and S9) and lowest (0/6, cases S5 and S10) values but variation tends to increase in the middle areas (1/6 ~ 5/6, cases: S1-S4, S7, and S8). This is expected since generally rational human beings could somewhat detect the best and the worst samples of a population with less effort. However, in the cases where middle range marks were to be awarded, the Java knowledge and experience influence the marking.

Tables’ 2-5 illustrate the percentage of absolute variation in total and subcategory marks from marker M6 to other markers. In total marking scenario i.e. in Table 2, markers M2 and M3 had 75% and 67% variations respectively only in one case each for highest and lowest marks. Other than that the variation is often low in such cases. Nevertheless in the middle marking ranges the variation is higher, an example of which is S7 that records a 350% variation for M4. Similar trends are observed in subcategory markings.

If the 3 subcategory markings (Tables 3-5) are compared it is observable that the markings variation is lowest when it comes to decide if a program would execute and highest in checking the logic level. This could be explained as like other computer languages, Java programs would be difficult to execute if there are errors in it. It is easier to identify an error than to check the logic of the entire program. Hence marking the logic subcategory thoroughly would be much more difficult than just locating one or more errors which would hinder the executability of the program.

Table 6 delineate the variation in marks between the total marks of M6 and average of all other markers. The last column of Table 6 demonstrates that on average all the markers (except M6) varied from 7% to 140% from the subject coordinator M6. In order to assess the performance of the markers, total differences (TD) between M6 and all markers’ marks for all 12 scripts were taken into account. Numerical calculations showed performance of the markers in the order: M5 > M1 > M4 > M2 > M3. The Table 7 presents the ranking (R).

### Table 2. Absolute variation in total marks against M6

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>10</td>
<td>60</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S2</td>
<td>0</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>S3</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S4</td>
<td>0</td>
<td>60</td>
<td>40</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S5</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>8</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>S6</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S7</td>
<td>0</td>
<td>50</td>
<td>200</td>
<td>350</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>S8</td>
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<td>71</td>
<td>43</td>
<td>14</td>
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</tr>
<tr>
<td>S9</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>17</td>
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<tr>
<td>S10</td>
<td>25</td>
<td>0</td>
<td>67</td>
<td>33</td>
<td>33</td>
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<td>50</td>
<td>100</td>
<td>33</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>S12</td>
<td>17</td>
<td>33</td>
<td>100</td>
<td>67</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 3. Absolute variation in logic marks against M6

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>50</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S2</td>
<td>100</td>
<td>200</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>S3</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>S4</td>
<td>50</td>
<td>100</td>
<td>0</td>
<td>25</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S6</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S7</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>83</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>S8</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>50</td>
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</tr>
<tr>
<td>S9</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>17</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S10</td>
<td>0</td>
<td>0</td>
<td>67</td>
<td>33</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S11</td>
<td>0</td>
<td>100</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S12</td>
<td>50</td>
<td>33</td>
<td>100</td>
<td>83</td>
<td>33</td>
<td>0</td>
</tr>
</tbody>
</table>
In the above sections numerical data analysis was presented. Here markers’ ET data would be characterized in terms of gaze plots and heat maps in order to gain deeper understanding of their cognitive processes such as attention, problem solving and decision making. ET data have been popularly utilized by academic researchers [8] [9] and businesses [10] around the globe to study human emotive responses.

Gaze plots are generated from raw ET data which show the participants’ eye scan pattern in various sized numbered circles in terms of eye location, order, and time spent on the answer scripts. Circle number 1, 2, 3, …, n represent the 1st, 2nd, 3rd and nth look on the scripts. The diameters of the circles are proportional to the length of the fixation duration, i.e. the time the participants have spent on a particular place which means that the longer the look, the larger the circle.

A heat map is a two dimensional color based graphical rendition of participants’ fixation information over the image test areas and the data entries consist of a timestamp, duration, and spatial location (X and Y co-ordinates). Here red usually indicates the highest number of fixations, followed by orange, yellow, and green in fixation level order. Heat maps could also be generated based on viewers’ other eye movement information such as absolute or relative fixation durations, proportion of participants who fixated on each area of the stimulus. It is suggested in [11] that should an analysis benefit from data visualization, a fixation count heat map ought to be presented. Hence in this work total number of fixations (i.e. count) have been used to analyze data. Count heat maps show the accumulated number of fixations where each fixation made by each participant adds a color value to the fixation map and the value is the same regardless of its duration.

Although gaze plots and heat maps were generated for all 12 scripts and 6 markers, only one representative scenario would be presented in this paper due to space limitations.

Figure 3 demonstrates the resulting gaze plots and heat maps for S1 only. The respective marks are also included at the bottom of each box. It is noticeable that while M6 has covered almost all the area of S1, M2 looked only at the middle and surrounding areas of the S1 and others in between according to the gaze plots. This evidence indicates that visual contour similarity with the bench marker i.e. subject coordinator is a good indicator to be quality marking. The heat maps provide information of the individual marker’s spending time in different areas. The heat map of the marker M2 is different compared to other marker including the subject coordinator. It is interesting to note that the area similarity in the heat maps are also positively correlated with the quality marking. This observation also exhibits more or less similar conclusions which conform another study [12].

Total time spending is another good indication of quality of marking. For example, M6 and M2 spent 173 seconds and 21 seconds respectively in checking S1. The fact that their marks varied by 60% demonstrates that the level of time spending is also a very important factor in this regard.
Table 4. Absolute variation in syntax marks against M6

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>25</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S2</td>
<td>0</td>
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</tr>
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</tr>
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<td>0</td>
<td>50</td>
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<td>0</td>
</tr>
<tr>
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<td>0</td>
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</tr>
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<td>0</td>
</tr>
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<td>0</td>
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<td>50</td>
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<td>0</td>
</tr>
<tr>
<td>S8</td>
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<td>100</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>S9</td>
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</tr>
<tr>
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<td>100</td>
<td>50</td>
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<td>0</td>
</tr>
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<td>0</td>
</tr>
<tr>
<td>S12</td>
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<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5. Absolute variation in executability marks against M6

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>25</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S3</td>
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<td>50</td>
<td>50</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S4</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S5</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S6</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S8</td>
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</tr>
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<td>50</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S10</td>
<td>150</td>
<td>0</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>S11</td>
<td>0</td>
<td>100</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S12</td>
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<td>0</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6. % Variation in average total marks against M6

<table>
<thead>
<tr>
<th></th>
<th>Average M1 to M5</th>
<th>M6</th>
<th>% Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>3.8</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>S2</td>
<td>5.4</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>S3</td>
<td>3.8</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>S4</td>
<td>0.5</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>S5</td>
<td>5.6</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>S6</td>
<td>2.4</td>
<td>1</td>
<td>140</td>
</tr>
<tr>
<td>S7</td>
<td>4.7</td>
<td>3.5</td>
<td>34</td>
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<tr>
<td>S8</td>
<td>4.9</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>S9</td>
<td>1.9</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>S10</td>
<td>3.3</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>S11</td>
<td>3.9</td>
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</tr>
<tr>
<td>S12</td>
<td>4.3</td>
<td>5</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 7. Markers’ ranking

<table>
<thead>
<tr>
<th></th>
<th>M6 - M1</th>
<th>M6 - M2</th>
<th>M6 - M3</th>
<th>M6 - M4</th>
<th>M6 - M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>0.5</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>1</td>
<td>0</td>
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<tr>
<td>S3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
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<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>S5</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>S6</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>S7</td>
<td>0.5</td>
<td>2</td>
<td>3.5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>S8</td>
<td>0</td>
<td>2.5</td>
<td>2.5</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>S9</td>
<td>0</td>
<td>4.5</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>S10</td>
<td>1.5</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>S11</td>
<td>0</td>
<td>1.5</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>S12</td>
<td>0.5</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>TD</td>
<td>7.5</td>
<td>19</td>
<td>21.5</td>
<td>15.5</td>
<td>6.5</td>
</tr>
<tr>
<td>R</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

2.1 Gaze plots and heat maps analysis

As demonstrated in Table 7, if marking performance is taken into account the assessors could be ranked in the order: M5 > M1 > M4 > M2 > M3.
3. Study on the role of scan time in finding context of this study.

4. and assessing the order becomes M4 &gt; M1 &gt; M2 &gt; M3 &gt; M5 if equal weight is considered for all 5 questions. Hence it could be stated that experienced assessor would not always produce the best quality marking.

2.2 Number of assessors for quality marking

In the most cases of the real scenario, university employed the most experience assessor to mark the assessments. In this section we try to verify whether employment of the most experience marker ensures the quality marking. We investigate the number of assessors that would provide sufficient quality marking in the given context based on the statistical data analysis. We use the variation of marks of different assessors against the marks given by the subject coordinator. To calculate the quality of marking we assume that we need to identify the number of assessors which would give the least differences in marking with the subject coordinator M6. Based on level of Java expertise, and how long assessors were acquainted with Java (as presented in Table 1) the assessors could be tallied in the following order: M4, M1, M2, M3, and M5 in terms of good marker assuming that when university employed an assessor based on the experience.

At first the average marks of the 5 assessors (M1 to M5) for all scripts were calculated and the standard deviation (SD) with their average marks (AVG) to the M6’s marks was calculated and all the SDs’ were summed up for all 12 scripts to tabulate the total SD. Then the statistical calculation was repeated for 4 assessors (M4, M1, M2, M3), 3 assessors (M4, M1, M2), 2 assessors (M4, M1) and 1 assessor (M4) cases. It was obtained that for 1, 2, 3, 4, and 5 assessors’ scenarios the total SDs’ were 11.0, 7.4, 8.2, 9.8, and 8.3 respectively which states that 2 assessors are better for quality marking in the context of this study.

3. Conclusions

Evidence of an association between assessor background and marking consistency indicates that the effects of assessor’s subject knowledge, teaching and marking experience on marking reliability are yet to be fully comprehended, and that discrepancies between grades are still a major issue. This study presents an experimental study into the biasness of marking in a multi-assessor scenario with the help of an eye tracker. The major findings of this manuscript are:

- Variation of marks are least for two extreme cases- best (6/6) and worst (0/6). Differences in marking increases in the middle scenarios (1/6 to 5/6)
- If assessors spend more time then the possibility of variation with the benchmark assessor is reduced.
- If the area of the visual contour (e.g. gaze data and heat maps) is similar to the benchmark assessor, the prospect of less variation is greatly enhanced.
- Marking performance is not always directly proportional to academic experience in terms of year.
- In our case study it was found that in terms of marking variation from the subject coordinator, 2 assessors are the best to produce quality marking.

As data suggests that various assessors’ marking deviated up to 350% from the subject coordinator, it would be interesting to know all the assessors’ respective explanations which could later be analysed. This study could be extended by incorporating examination papers from other disciplines (e.g. engineering, business etc.) and other academic institutions so that a national framework for examination marking could be proposed for a state or country. The assessors were all males. Hence this study may be gender biased. Additional work is in progress which mitigates the above mentioned issues.

4. References


The Use of a Specialised Learning Management System in an Introductory Programming Classroom

Trudie Benadé
North-West University, South Africa

Abstract

Educators are faced with the challenge of adapting their teaching styles to accommodate a new generation of learners. In this study a specialised learning management system, named SAM, as well as a flipped classroom was implemented to address this challenge. The success of such a change depends, to a significant extent, on student acceptance and use of this system. This quantitative study examined a group of students’ opinions about the new way of teaching after four months of use. This study draws upon the Unified Theory of Acceptance and Use of Technology as well as a framework of the determinants of learning effectiveness. A questionnaire was completed by 738 students. The results indicated that the students are comfortable with the use of SAM as well as the use of a flipped classroom approach.

2. Conceptual framework

2.1. Specialized learning management systems (SLMS)

A learning management system (LMS) is an information system that facilitates e-learning [3]. It is a software application for the administration, documentation, tracking, reporting and delivery of electronic educational technology (also called e-learning) courses or training programs. Specialized learning management systems (SLMS) have all of the characteristics of an LMS as well as the ability for automatic assessment. An SLMS can be used to provide online exercises for students as well as automatically assess and give immediate feedback on their submissions. Students can submit their assignments several times and use the feedback to improve on their answers. These systems generally record the results in a database, which allows the assignments to be used as part of the final grading. A central functionality of an SLMS is course management, because it enables the lecturer to structure the whole course around lecture schedules with deadlines for submissions. It also allows for the generation of summaries of results and monitoring of student progress. The use of SLMSs support the enhancement of Computer Science education [3]. Students are engaged while they observe, practice and train and then apply their skills in an application with immediate feedback.

In our module, Introduction to computers and programming with more than 900 students, we make use of an SLMS named Skills Assessment Manager (SAM). SAM is an interactive, online learning environment that helps students to master Microsoft Office and other computer concepts. Students use technology to observe live applications, then practice these applications and thereafter apply their skills in short questions. These are called “trainings” in SAM. Lecturers schedule projects that build on the trainings with deadlines for submissions. Students learn theory from live videos, they learn basic procedures that can be used in their projects and then finally apply the work learned through these trainings in the projects. SAM makes use of an auto-graded system to grade projects and has a reporting tool that gives immediate feedback with the opportunity to make corrections. The lecturer decides
when the project is scheduled and how many times a student may resubmit in order to correct mistakes and to improve their marks. SAM keeps record of everything done by the student (the trainings and projects) in a gradebook to use as part of the course marks. Pieterse [4] gathered success factors of automated assessment by analysing other researchers’ work. She observed several advantages of automated assessment; these include availability, consistency and objectivity of assessment as well as the fact that students can practise and get feedback at anytime and anywhere.

2.2. Flipped classroom

The availability of SAM made it possible to change the classroom culture in our module from traditional, to a more suitable flipped classroom also named an “inverted classroom” [5]. In a flipped classroom the events that traditionally took place inside the classroom, now happens outside the classroom and vice versa. This means that the students do the more passive activities involving reading notes and listening or viewing lectures outside the classroom, and the active engagement with the material (such as problem-solving) inside the classroom. Thus in the formal class time the students undertake collaborative interactive activities that are relevant to the learning material and therefore a collaborative learning environment is created where students can focus on working on projects with the guidance of their lecturers and support of their peers. Therefore in-class time is used for hands-on problem-solving, where both the lecturer and student assistants are available for support, and are not only used for formal lectures. In our case, we used SAM for the learning of procedures and theory outside the classroom. It was possible to schedule trainings on specific dates so that students have already worked through the information, notes and short practices before they had to do the projects during class time. This underlines some of the advantages of a flipped classroom approach: students came to class prepared and they could work through the learning material at their own pace and on their own time within scheduled dates. By using SAM as well as the flipped classroom approach, we adapted our teaching strategies to accommodate our students’ expectations.

In this study we aimed to perceive whether our students are at ease with the use of SAM as well as the flipped classroom approach that we followed and therefore to report on the use of SAM in a first-year programming module.

3. Theoretical framework

The acceptance of information technology yielded many models, each with different sets of determinants for acceptance. According to Venkatesh et al. [6] the research of user acceptance with regard to new technology has resulted in several models of which researchers had to choose constructs across the models or chose one that fitted their research best. They reviewed and compared eight prominent models and formulated a unified model, named the Unified Theory of Acceptance and Use of Technology (UTAUT). In this research we made use of the UTAUT as this model provides suitable foundations to determine the attitudes of our students towards the use of SAM in an introductory programming module. UTAUT was formulated with four core determinants of intentions and usage and four moderators of key relationships. The four determinants are performance expectancy, effort expectancy, social influence and facilitating conditions and attitude toward using technology, self-efficacy and anxiety are the four moderators that are not direct determinants of the intention to use technology. The determinants are discussed in the paragraphs below.

Performance expectancy is the degree to which an individual believes using the system will help them to better their performance [6] and therefore enhances the quality of their work. According to Davis et al. [7] people form intentions toward behaviours that they believe will increase their performance. Davis [8] asserted that beliefs influence attitudes, which lead to intentions and therefore generate behaviours. He asked the question “What causes people to accept or reject information technology?” Among other variables that may influence the intention to use a system he claimed that people incline to use an application if they believe that this will help them to perform better when using it. Secondly, they have to believe that it is not too difficult to use the system, so that the benefits of using the system will outweigh the effort of using the system.

Effort expectancy is defined as the degree of ease associated with the use of the system [6]. Davis [8] refers to this as perceived ease of use and claims that it pertains to the degree to which a person believes using a particular system would be free of effort. People will more likely use an application that is perceived easier to use than others and are more likely to be accepted by users.

Social influence is the degree to which an individual experiences how important people believe they should use the system [6]. In our case, the students had to use SAM in the module and didn’t have a choice not to use it. We therefore didn’t include this construct as part of our study.

Facilitating conditions are defined as “the degree to which an individual believes an organizational and technical infrastructure exists to support the use of the system” [6]. There should be guidance, assistance and instruction concerning the use of the system.
Intention to use is the dependent variable in this study. According to Hardgrave et al. [9] “Intention has become the de facto measure for gauging the acceptance of an innovation and has repeatedly proven to be a strong predictor of actual future use”.

To be able to comment on the potential value of the use of specific technology in our class, we used some of the dimensions of the framework of Piccoli et al. [10]. They developed a framework regarding the determinants of learning effectiveness in Virtual Learning Environments (VLE). Our classes are not the same as a typical VLE, but as mentioned above, we make use of a flipped classroom and an SLMS named SAM. VLEs share many similarities with SLMSs. For example, learners can access the material independently, individuals can follow different paths through it, it provides high levels of student control, supports interaction throughout the learning process, and provides an opportunity to restructure the learning experience [10]. There were some of the dimensions from the framework of Piccoli et al. [10] that was not suitable for our situation that has been omitted in this study. We included the construct “learner control” as well as “satisfaction” in our questionnaire to determine what the students’ impressions are. We focussed on the construct of learner control, because SAM made it possible to introduce the flipped classroom where students took responsibility for their own learning before attending class. Students could learn at their own pace and at a time that was convenient to them. Therefore they could control their learning experience as a whole. According to Piccoli et al. [10] higher degrees of learner control has an influence on the satisfaction of the learning experience and therefore also on the effectiveness of the use of a VLE.

4. Research methodology

In this section the demographics of the participants will be showed and then the research design, data collection and analysis are discussed.

4.1. Research design and participants

A quantitative study was conducted on the students enrolled for the module “Introduction to computers and programming” at the Potchefstroom campus of the North-West University in South Africa. There were 978 students enrolled for the module of which 738 completed the questionnaire which indicates a response rate of 75.5%.

Table 1 gives information regarding the profile of the respondents.

### Table 1. Profile of respondents (n=738)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of students</td>
<td>492 (66.7%)</td>
<td>246 (33.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IT as school subject</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of students</td>
<td>132 (17.9%)</td>
<td>7387 (82.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access to a computer since Grade 1</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of students</td>
<td>307 (41.6%)</td>
<td>431 (58.4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wireless Internet (WiFi) access at home</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of students</td>
<td>397 (53.8%)</td>
<td>341 (46.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Own or have access to: Desktop, computer, Laptop, Minicomputer, Tablet</th>
<th>Not one</th>
<th>One of them</th>
<th>Two of them</th>
<th>Three of them</th>
<th>Four of them</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%) of students</td>
<td>42 (5.7%)</td>
<td>104 (14.1%)</td>
<td>273 (37.0%)</td>
<td>276 (37.4%)</td>
<td>43 (5.8%)</td>
</tr>
</tbody>
</table>

4.2. Data collection and instrument

The study was conducted after 4 months of using the interactive online learning environment, SAM, and the flipped classroom. A questionnaire that was based on UTAUT was developed by the researchers, using only relevant questions for this study and also changing certain words to fit the specific circumstances. UTAUT was formulated with four core determinants of intentions and usage and four moderators of key relationships. The four constructs are performance expectancy, effort expectancy, social influence and facilitating conditions and attitudes toward using technology, self-efficacy and anxiety are the four moderators that are not direct determinants of the intention to use technology. The dimension of social influence was omitted from this study. Questions regarding the effectiveness of VLEs from the framework of Piccoli et al. [10] were also incorporated into the questionnaire.

The questionnaire consisted of 3 sections: a section for the demographic information, 40 questions accompanied by a Likert response scale with 5 possible answers to choose from and three open response questions. These three questions were not taken into account for this paper. The questionnaires were distributed via Google forms and consisted of closed as well as open questions.

4.3 Data analysis

The responses were examined using nine factors (see Table 2 for the factors). A Cronbach alpha (α) was calculated for each of these factors.

It was found that eight of the nine factors were reliable with α ≥ 0.6. The factor Satisfaction measured a value of 0.34 and with closer inspection we found that two of the questions could be deleted from the group as they were duplicates and it could
be that they were not well understood by the students. After deletion of the two questions the factor measured a Cronbach alpha of 0.775. Table 2 shows the factors with each factor’s reliability coefficient.

Table 2. Factors (with reliability coefficients)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cronbach’s alpha (α)</th>
</tr>
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<tbody>
<tr>
<td>Performance expectancy</td>
<td>0.901</td>
</tr>
<tr>
<td>Attitude towards using technology</td>
<td>0.896</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>0.872</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.791</td>
</tr>
<tr>
<td>Learner control</td>
<td>0.786</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>0.775</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>0.759</td>
</tr>
<tr>
<td>Behavioural intention to use the system</td>
<td>0.683</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.679</td>
</tr>
</tbody>
</table>

5. Results

Table 3 shows that the students are positive to use SAM. They found it easy to use as can be seen from the high mean for the factor effort expectancy. The low mean for anxiety indicates that the students do not feel anxious when using SAM. Their attitude towards technology is ranking high.

Table 3. Descriptive Statistics (n=738)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance expectancy</td>
<td>3.898</td>
<td>0.716</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>4.089</td>
<td>0.651</td>
</tr>
<tr>
<td>Attitude towards using technology</td>
<td>3.827</td>
<td>0.788</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>3.776</td>
<td>0.655</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.939</td>
<td>0.607</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.447</td>
<td>0.831</td>
</tr>
<tr>
<td>Behavioural intention to use SAM</td>
<td>3.785</td>
<td>0.843</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3.466</td>
<td>0.846</td>
</tr>
<tr>
<td>Learner control</td>
<td>4.111</td>
<td>0.622</td>
</tr>
</tbody>
</table>

The high mean for the factor of learner control indicates that students enjoyed using SAM and learning at their own pace as well as the fact that they could complete the trainings at any computer and at any time – not necessarily in class time. The factor of satisfaction measured the students’ opinion regarding the shift of responsibility from the lecturer to the student. The mean of 3.466 indicated that they could adhere to the new way of teaching/learning and they didn’t find it too complicated. Using SAM enabled the students to be self-efficient as they could complete tasks on their own even when there was no one around to help them. The mean of 3.939 of the factor self-efficacy is high.

In order to investigate the students’ attitudes regarding normal lectures versus trainings in SAM, we included the statement “I would rather have normal lectures instead of training through SAM in this course” in the questionnaire. Table 4 shows the results of this question.

Table 4. Frequency table

<table>
<thead>
<tr>
<th>I would rather have normal lectures instead of training in SAM in this course</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>89</td>
<td>12.1%</td>
</tr>
<tr>
<td>Disagree</td>
<td>201</td>
<td>27.2%</td>
</tr>
<tr>
<td>Neutral</td>
<td>271</td>
<td>36.7%</td>
</tr>
<tr>
<td>Agree</td>
<td>117</td>
<td>15.9%</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>60</td>
<td>8.1%</td>
</tr>
</tbody>
</table>

This indicates that only 24% of the students prefer normal lectures above the use of SAM.

Table 5. Correlation with behavioural intention to use SAM

<table>
<thead>
<tr>
<th>Factors</th>
<th>Correlation coefficient</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance expectancy</td>
<td>0.777**</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>0.765**</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Attitude towards using technology</td>
<td>0.748**</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>0.616**</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>0.528*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Learner control</td>
<td>0.506*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.434*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-0.231</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* Medium practical significant relationship
** Large practical significant relationship

* Likert-style responses were ranked from 1 to 5 respectively
Table 5 shows the results of a Spearman’s rho correlation analysis to examine the correlation between behavioural intention and the other factors. There is a large practically significant relationship between the students’ intention to use SAM and the factors performance expectancy, satisfaction, attitude towards using SAM and facilitating conditions. Therefore the students’ positive feelings regarding the use of SAM correlated with their intention to use SAM.

6. Conclusion

In this paper the use of an SLMS named SAM as well as a flipped classroom approach were investigated in a first year introductory programming course. With the use of a questionnaire, based on the Unified Theory of Acceptance and Use of Technology (UTAUT) I can conclude that most of the students in the study are positive about using SAM and that most of the students prefer SAM above normal lectures. Further, they were comfortable with the shift of responsibility from the instructor to the student concerning the studying of the content.

The real benefit of SAM for our on-campus, undergraduate students may in fact come from blending desirable features of a VLE with personal contact benefits of the traditional teaching/learning environment.

7. References

Challenges of Applying Blended Teaching in Learning:  
A Case of First Year Students at University of Botswana (UB)

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Abstract

This study aims to investigating the challenges that first year student’s experience when using blended learning at UB. Most of the first year students at UB are not that computer literate because they had very minimal or no exposure to using computers at basic education level where computer related subjects such as computer studies and information technology [IT] are offered as electives at senior secondary school and only. Hence only few students opt to do these IT courses. More so at basic education level most of the schools do not incorporate use of IT and ICT related tools such as using the computer as part of the teaching and learning aids in day to day classroom teaching and learning. At this level teaching approaches are still very much traditional. However at university level computers are used as part of the teaching and learning tools and learner management systems (LMS) such as Blackboard and Moodle are also used as teaching and learning platforms hence, blended learning is part of many of the courses that these students take. Consequently, this gap of computer literacy between basic education and university poses many challenges to students when using blended learning.

The research method used is the quantitative research method. Research tools used include a questionnaire that was administered to 150 students enrolled in both ICT 121 and COM 141 courses during the first semester of 2015/2016 academic year. In addition, interviews and classroom observations over the same period were conducted by the researchers. The study is guided by the Diffusion of Innovation theory theoretical framework Rogers (2003). In this theoretical framework Rogers’s theory seeks to explain how, why, and at what rate new ideas and technology spread. Thus the research found it to be an appropriate theoretical frame to base their study on since their study is on challenges that learners have when introduced new ideas and technology and it seeks to understand why students have these challenges and how solutions to these challenges can be established.

A study conducted by Masalela (2009) indicated that there some potential benefits for blended learning that included improved pedagogy; engagement in learning; and added flexibility in teaching and learning. This study further showed that there were perceived complexities such as lack of students' readiness to use the course management system, slow network and breakdowns; lack of computers for students and lack of time. Another study by Thomas (2008 on blended learning as a component of eLearning at UB showed that there was a slight (but not ignorable) declining trend in the technology diffusion process from the first semester of the 2005/06 academic year. Thomas argues that this trend is seen in both the number of active online courses as well as the number of online course designers. He further states that based on several technology adoption models and theories (Roger's diffusion theory, Hall & Hord's Concerns Based Adoption Model, Moore's hypothesis for the possibility of a chasm, Gartner's hype cycle, Burkman's User Oriented Instructional Development (UOID) process, Stockdill & Morehouse' checklist of critical factors that facilitate adoption of innovations in educational settings including Uys’ LASO model that guides the implementation of technology at UB and the outcome of personal interviews with three EduTech members and
ten lecturers who are currently using eLearning in conjunction with face-to-face approaches, students at UB find it difficult to use blended learning.

The discussions of the study will conclude by suggesting future directions for blended learning based on the literature review and findings of the study.
“ZPD” An Approach to Develop Urdu Reading and Writing Skills among Students with Hearing Impairment

Humara Bano

University of the Punjab, Lahore

Abstract

Poor reading and writing abilities of children with deafness add on the effect of hearing loss to the extent that they are not able to communicate even for their basic needs such as food, shelter, and health etc. This phenomenon is very unique in this part of world as children with hearing loss living in other countries do not experience such handicap. Children with hearing impairment face difficulty in acquiring reading and writing skills not because of their inherent shortcoming but only because of outdated methods of teaching based on a particular ideology (frozen beliefs) about teaching and learning processes of these children. Such ideology does not allow any change in existing conditions as both teachers and students do not know their real interest. Children with hearing impairment use signs as their first language. But unfortunately sign language is discouraged by the teachers. This clash of interest creates a barrier between teachers and learners. A lack of communication leads to poor cognitive development. As a result the students with hearing impairment are not able to master the basic Urdu vocabulary to develop reading comprehension and written expressions. Moreover, students with hearing impairment face tremendous difficulties in their communication with other people when they join the world of work after schooling. This study was conducted to i) investigate the effectiveness of video clipping in teaching Urdu reading and writing to students with hearing impairment by using ZPD approach. For this pretest-posttest control group design was applied to conduct the study. An Urdu Reading and Writing test was used to compare the pre-post test results of the students with hearing impairment after getting the treatment through video clips. Results revealed that there was a significant gain in reading and writing abilities of students with hearing impairment by following ZPD approach.
Session 8: Global Issues In Education and Research

Cultivating an Atmosphere of 21st Century Collaboration: A Pedagogical Approach
(Author: Joshua Miller)

Evaluating the Effectiveness of the Preparation for Academic Studies Received in Public Schools vs. Private Schools
(Authors: Noy Snir, Michal Daloya, Avner Halevy)

Global Issues and Barriers to Learning: Deconstructing Unconscious Assumptions of Poverty and Mental Health in Secondary School Education
(Author: Darlene Ciuffetelli Parker)

Differential Susceptibility to Environmental Influences: Who is Affected by What Media Content under Which Circumstances
(Author: Deborah Nichols Linebarger)
Cultivating an Atmosphere of 21st Century Collaboration: A Pedagogical Approach

Joshua Miller
University of Wisconsin La Crosse, United States

Abstract

21st century learners challenge the traditional instructional process as they seek opportunities that facilitate a greater emphasis on communication, collaboration, and cooperation. Further, as preexisting boundaries are being circumnavigated through globalization, preparing future educators to engage with peers from local, national, and international levels is becoming a necessity. Through a conceptual analysis of a pedagogical perspective that considers the call for greater collaboration, this work in progress seeks to explore avenues to extend student cooperation, with an emphasis on global connectedness. As this paper sets the stage for outlining the benefits of establishing effective partnerships for teacher candidates, with the implications of fostering culturally and globally responsive educators, it is also positioned as a starting point for future educational research and scholarship.

1. Introduction

According to Barkely, Cross, & Howell-Major [2] collaborative learning involves the concept that knowledge is a socially constructed phenomenon where the student or students drive the endeavor through personal relevance and a structured approach to addressing real-world problems. The advantages of this approach, within the field of teacher preparation, include the development of self-authorship, an increased exposure to diverse perspectives, and both personal and professional experience working with expanding partnerships. Additionally, Kumaravadivelu [7] advances the role of 21st century educators to include the descriptors of “mediators and negotiators” (p. 317) as teachers work through the educational milieu rooted in a global perspective. With a nod to 21st century technologies, and an appreciation that the world is rapidly shrinking, a significant aspect of teacher preparation programs includes the broadening and deepening the cultural literacies of future educators.

2. Current initiatives UWL DES

Currently within the Department of Educational Studies at the University of Wisconsin-La Crosse, I am striving to build collaborative opportunities for education majors to immerse themselves in projects that will allow them to see beyond the literature, and experience the globalized world for themselves. These collaborative relationships are better defined as partnerships, as I hope to cultivate an exchange of mutually beneficial ideas and resources, which align with Zhao’s [10] perspective that such endeavors must be sustainable. From a local standpoint, my first and second year students will spend 20 hours per semester in the neighborhoods of our local community, La Crosse, to better understand the social determinants of education. They will accomplish this by gaining a first hand perspective into the daily lives of the families they will serve as educators. In a future collaboration with the County Health and Human Services Department, students will spend time embedded within the community side-by-side with case-workers, family medical residents associated with Gundersen Health, and youth services experts such as the YMCA to enrich individual appreciation for the diversity of families and students within the local community.

On a national level, I am seeking to connect my students with virtual collaborative opportunities between education majors enrolled at various institutions, such as my former school of Ball State University. It is my hope that students will share experiences related to our local collaboration efforts in an attempt to develop strength-based lessons for meeting the diverse needs of all students (local and national). All of my education majors routinely form professional learning community (PLC) teams within each course, as described by DuFour, Eaker, and Karhanek [5]. Ideally, these teacher candidates would connect with teacher candidates from other institutions, such as Ball State University, as a means
of synthesizing ideas from across diverse perspectives. These collaborations would then yield multimodal curriculum projects that address the social determinants of education through innovative lesson planning and service learning projects.

Internationally, students enrolled in my course Education within a Global Society, will have the opportunity to collaborate with students and scholars from across the globe including educators from the La Crosse sister city of Louyang, China. Having dedicated two weeks to traveling throughout China in September 2016 with the Provost and the Dean of the School of Education, I have successfully identified and secured partnerships with multiple primary, secondary, and post secondary institutions of learning. Our aggressive academically based travels have yielded a recently approved faculty-led-study-abroad program, where a colleague and I will escort 15 to 20 UWL education majors to China during the summer of 2017. During this study program, students will work alongside teachers, students, and scholars from across China on such topics as curriculum, pedagogy, and scholarship.

Additionally, it is my hope to have UWL education majors working with institutions of higher learning throughout the continent of Africa such as The University of the Free State in South Africa. I desire to have my students work with peers who are dedicating their lives to wrestle with the concepts of equity and equality, specifically with programs like the Institute for Social Justice and Reconciliation. These new partnerships, which according to Zhao [10] are more robust than one-time collaborations, will yield opportunities for immersive learning projects that explore the elements of developing globally responsive educators with increased cultural intelligence and competencies as indicated by Ang and Dyne [1].

By offering UWL students the opportunity to experience the globalization of teaching in a globalized world where professionalism elevates the would-be candidates. Kumaravadivelu [7] demonstrates the innate need to have educators, both current and future, possess the capacity to evolve and meet the challenge of teaching in a globalized world. It is in this new world where professionalism elevates the would-be

### 3. Body of knowledge

According to Lankshear & Knobel [8], 21st century learners crave a more active voice in the educational process, as they aggressively seek ways to enrich their individual learning experience. We now live within an ever-increasing globalized community, where it behooves educators, K-16, to cultivate an atmosphere of collaboration that moves beyond the classroom and into a world where preexisting barriers no longer apply [10]. Cultivating local, national, and international partnerships connect with Barkely et al. [2] when they advocate for the need of professional learning communities to address barriers of student success. These newly established learning communities could be organized through 21st century technologies combined with the individual autonomy to pursue them more fully. Kant, as cited by Buchner [4], is a champion of developing autonomy and discusses the aim of authentic education as a means for this development by the awakening of students to “ripe individual thinking” (p. 24). The 21st century is the right time to yoke the authenticity advocated by Kant with modern technologies and establish a global connectedness between educational students, scholars, and communities.

These new approaches also foster individual self-authorship as espoused by Raz [9] and entice a more globally responsive perspective that can lead to meaningful pedagogical practices. Arguably, these new technologies have transformed the way society functions placing education as the ultimate prize and leaving those unable to engage at a distinct disadvantage. The symbiotic relationship between technology integration and society is obvious, as one can no longer exist without the other. Truly, our modern society is both informed by and informs the advancement and use of technology. Lankshear and Knobel [8] advance the idea that “If we are to learn deeply, we need access to the means, contexts, and tasks” (p. 212) that are innate to the very creation of knowledge. It is Jonassen, Carr, and Yueh [6] who insist that educational technology provides that access by offering learners a near limitless potential in the form of “knowledge construction tools” (p. 24), which emphasize the capacity to organize, synthesize, and demonstrate learning.

Finally, it is through these 21st century technologies that I will be afforded the opportunity to more fully develop local, national, and international partnerships that will in turn inform the praxis of my UWL teacher candidates. Kumaravadivelu [7] demonstrates the innate need to have educators, both current and future, possess the capacity to evolve and meet the challenge of teaching in a globalized world. It is in this new world where professionalism elevates the would-be
teacher to embrace both content knowledge as well as the capacity to culturally respond to the needs of students of the global society.

3.1 Partnerships, autonomy, technology

Since the Age of Enlightenment, individuals have endeavored to understand their position in the world in which he or she lives. The understanding of that reality is founded upon the experiences associated with held beliefs, values, and actions, as well as the motivations and freedoms behind those actions. Such considerations can be evaluated by the conscious act of reflecting upon those experiences and then using that interpretation as a guide for choosing an action, as individuals create their own reality through choice.

For those of us in the US, the freedom to choose is a deeply held individual conviction that can inadvertently hinder one’s ability to view other educational perspectives appropriately. For example, working within small self-assignment collaborative groups is commonplace throughout the American K-16 system of learning, and remains a growing phenomenon throughout the world of education. My students often view its absence as undesirable, as they question the lack of individual choice when studying systems of education where the needs of the individual is not as significant as are the needs of the collective. Such considerations are necessary for becoming a globally responsive educator who willfully, autonomously, seeks to wrestle with the social forces that influence teaching and learning.

Raz [9] espoused the advantages of autonomy as a means for citizens to cope with evolving technologies and the fluidity associated with both “economic and social conditions” (p. 370) of the modern age. As future teachers, my UWL students must continue to move beyond simply becoming content experts and instead look to invigorate the autonomous self who is able to grow and develop based upon the economic and social needs of their students. In this regard, we can attach Bruner’s [3] position in his appreciation of the idea involving self-authorship. He ponders the purpose of education in terms of enabling “individual human beings to operate at their fullest potential” (p. 67), through the equipment of both skills and the understanding of how best to apply those skills.

In this sense, the pedagogical praxis of my students will be influenced by their collaborative experiences, which will further embolden them to reflect and exercise individual self-efficacy. Fostering global partnerships, based upon the autonomous self to choose how and when to engage, will ultimately provide the flexibility of the individual to adapt and circumvent challenging situations that could otherwise preclude future students from active participation.

Advancing the understanding that we now live within a global community holds unique implications for future educators. These implications must guide our practice in preparing students to view the world as truly through a globalized perspective [10] where previous barriers have been removed. In this modern age, it is now essential for individuals to learn to adapt to alternating situations as society has become enveloped with change, as we continue to experience the passing of the industrial society and the dawning of the knowledge and relational age. The transformation of the global economy has rapidly increased, revealing a need to prepare individuals who can successfully and collaboratively engage within an evolving society [8].

4. Conclusion

Raz [9] contends that self-direction and the ability to exercise “authorship” (p. 370) over one’s life is an indispensable aspect to his or her well-being. I contend that the educator, who has exercised a similar level of self-direction, would likewise experience a comparable sense of professional well-being. If we know that the autonomous person will lead a more robust life, as offered by Immanuel Kant [4], then I believe that the same holds true for future educators. Further, if that sense of autonomy can be affected through the development and participation within sustainable international education partnerships, I believe that this speaks to a pedagogical approach in need of further exploration.

I view this line of thinking as a means of pursuing meaningful opportunities for 21st century collaboration that yokes the essential need for future educators to view teaching and learning from a global perspective. As educators, we must foster the capacity within our students to reach beyond traditional modes of teaching through intentionally seeking and developing lasting partnerships from local, national, and international communities.

This work in-progress is a starting point upon which I hope to build a future of educational research, scholarship, and international collaborative projects that move our thinking to embrace a global perspective that benefits both the individual as well as the ever shrinking world community. This global perspective will be informed through the cultivation of local and national partnerships that allow my students to develop and exercise the freedom and autonomy to collaborate more fully upon the international level.

Through my participation at the London International Conference on Education, I will be presented with the opportunity to share my ideas, invite critical friends to offer feedback, and identify potential future partnerships from across the globe.
Cultivating globally responsive educators is a global responsibility in itself, and one that requires a pedagogical approach that supports sustainable partnerships. We must resist the ubiquitous compartmentalization and sedentary thinking that pervades our individual systems of education. Instead, let us collaboratively foster the authenticity and creativity of students within teacher preparation programs to embark upon the exploration of the field of education through a pedagogical perspective with a focus on the global community. Let us form partnerships where students from across the world embrace global professional learning communities as they lead our singular community to a brighter educational future.

This understanding is significant in light of this ongoing work, which seeks to better understand the benefits of working collaboratively with educational students and scholars from a perspective that values the benefits and consequences of globalization. Future educators must be equipped to engage the world in which they live, whether through technologies or not, and possess the freedom and self-direction to drive the collaborative learning experience.

5. References


Evaluating the Effectiveness of the Preparation for Academic Studies Received in Public Schools vs. Private Schools

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Abstract

This research examines the effectiveness of instilling 21st century skills in graduates of public versus private schools. The five skills that were examined are information literacy, critical thinking, interpersonal communication, self-regulated learning and the use of information and technology (ICT). No difference was found between graduates of public and private schools regarding their command of the five skills. Nevertheless, among women, graduates of private schools were found to have a large advantage over female graduates of public schools regarding their use of ICT. It was also seen that women have better control over self-regulated learning than men do. Conversely, they have less control over the skills of information literacy, critical thinking, interpersonal relations and use of ICT. Educators must recognize these 21st skills and the variables that affect command of them, in order to plan effective quality policies for education, which will take into consideration the gaps between different student populations.

1. Introduction

The Israeli educational system is leaned on a strong public base. Nevertheless, for about thirty years a privatization trend has existed, and the input of parents, associations and business entities in this development is increasing and strengthening. In Israel, the private educational system is different than that existing in other countries. Hundreds of unique schools, set up by parental associations and educational networks, are defined as “recognized non-formal schools” (private) and are given budgets by the government that are 60-90% of those allocated to formal schools (public) [1]. The question, accordingly, is whether the type of school determines its quality.

2. The Israeli educational system

The Israeli educational system can be viewed according to four main cross-sections. 1) by age:

- Early childhood education – ages 3-5; primary school education – grades 1-6 (ages 6-11) or grades 1-8 (ages 6-13); post-primary education – middle school: grades 7-9 – ages 12-14 and high school: grades 10-12 – ages 15-17; post high school and academic studies – ages 18 and above. 2) by legal status: formal education – state and state-religious educational institutions owned by the state or by local authorities; recognized but not formal education – institutions that are not owned by the government but that have agreed, to a higher or lower extent, to be supervised and budgeted by the state to a degree less than that given to formal educational institutions; exempt institutions – ultra-orthodox educational institutions that the educational system recognizes as institutions exempt from having to fulfil the general requirements of the educational system, and for which special conditions exempting them from fulfilling the core curriculum law have been instituted. 3) by type of supervision: State – institutions that are not religious in the Jewish and non-Jewish sectors. State education and state-religious provided by the state is independently of any political, ethnic etc. body and is overseen by the Minister of Education; state-religious education – Jewish, religious-Zionist educational institutions. This is state education whose institutions are religious in lifestyle, curriculum, teachers and superintendents; “other” supervision – Jewish-ultra-orthodox educational institutions. 4) By sector: Jewish; non-Jewish – Arab, Beduine, Druze, Circassian [2].

3. The skills required by high school graduates in the 21st century

The role of schools is to prepare the young generation for the future. Dr. Uzi Melamed and Ami Salant (2010) [3] conducted a global review of researchers’ and educators’ opinions regarding the question of the skills schools should provide adolescents in the 21st century. They found nine skills, with five being present in the majority of sources they reviewed: information literacy skills, critical thinking skills, interpersonal communication skills, self-regulated learning skills and use of...
information and communications technology tools skills.

4. Research rationale and hypotheses

Dronkers and Robert (2008) [4] analyzed the differences between educational achievements in public and private schools in 22 countries. The researchers evaluated the impact of various factors while controlling for differences in sociological characteristics of the students and their parents, the schools’ population, learning conditions in the schools and the perceptions of students and headmasters regarding the climate of their schools. The main explanation found for the differences in educational achievements was the better social composition in the private schools. These differences in educational achievements among students in the public and private sectors are identical among different nations, despite the differences in the various educational systems’ pasts.

The central research question examined the command of 21st century skills by public and private school graduates, owing to their school studies.

4.1. The moderating variables in the model

Zheng, Sauder, Shelley and Whalen (2002) [5] investigated the link between grades in the first year of college and previous background characteristics: high school grades and ACT grades (equivalent to the Psychometric Test in Israel), gender, ethnicity, parents’ education and parental status (married or separated/divorced).

Whereas the high school and ACT grades were found to be significant predictors of academic success, explaining about 25% of the variance in the average grades in college, the remaining variables together—gender, ethnicity, parents’ education and marital status—were found to explain only 6.2% of the variance in the grades.

In light of these findings, in the present model, we refer to the following factors—average grade on the matriculation exams, Psychometric Test score, gender, parents’ education and marital status—as the moderating variables when comparing the type of high school in which the student studied and their command of 21st century skills.

5. Method

5.1. Participants

The study participants were undergraduate university and college students. They were selected under the assumption that as students now, and high school graduates in the not too distant past, they would utilize the skills acquired in their high school studies and as such, be able to assess their command of these skills.

All 317 participants graduated from Jewish state schools in Israel. Of these, 239 graduated from public schools (75%) and 78 graduated from private schools (25%). This representation was found to be fairly close to the general population proportions (80% vs. 20%, respectively).

Of the participants, 200 were women and 111 men (6 participants did not answer the question about gender) and the range of ages was 19-34 (mean = 25.82, SD = 2.31).

5.2. Instruments

The study data were collected using a questionnaire, constructed and based on items taken from validated questionnaires published in the scientific literature. The questionnaire comprised five parts. The first part included questions about their backgrounds. In the second part, participants were asked to rate their level of ability to carry out each one of the actions listed on a Likert scale (in this part, items that measured control of information literacy skills appeared). In the third part, participants were asked to rate their degree of agreement on a Likert scale with each item listed (in this section, items that measured command of critical thinking skills, interpersonal communication and self-regulated learning appeared). In the fourth part, participants were asked to rate on a Likert scale their frequency of carrying out each of the actions listed (in this section, items that measured command of the use of ITC skills appeared). The fifth part of the questionnaire asked for additional demographic details.

6. Findings

We did not find that the students, graduates of private high schools, had better command of the five 21st century skills than the graduates of the public schools.

The hypothesis that the type of school, Psychometric Test score and the interaction between them affects each of the 21st century skills was examined using linear regression. Interaction between type of school and Psychometric Test score was found in the command of students of the information literacy skill. Among students whose score on the Psychometric Test was 600 and below, students who graduated from private schools, had an advantage in their command of the information literacy skill. For students who had a score of 600 or higher on the Psychometric Test, no similar significant advantage was identified.

The hypothesis that type of school, gender and the interaction between them influence each of the
five 21st century skills was examined using analysis of variance (ANOVA).

It was found that among females, graduates of private schools vs. graduates of public schools have an advantage in their command of the information literacy skill, whereas among males, no similar significant advantage appears.

It was also found that among men, there is a greater advantage for graduates of private schools in comparison to graduates of public schools regarding command of the critical thinking skill than among women. Similarly, in general, we see that men have better command of critical thinking skills than women - independent of the type of school in which they studied.

In addition, it was found that males have better command than women of interpersonal communication skills, independent of the type of school from which they graduated.

Likewise, in general, it appears that men have better command of use of the ICT skills than women, regardless of the school in which they studied.

It was hypothesized that type of school, father’s education, mother’s education and the interaction among them influence each of the five 21st century skills: information literacy, critical thinking, interpersonal communication, self-regulated learning and use of ICT.

Among students whose fathers had a high school or lower education, it was found that graduates of private schools had an advantage in information literacy skills compared to students whose fathers had a graduate degree or higher. Among the latter, the graduates of public schools had an advantage in command of the same skill.

7. Conclusion

7.1. Summary and possible explanations for the research’s main findings

The research findings did not support the main hypotheses—that we would find a difference between graduates of private schools and graduates of public schools regarding their command of each of the five 21st century skills.

It was found that women’s command of interpersonal communication was not as good as that of men. The explanation for this finding can be found in the research conduction by Lakoff (1990) [6], who asserted that “the spoken language of males is characterized by unambiguous expressions that articulate strong feelings, positions that are unequivocal, confidence, and conversation topics that are perceived as important in social terms”. Moreover, “the spoken language of females is characterized by a lack of decisiveness, avoidance of expressions that reflect strong emotions or the taking of cautious positions that reflect a lack of self-confidence and topics of conversation that are regarded as trivial and unimportant in social terms.”

Given that the questionnaire items that investigated the command of interpersonal communication skills focused primarily on participation in discussions and social discourse, men have an advantage in this type of communication, according to the attributes of men’s spoken language, compared to women.

The study also found that, in general, men have better control of the use of ICT than women do. This better command of men can be explained by data from the Israel Central Bureau of Statistics for the year 2013 [7]. It was found that there are fields of study for which demand is gender biased. Study areas in which the percentage of women is relatively high are the paramedical professions, humanities and social sciences, whereas in engineering, architecture, exact sciences, statistics and computer sciences study areas their percentage is low.

In the present study, it was found that among men, 51% are studying technological engineering fields, whereas only 15% among women. Among those studying technological courses, no difference was found between men (M=3.89, SD=0.62) and women (M=3.69, SD=0.43) in their level of command of ICT (t=1.71, n.s.). Also among students taking non-technological courses, no difference was found between men (M=3.45, SD=0.66) and women (M=3.36, SD=0.38) in their levels of command of ICT (t=0.95, n.s.). Accordingly, we can posit that the difference found between men and women in general for their command in the use ICT stems from the larger proportion of men studying technological engineering fields compared to women.

Among students whose fathers had a high school or lower education, we found that graduates of private high schools had an advantage in their command of information literacy, compared to students whose fathers had a graduate or higher degree. For the latter, the graduates of public schools had the advantage. A possible explanation for this may lie in a factor related to success in studies—parental expectations of their children. A study that was conducted in the University of Illinois in Chicago [8] found that parents’ expectations influence the scholastic achievements of their children: 1. The more parents believed that their children will continue to higher education, the greater the children’s achievements were; 2. Parents’ beliefs that their children will continue to higher education led to their children perceiving their parents’ expectations more clearly, which led to their own expectations of higher achievements in their studies, and these led to higher achievements; 3. Parents’ beliefs that their children will continue to higher education led to their children perceiving their parents’ expectations more clearly, which led to the children investing more time in their homework, and this led to higher achievements.
Accordingly, it would appear that students whose fathers had a high school or lower education and who were sent by their parents to a private school felt a stronger expectation on the part of their parents and a stronger obligation to succeed. This is in contrast to students whose fathers’ had a graduate or higher degree, who probably felt that they had a “bar” to meet, even if they were sent to a public school. In opposition, students attending a private school see higher education as the norm, do not feel that their parents made any special investment and do not display any special effort or achievements.

It was found that among students whose Psychometric Test score was 600 or below, students that attended a private high school had an advantage in command of information literacy. For students whose Psychometric Test score was 600 or above, no similar significant advantage was seen. In practice, the higher the student’s score, the smaller the difference between private high school and public high school attendance.

Reviewing the information booklets of different psychometric test preparation companies, it appears that, in general, the improvement rates of students, after having taken the test once, range between 100-130 points if they take a course. Consequently, a student starting from a low point of origin will remain, most likely, in the lowest score categories. These students, usually, were also weak students in high school.

From interviews that we conducted among teachers in public and private high schools, we saw that private schools invest many resources in encouraging learning among weaker students, in comparison to public schools. This situation is due to private schools have the privilege of discontinuing a student’s studies, and therefore, not infrequently, weak students drop out of private schools—which is harmful to the financial interests of the school. It may be that this is the reason why the higher the student’s score on the Psychometric Test, the smaller the difference between the public and private school graduates’ command of the skills.

7.2. Research and social implications

The results presented herein are significant primarily for high school principals and educators. The findings can be implemented in the planning of effective policies, which should pay attention to the gaps between different student populations are differentiated from each other by factors such as gender, previous educational achievements, socio-economic status and the like.

High school principals must recognize the skills of the 21st century, as well as factors such as gender and parental education that impact upon them, and the variables that may be affected by them. In order to create a more equitable educational system, which relates to unique characteristics of varying populations that influence the success of students later on in their academic lives, the issues discussed here must be considered.

8. References


1. Scope

The relationship between poverty and its associated risk for mental health issues in youth needs deeper attention because it “is both straightforward and complex in its pervasive reach” [2]. In Canada, 1 in 5 children live in poverty [1], People for Education, 2013. Concurrently, over 1 million youth suffer from mental health issues in Canada and adolescent suicide rates are the third highest among the Organization for Economic Cooperation and Development (OECD) countries, with suicide as the second leading cause of death for those aged 15-24 [8]. The effects of mental health on education success and the intersection between poverty and mental health issues have been identified as barriers to the most vulnerable students in Canada and globally [6], [7], [11].

This research paper narratively deconstructs participants’ unconscious assumptions associated in the intersection of poverty and mental health issues in secondary school curriculum and education. Based on the author’s prior longitudinal research program, this research fills an emerging gap by narratively deconstructing the complexities of poverty and mental health issues using multi-modal narratives of adolescent students, educators, parents, and community members. Themes will be discussed in the paper, including: unconscious assumptions as ‘aha’ moments by students and school participants; revelations of educators’ own stories of poverty and mental health to take up further curriculum strategies; students’ openness to problematize solutions to the stigma of poverty and mental health to take up further curriculum strategies; students’ openness to problematize solutions to the stigma of poverty and mental health issues; and 4) multimodal narratives as social justice literacy. Narratives will be illuminated as a united voice and literacy platform. In so doing, the study offers the possibility for all students (and their families and educators alike), the dignity of respectful, equitable, and bias-free educational spaces to learn and teach.

2. Objective and Motivation

Inappropriate language, behaviour, and attitudes have long-lasting impact and cannot continue on the grounds and origin of ignorance in our schools. Given the immediacy in Canada of Ontario’s Poverty Reduction Strategy (2014-2019), and the effects of biased assumptions that perpetuate notions of students’ (in)ability to succeed [9], this paper is a call for social justice reform because, “Realizing people’s dignity, worth and self-determination on an equal basis with others is fundamental to advancing the human rights of people…” (Ontario Human Rights Commission, 2012, p. 9).

The research text for this paper is drawn from a large research site. Forty participants and research collaborators include: 10 secondary students, 6 cross-grade teachers, 3 school administrators, 5 community workers, 5 parents, and 15 members of a collaborative school board team of consultants, psychologist, and community outreach workers. Data collection includes: two focus groups, two conversational interviews, field notes of workshops and professional development, interpretations of multi-modal narratives, observations in classrooms, and a survey to the school community.

The method that underpins this study is narrative inquiry as it represents stories as lived and told through participants’ own life experiences [3], [4], [5]. Initial results suggest that multimodal narratives may serve a deepened purpose towards social justice related to poverty and mental health programming in schools.

3. References


Differential Susceptibility to Environmental Influences: Who is Affected by What Media Content under Which Circumstances

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1. Scope

“The influence of an early condition, intervention, or other basis for predicting diverging individual differences over time will be greater if it produces differences opposite in direction from the developmental changes expected normatively for that outcome. Conversely, if the antecedent produces differences favoring the developmental direction that is normatively expected, its effects will be attenuated, and harder to detect” (p. 1, Wright, 2001). Children are more or less susceptible developmentally due to specific cultural, linguistic, familial, societal, and media-related socialization experiences. Susceptibility is not a single quality. A child may be susceptible to some sorts of environmental hazards or buffers and not others. S/he may be susceptible along some developmental outcomes but not others. Content of exposure and the context in which that exposure occurs are both crucial factors in determining how media will influence development. Recent research using an ecological approach indicates that statistically modeling multiple proximal (e.g., parenting behaviors, sibling presence) and distal (e.g., at-risk status, family resources, parental education) factors individually and in combination help to present a more nuanced and balanced view of who, how, and under what circumstances screen media differentially affect young children. When child factors, content attributes, and contextual features are included in models, effect sizes for the most "susceptible" children tend to be much larger than for children progressing normatively.

2. Objective and Motivation

The purpose of this symposium session is to present evidence that supports the differential susceptibility model of environmental influences using parenting and media effects and content categories and media effects as examples. By understanding just which children are affected by what content under what circumstances, we can design more effective interventions to increase the likelihood of positive developmental outcomes while mitigating poor outcomes.
Session 9: ICT and Science Education

Quantifying Children’s Perceived Gender Roles and Attitudes Towards Women in Computing Science
(Authors: Ava Solez, Connie Yuen, Maria Cutumisu)

Online Social Interaction Attitudes and Online Interaction Involvement among Young Adults and People Aged over 45
(Author: Ju-Chun Chien)

ICT in Teachers’ Professional Knowledge
(Author: Fawzieh Makkawi)
Quantifying Children’s Perceived Gender Roles and Attitudes Towards Women in Computing Science

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Abstract

This research aims to address the acute issue of the retention of female students in STEM domains. Specifically, this work proposes a three-year longitudinal study surveying the attitudes and beliefs of junior high-school students towards gender roles in computing science. This study will contribute to the understanding of how role models influence students’ attitudes towards computing science.

1. Introduction

There is a well-documented lack of gender parity in computing science enrolment at university and a subsequent dearth of females in the technology sector. Current estimates suggest that only 14.1% of North American computing science bachelor’s degree graduates are female [1]. Previous studies have shown that the presence of female role models positively impacts a girl’s decision to pursue Science, Technology, Engineering, and Mathematics (STEM) careers [2], but the social atmosphere in a computing science classroom can waylay even that desire [3]. In an effort to encourage female inclusion in what has hitherto been a male-dominated computing science social sphere, researchers need to reassess the direction of interventions designed to encourage female participation in computing science. Specifically, researchers need to begin to look at how the attitudes of males can be more inclusive to females and not solely at how females can be encouraged to overcome their misgivings in the current situation.

2. Literature Review

This study accounts for the need to change social realities in the computing science classroom, while considering the limited resources of public schools, to guide future interventions aimed at normalizing female participation in STEM careers. The proposed study builds on the positive findings of the effectiveness of 1) female role models on the attraction and retention of girls in technical fields [2, 4, 5] and 2) reconciling the perception and self-identification with the personal attributes of computer scientists [6]. Thus, the objective of the current study is to quantify any changes in both girls’ and boys’ perceived gender roles and attitudes towards women in computing science.

This study will contribute to the understanding of how role models can change the gender dynamics of a traditionally-male social domain, such as computing science. In addition to providing a better understanding of the use of role models to encourage female participation in computing science, this study will provide insights about how female role models affect male participants’ perceptions of computing science. This is of particular importance because recent studies suggest that the social exclusion experienced by female computing science students from their male peers is a leading factor in female attrition from, and avoidance of, the discipline. The lack of highly qualified female role models in computing science at the junior high level may contribute to male students perceiving their female peers as outsiders in the field of computing science, despite documented parity in overall STEM achievement at the secondary school level [7]. Therefore, the research will test the hypotheses that female role models will 1) help girls identify computing science as a viable career choice and 2) change boys’ perception of computing science as a male-dominated discipline to a gender-neutral discipline. Thus, this study will make new inferences about how changes to male perceptions of gender and computing science can be achieved and potentially implemented within the school by emphasizing the positive effect that female role models have shown to exhibit on female students. By uncovering methods that foster a gender-inclusive culture in computing science, this study will encourage female students to pursue and continue in the discipline.

3. Methodology

The study will be conducted over three years at a local junior high school in a core-subject classroom in Western Canada. Grover, Rutstein, and Snow have shown that middle school students have misconceptions about computing science and that an introduction to computational thinking can spark an interest in this career path [8]. Middle school is an
ideal time to change student opinions of computing science, as past studies suggest that children self-select an interest in computing science before high school [9]. Additionally, the use of a core subject classroom will allow for a participant pool that is more representative of the general population and consistent year-to-year, as participants’ attitudes change with age.

A pre-intervention survey of attitudes and beliefs towards gender roles in computing science will be administered to the participants. This will be followed by an intervention consisting of an instructional session featuring a female computing scientist working and teaching in a confident and effective manner. The manner of instruction is very important for the study, as previous studies including interventions by female leaders have shown that the self-efficacy of teachers is important to the interpretation of message received by participants [10]. Following the intervention, participants will complete a post-intervention survey to measure any changes in their attitudes and beliefs compared to the pre-test. This process will be repeated annually to track changes over time. Any changes due to continued exposure to female role models will be recorded and analyzed to determine the extent to which computing science culture can be affected.

4. Conclusion

This research proposes a three-year longitudinal study of junior high-school students’ attitudes and beliefs towards gender roles in computing science. This work will help inform the design of future interventions targeting the retention of female students to ensure gender parity in STEM domains.

5. Acknowledgements

We would like to express our gratitude to the Faculty of Education (Support for the Advancement of Scholarship Grant # G018000473) and to the University of Alberta (Roger S. Smith Undergraduate Research Award) for their generous support.

6. References


Online Social Interaction Attitudes and Online Interaction Involvement among Young Adults and People Aged over 45

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1. Objective

The purposes of this study were mainly to examine whether there were differences in online interaction attitude, attitude towards making friends online, and online interaction involvement among three different age groups (high school students, college students, and people aged over 45), four attachment styles, and making friends online experience. Moreover, this study would further examine which factors would be more impactful than others on the online interaction involvement.

2. Participants

Schedule of formal data gathering was from May 18 to June 1, 2016. There were 539 valid participants in this study, about 37.7% were high school students (n = 203), 39% were college students (n = 210), and 23.4% were people aged over 45 (n = 126). Overall, the large majority of participants had a secure attachment style (352, 65.3%), the second most frequent attachment style was preoccupied (99, 18.4%), the third most prevalent style was dismissing (49, 9.1%), and only 7.2% had a fearful attachment style (n = 39). About 55.3% of participants had made friends with people online (n = 298). The average period of time per day to involve in online social interaction was 3.38 hours (SD = 2.90). About 71.4% reported that online social interaction did have a positive impact on their overall interpersonal relationship (n = 385).

3. Instruments

There were four self-developed questionnaires in this study: the Attachment Styles Scale (ASS), the Attitudes towards Online Interaction Scale (ATOIS), the Attitudes towards Making Friends Online Scale (ATMFOS), and the Online Interaction Involvement Scale (OIIS). There were 1110 participants (ages 10 – 80) to establish the questionnaires’ validity and reliability.

Item analysis, item-to-total correlations, and the exploratory factor analysis (EFA) were used to examine the questionnaires’ construct validity. Cronbach’s alpha coefficients were used to examine their reliability. The results revealed that these questionnaires were well-developed instruments.

4. Results

A one-way ANOVA was conducted to determine if differences in “online interaction attitude”, “attitude towards making friends online”, and “online interaction involvement” occurred among three different age groups, respectively. The results indicated that high school and college students had a more positive attitude towards making friends online than the people aged over 45.

A one-way ANOVA was conducted to determine if differences in “online interaction attitude”, “attitude towards making friends online”, and “online interaction involvement” occurred among four different attachment style groups, respectively. The results indicated that people with dismissing attachment style had more involvement in online social interaction than people with secure attachment style.

A one-way ANOVA was used to investigate whether making friends online experience had a significant difference on “online interaction attitude”, “attitude towards making friends online”, and “online interaction involvement”, respectively. The results showed that for those who had made friends with people online had more positive attitudes towards online interaction, making friends online, and more online interaction involvement than those without the experience.

Pearson’s correlations were used to test associations among the target research continuous variables. The results indicated that “online interaction involvement” was significantly and positively associated with hours (r = .16), online interaction attitude (r = .36), attitude towards making friends online (r = .44), preoccupied (r = .27), fearful (r = .33), and dismissing (r = .26) style.

A multiple regression analysis was applied to determine which variables were the best predictors of online interaction involvement. The first three predictors were attitude towards making friends online (β = .33), fearful attachment (β = .23), and online interaction attitude (β = .15).
ICT in Teachers’ Professional Knowledge

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Abstract

The continuous fast developing field of Information and Communications Technology (ICT) is affecting every aspect of our life including education. The purpose of this research is to show the importance of ICT knowledge in Teachers’ education journey (preservice and inservice). The first section of this paper discusses the teacher’s professional knowledge. Section two discusses ICT in Education. Section three discusses the importance of TPACK (Technological Pedagogical Content Knowledge) model. Section four and five discuss preservice teachers’ education and inservice teachers’ training respectively. Finally, in the digital world we are living, teachers need to be digitally knowledgeable to be able to lead the students to be critically engaged active members.

1. Introduction

The continuous fast developing field of Information and Communications Technology (ICT) is affecting every aspect of our life including education. Teachers and schools are no more the only source of information. This has deeply affected teachers’ role, their education, and the required professional knowledge and development. This paper examines the necessity of ICT knowledge in nowadays teachers’ professional knowledge and its correlation with pedagogy and contents. This is discussed in four parts: teachers’ professional knowledge, ICT in education, preservice teachers and inservice teachers.

2. Teachers Professional Knowledge

According to Bromme, ‘professional knowledge seems to be sufficiently described by ‘subject matter,’ ‘pedagogy,’ and ‘specific didactics’’ [2]. Teachers’ professional knowledge has undergone multiple transformations in the recent decades.

SITES2006, an international comparative study of pedagogy and ICT use in schools, defines the 21st century skills as “the capacity to engage in lifelong learning (understood as self-directed and collaborative inquiry) and as connectedness (communication and collaboration with experts and peers around the world)” [15]. In line with this, 21st century teachers are expected to empower students to become lifelong learners; that is, teachers need to promote students’ critical thinking skills, autonomous learning and collaboration to face the challenges of a rapidly changing world. To this end, teachers themselves need to be equipped with adequate professional knowledge so as to fulfill the social economical expectations and maintain the social trust in their professional work.

3. ICT in Education

ICT is penetrating in every aspect of our life, and education is not an exception. Educators need to use ICT in their learning and teaching process because it can facilitate and enhance the learning progress, and because it is a must to know how to use ICT in our life.

3.1. ICT impact on teachers’ role

Education is undergoing a serious radical obligatory revolution. The Internet, the spread of information from diverse sources and the use of different multimedia provided everyone with the opportunity to learn anything, anywhere, anytime, and in many different ways! This change has vitally affected teachers’ main role. Teachers are expected to prepare students to live and contribute to their own community and to the global world. In order to carry out their new role successfully, teachers need to understand, acquire and be expert in their students’ digital native language [20] and environment.

From a different perspective, ICT extends the learning process outside school walls and renders it ubiquitous. ‘The old certainties of a world defined by four classroom walls and impermeable boundaries have disappeared forever; replaced by global interdependencies and complex systems that require flexibility, responsiveness, and imagination’ [11]. Teachers can now reach their students anytime and anywhere, and they can easily cooperate with them...
and with students' parents. Moreover, different ICT tools and services accommodate several educational strategies: inclusion, differentiated learning, and personalized learning. Using different levels of educational software is a simple example of personalized learning. So, being ICT competent empowers teachers to reach every student and is consequently expected to have a positive impact on students’ attainment, and therefore being ICT competent is not a choice anymore.

3.2. ICT in education training and framework

At the beginning, most training efforts focused on providing teachers with simple computer skills: how to operate hardware (computers, peripherals, and later on interactive whiteboards) and how to use simple software. However, it was not so long until educators found out that possessing ICT skills alone is not affecting the teaching process.

Education leaders noticed that it was not enough to train teachers on how to use ICT, but the most important is to make sure that teachers use ICT effectively in their work and get the most out of it to enrich their professional development and their students’ achievements. Hence, the attention shifted to the effective use of ICT in education. “Technology integration” became the trend. Other initiatives and framework began to appear. Integrating technology in education has been widely discussed and researched. The combination of technology, pedagogy and knowledge has recently emerged by building on the pedagogical content knowledge (PCK) framework introduced by Shulman [23].

4. TPACK

‘By introducing a model of technology that considers how the components of content, pedagogy, and technology co-constrain and intertwine, we have offered both a theoretical model (TPCK) as well as a potential analytical one for studying changes in teachers’ knowledge about successful teaching with technology’ [13].

4.1. TPACK background

Koehler et al. [14] began their investigation of the connection between content, pedagogy, and technology in 2002 at Michigan State University, where they conducted a research-based study of the development of these ingredients (content, pedagogy, and technology, and their complex interrelation) through a learning by design approach where faculty members and graduate students cooperated together in a semester long term to design an online Master level’s course. As a result of this study, Koehler et al. offered their first model of how content, pedagogy and technology are related.

Koehler et al. [14] noticed the ineffective old way of faculty technology development, where faculty members were given ICT skills training separately from pedagogy and content. They approached their new suggested development with the idea: ‘there is no single technological solution that applies for every teacher, every course, or every view of teaching’ [14]. Faculty members enrolled in a master course in designing educational technology and working groups were formed by teaming a faculty member with each couple of master students. Their project was to form an online course that faculty members would be teaching in the next academic year. Therefore, instead of giving the course material to the IT department to transfer it to an online course, faculty members actually participated in designing the online course with graduate students. The authors, of whom two of them were the instructors of the mentioned course believed in the design-based method for its efficacy in studying complex and interconnected concepts, and were eager to see the result of this research.

4.2. What is TPACK?

TPCK stands for technology pedagogy content knowledge. As described previously, it is ‘the result of 5 years of work on a program of research focused on teacher professional development and faculty development in higher education’ [17]. It is now referred to it as TPACK [6]. TPACK was based on Lee Shulman’s [23] research, where he teamed the pedagogy and the content knowledge (PCK).
TPACK framework (Figure 1) highlights the necessity to help teachers realize the relations among content, pedagogy and technology, as well as the need to support them in the practical implementation. Koehler and Mishra [12] recommended that “expert” teachers need to be knowledgeable in the three components of the TPACK framework: technology, pedagogy, and content, and the composite relation among each other. This newly emerging combined knowledge is not easily acquired and it needs time, testing, reflection, and continuous follow-up of upcoming educational technology and theory.

5. Preservice Teachers

To ensure a change in the use of ICT in schools, change should begin in preservice teachers’ education.

5.1. Preservice teachers’ education and beliefs

Despite all the debates about the usefulness of integrating ICT in education, researchers agreed on the importance of including ICT training in preservice teachers’ education [25]. Technology in education is expected to enhance the learning process and support the 21st century skills like critical thinking and problem solving skills, as well as facilitate and empower cooperation and collaboration processes.

According to Pajares [19], beliefs are often strongly rooted and they are not easy to change. Several research studies asserted the direct relation between teachers’ knowledge and beliefs and their teaching and learning practice in schools [9]. Teachers’ educators need to keep on evaluating their preservice education programs to embrace the effective use of ICT in education, and to prepare teachers for the information age. “Strong preservice education on the use of ICT is also important because it can help to counter the possibilities of transmission-oriented school practices in the assimilation of beginning teachers.” [3].

As per Guskey [8], to reach a change in practice, beliefs need to be changed before. However Thompson et al. [24] have another point worth considering: beliefs and practices influence each other, i.e. a change in beliefs may result in a change in practice, and vice versa.

5.2. Preservice teachers’ educators practice and beliefs

Grove et al. [7] argued that preservice teachers need to be trained with tech savvy teachers, who are actually integrating ICT in their teaching and learning process and have faith in it. They also need to get enough access to educational technologies (software and hardware). This is to ensure a right base building for technology integration. Some higher education faculty members consider learning new educational technology a waste of time and they prefer to invest their time in taking care of their course content and teaching pedagogies. [14]

However, faculty members need to be role models in their effective use of ICT in the teaching and learning process. Mumtaz [18] noticed that the way ICT is used in higher education and the type of ICT training faculty attended highly affected how students will be using ICT in their upcoming teaching career. Russell el al. [22] also urged education departments in higher education to effectively train preservice teachers on how to integrate ICT in their teaching and learning process. However, this change is crucial, digital native students [20] need ‘digitally learned teachers’. ‘Preservice teachers must routinely encounter the effective infusion of technology in the normal course of their learning at the university and in their practicum placements in schools’ [11]. Preservice teachers need to be exposed to technology in their education, have the opportunity to practice their teaching training with teachers adopting ICT integration, and get enough time to explore the benefits of educational technologies.

6. Inservice Teachers

The information age is forcing the need of technically knowledgeable population and workforce to keep the development and innovation rolling on. This emphasizes the importance of well experienced teachers in embracing ICT in students’ life: enhancing their ICT skills and empowering its use as a learning and communication tool. Recommending adequate ICT knowledge education or TPACK education for preservice teachers will not at any point eliminate the vital need for related continuous professional development for inservice teachers. Different reasons are behind this statement and will be discussed in this section.

6.1. Teachers’ education

Most teachers nowadays did not get the needed educational ICT skills and knowledge in their previous education. Integrating ICT in education is not yet available in all preservice teachers programs [16], and if ever available, only few ICT in education related courses are given to preservice teachers [17]. Although we started to have the digital teachers or the net generation teachers (the digital students who became teachers) integrating ICT in education is still primitive. These teachers may have a better attitude towards the use of ICT in general, since they are digitally fluent, but this did not show a successful
integration. Add to this, the former teachers who never encountered ICT in their education, and got simple ICT skills training sessions only. That’s why well designed and planned technology integration continuous professional knowledge is needed. In order to keep this on the right track, headteachers, school leaders and administrators need to be included in the professional development process to ensure a constant school improvement and not to leave things dependent on teachers’ acceptance or resistance level.

6.2. Teachers’ attitudes

Different barriers to technology integration were discussed and examined by researchers. Main barriers are lack or inadequate training, not enough resources (hardware or software), absence of internal support, ambiguity regarding the role of ICT in education, overloaded agenda and insufficient time to learn or practice the use of technology, and restricted curriculum leaving no space for technology integration [25].

Ertmer [4] discussed two types of barriers when discussing teachers’ use of technology. First-order barriers are external barriers that are not caused by teachers themselves, like lack of resources, training or support. Second-order barriers are those internal to teachers, like their attitudes and beliefs towards using technology. Both types of barriers are essential and should be dealt with to reach an optimal ICT usage. However, solving the second-order barriers is much harder. Add to this that if teachers were convinced of the importance and usefulness of ICT in their teaching and learning process, they may participate in solving the first-order barriers by taking responsibility for providing adequate software, hardware, training and support. Albeit, having a well technology furnished school will have minimal effect on teachers’ beliefs and attitudes unless these issues were addressed directly in the school continuous professional development.

Despite all the training sessions provided to teachers in the use of ICT, researchers and educators found that in most of the studied cases, teachers did not yet reach a fulfilling use of ICT in education [1]. Teachers’ negative attitude towards ICT use in education is not originating only from the difficulty of the technology, but also from teachers’ disbelief of the constructive impact of technology integration in the teaching and learning process. Some teachers may be counted as ‘technophobic’ [21], and therefore resisting any educational reform using technology because of their incorrect beliefs. Well-designed continuous learning process and professional development, close support, and enough resources are key elements in changing teachers’ attitudes and beliefs towards an active use of ICT in education.

6.3. Current status of ICT integration

Introducing the ICT in education was supposed to be an important key factor in education reform. However, that was not the case. Educators’ improper use of ICT was claimed to be the reason behind this failure. Most teachers are using ICT to support their old teaching strategies and not using it to enhance learner centered teaching approach. That was seen also with new teachers, who possess good ICT skills [22]. That’s why supporting educators for an effective use of ICT became a main concern.

6.4. Continuous Professional Development

Hargreaves and Fullan [10] argued that the new professionalism stresses hardly on teachers’ continuous self-learning and development. Teachers need to keep up with every progress or invention of anything related to education that can enhance their teaching and learning process from educational technology or learning theories. The new professionalism also highlights the interaction of teachers with their colleagues outside the classrooms and with the whole community outside the classroom. This could begin in teachers’ education institution, but it will flourish, mature and continue to grow during their work, i.e. in service. Hargreaves and Fullan [10] noticed that schools nowadays are not very well designed or do not accommodate for such a continuous professional development. Teachers are most of the time overloaded with their own work, restricted to long curriculum to finish, and are not provided continuously with well framed professional development and enough support.

Most available ICT training for teachers did not fulfil teachers’ need in integrating technology in education. These training sessions were basically informative and tend to build ICT skills. It did not take into consideration the teaching pedagogy and contents, and it did not accommodate for the long time needed to reach a stable educational practice [16]. Short term training sessions are not enough to enable teachers to effectively integrate technology in their teaching and learning procedures. Interactive, practical, and long term professional development, and which is directly related to the curriculum is much more effective. Such professional development has ‘easy to digest’ chunk of information and consequently easier to implement, and it is less stressful in the change process.

7. Conclusion

Although ICT came in to education with lots of hopes and expectation to education enhancement or even reform, challenge accompanying this could never be ignored and should be taken care of and
dealt with. Training teachers to use ICT effectively in education cannot be done through simple ICT skills training sessions. “It requires appreciation of the complex set of interrelationships between artifacts, users, tools and practices. In particular, it requires teachers to become sensitive to the demands of harnessing and integrating technology, pedagogy and content.” [13]. TPACK was largely welcomed, and researchers [3] saw what is available so far a descriptive model of the TPACK and they encourage educators to use this framework to have more practical comprehensive understanding for the framework and for the relationship of each item of this framework to the other.

Teachers need to be tech savvy and not technicians. They need to know how to operate technology and have simple troubleshooting notions. It is not possible to ask for help from the IT support division just to connect a loose electricity cable for example. They need to be knowledgeable in some productive programs to process their own teaching, learning and education management materials, like word processing, spreadsheets, presentations, and simple image and design programs. They need to be at ease in using the Internet for communication in every direction: with their students, with their colleagues, or other teachers around the world through specialized networks, with school administrators, students’ parents, and the whole community. They need to be up-to-date with multimedia programs and educational platforms to support their teaching materials and strategies and to enhance students learning and achievements. They need to have a good idea about the available ready-made software or educational materials that could be suitable for their own curriculum. They need to have basic ICT terminology in case they needed to follow up a new issue or search for help.

The philosophy that technology can be used only as a supplement to the existing pedagogical practices has significant implications on the teachers’ professional knowledge. In particular, it accentuates the teachers’ impression of the redundancy of any adequate preparation to more effective ICT use. In line with this, Ertmer and Ottenbreit-Leftwich [5] call for shifting the teachers’ mindsets away from such philosophy and assuming the necessity of technology for promoting students’ performance.

‘Learning how to teach and learn in new ways with technology requires imagination, intellect, creativity, and no small courage.’ [11]. That’s why high quality initial education is needed in preservice with a continuous updates of teachers education programs; in addition to a related continuous professional development inservice with the perpetual presence of support. School leaders, head teachers and administrators should be always included in this education and professional development.

8. References


Session 10: Inclusive Education and Practices

Knowledge of Pupils with Special Educational Needs and Schools’ Capacities for Inclusion: The Case of High School Teachers in Ilorin, Nigeria
(Author: Olaniyi Bojuwoye)

Autistic Learners’ Inclusion in the Universal Basic Education Programme in Nigeria
(Authors: Kenneth Kelechi Obasi, Adanma Ngozi Ohia)

The Nationalistic Impulse: How Primary and Secondary Schools Reflect the Canadian Indigenous Experience
(Author: Frank Deer)
Knowledge of Pupils with Special Educational Needs and Schools’ Capacities for Inclusion: The Case of High School Teachers in Ilorin, Nigeria

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Abstract

The abstract is to be in fully-justified italicized text, at the top of the left-hand column as it is here, below the author information. Use the word “Abstract” as the title, in 12-point Times, boldface type, centered relative to the column, initially capitalized. The abstract is to be in 10-point, single-spaced type, and up to 150 words in length. Leave two blank lines after the abstract, then begin the main text.

1. Introduction

Policy provisions for special and inclusive education have been made in Nigeria. For instance, the National Policy on Education, first published in 1981 and revised in 2004, has a section on Special Education with two broad objectives – to give concrete meaning to the idea of equalizing educational opportunities for all children irrespective of their disabilities and to provide adequate education for all children and adults with special needs in order that they may fully play their roles in the development of the nation [10]. Emerging from the National Situation Analysis Report, on Special Education in Nigeria, submitted to the Federal Ministry of Education, FME, is the document referred to as “National Policy on Special Needs Education in Nigeria” [12]. Further effort at putting into practice this National Policy on Special Education is the publication on the “Implementation Guidelines on the National Policy on Special Education in Nigeria” [12]. Further effort at putting into practice this National Policy on Special Education is the publication on the “Implementation Guidelines on the National Policy on Special Education in Nigeria” [12]. However, despite efforts to carefully articulate a conceptual framework for “Special Education” in Nigeria, and to advance sound rationale for access to appropriate education for persons with special educational needs, practices in schools have not been consistent with the guidelines for achieving access and equity as prescribed by UNESCO [27] for inclusive education. Including especially for persons with disabilities.

It has been observed that whenever there is a discussion on the difficulties of implementing special education policy there is general agreement among stakeholders that such difficulties usually revolve around the school system’s lack of knowledge about specific disabilities of their pupils and also the school system’s lack of capacities for addressing the educational implications [17]. Specifically, the basic issues revolving around the practicalities of implementing special and or inclusive education in schools have been found to include access, identification and assessment, support and capacity for inclusion.

Major issue with regard to identification of persons with disabilities has to do with the process beginning as early as possible. Early identification, according to National Disability Authority [17], is to ensure that intervention is provided at earliest age and, by so doing, to prevent the development of secondary behaviour which could endanger progress in school. UNESCO [27] also notes that early detection or identification and access are necessary in order to provide early intervention and support services which can stimulate early development of the children’s potentials and prevent onset of severe secondary disabling conditions. Absence of early identification could translate to mean that children with special educational needs may enter school undetected and, therefore, not provided with appropriate support services. The general contention, among stakeholders, is that children’s needs should be identified prior to entering school and that those children identified with special needs should have all necessary support from the start of their school careers [17].

Proper identification is predicated upon appropriate data collection or assessment process. Both National Disability Authority [17] and Guide to Disability Act [13] indicate the need for psychological services system in schools for the assessment of individual health service and education needs for persons with disabilities. Both systematic and non-systematic assessment procedures, when employed appropriately, should yield data needed to ascertain whether a person has disability, the nature and extent of the disability, the health and education needs arising from the disability and the services considered appropriate to meet those needs [13]. For instance, gathering information for the recognition and identification of barriers to learning can be done by systematic observation by teachers and by interview [28], while a good assessment report should help to suggest teaching
strategies to support particular learning needs of a child with learning disabilities or barriers to learning [17]. Although a good assessment report should suggest intervention strategies to employ for identified disabilities, however, actual decision on what intervention to employ does not depend on the assessment report alone but also on the school’s resources. A very important resource for schools is a psychological service unit which plays very useful role in assessment process for the identification of disabilities and intervention in case of problems [17]. Where a school cannot afford a psychological service unit some form of access to private psychologists is suggested. Engelbrecht [8], however, is of the view that a better model of addressing problems is for schools to have Teacher Support Teams. Teacher Support Teams are a system of support from a team of class teachers [5]. The model, which focuses on preventative and promotive strategies, operates with each individual class teachers requesting support from the school’s teacher support team.

Many countries adopt the Teacher Support Teams model as very important schools’ resource for delivering support to pupils with special needs in their local schools and communities. Teacher Support Teams provide direct support to class teachers and indirectly to pupils. A school’s Teacher Support Team serves as avenue where teachers can exchange ideas, air feelings and work on problem solving around issues relating to the teachers’ work in the classroom. This model of support avoids making referral to specialist services outside of the school while offering opportunity for pupils to be supported in their ordinary schools and classrooms [26].

2. The study

As also indicated in the literature, the assumption that led to this study is that the difficulties in implementing special and inclusive education in Nigeria most probably revolve around school system’s lack of knowledge of their pupils with disabilities and lack of capacities for addressing special educational needs of their pupils living with disabilities. Therefore, the goal of the study was to investigate this assumption. Specifically, the study explored the teachers’ knowledge of their pupils with disabilities and their schools’ capacities for addressing special education needs of pupils with disabilities. The specific research questions that guided the study are:

- Are teachers aware of their pupils with disabilities and how the disabilities affect the pupils’ potential to learn?
- Do teachers have the capacities for identifying pupils with disabilities?
- Do schools have resources (e.g. school psychological services) for assessment of pupils to identify those with disabilities?
- In the absence of the schools’ own resource, such as school psychological services, are schools aware of where to go for the assessment services (hospital-based or private psychologist outfits outside of the schools)?
- Do schools, as a policy, admit all pupils with or without disabilities?
- Do schools restrict admission to pupils with disabilities?
- Are schools’ facilities disability friendly?
- Do schools make allowances and accommodation for pupils with disabilities?
- What forms of support do schools provide for pupils with disabilities?
- Do pupils with disabilities have difficulties accessing the support required to enable effective learning?

3. Methodology

3.1. Research Design

The study adopted a qualitative approach which facilitated an exploratory study in order to gain insight into the participants’ comprehension of the phenomenon being investigated [1]. The study explored teachers’ knowledge of their pupils with disabilities, their schools’ capacities for addressing special educational needs of pupils with disabilities and the latter’s inclusion in all learning activities of the schools. Qualitative approach helped researchers to describe and interpret participants’ perceptions, attitudes, beliefs and feelings relevant to teachers’ knowledge of their pupils with disabilities and their schools’ capacities to address special educational needs of pupils with disabilities [24]. Adoption of a qualitative approach helped to place study participants at the center of the actions, ideas, values and meanings that constituted the critical information needed for the study [15]. Data gathering involved interactions with participants permitting the qualification of ideas, values, and meanings through the eyes of the participants rather than quantification through the eyes of outside observers [15].

3.2. Participants

Teachers in public secondary schools in Ilorin metropolis, Kwara State, Nigeria, constituted the population for the study. As major stakeholders in any educational enterprise, teachers play vital role in facilitating meaningful and effective learning experiences in schools. Teachers are also considered
as most appropriate participants for this study because of the importance of their perspectives in any school matter as it is estimated that teacher factor is the most important of any other school factor [2].

One hundred and forty teachers from randomly selected secondary schools in Ilorin metropolis were involved as participants of this study. They comprised 80 females and 60 males with a mean age of 35 years and teaching experiences of between five and above twenty years.

Convenience sampling technique was adopted in selecting the teacher participants. Convenience sampling is a non-probability technique where subjects are selected because of their convenient accessibility and proximity to researcher. Many researchers also prefer convenience sampling technique because it is quick, inexpensive, easy, and subjects are chosen because they are easy to recruit [9]. Moreover, convenience sampling is appropriate when populations are difficult to access due to bureaucratic public service regulations as was the case in this study [4].

3.3. Data Collection

The study collected qualitative information in terms of the participants’ knowledge of their pupils with disabilities, the participants’ opinions as to their schools’ capacities for addressing special educational needs of pupils with disabilities and the latter’s inclusion in all learning activities of their schools. Semi-structured one-on-one interviews were employed to collect the data for the study. The interviews provided an opportunity for establishing rapport and communicating directly with participants in order to comprehend their views regarding their knowledge of their pupils with disabilities and their schools’ capacities for addressing special educational needs of their pupils with disabilities [24]. The interviews allowed participants to employ their own ways of defining their world [23]. Semi-structured interviews and open-ended questions allowed participants to elaborate on their answers and enable the researchers to work according to the principles of interaction. Interview questions employed for gathering data were informed by the knowledge gained from literature, and were designed to encourage participants to express their individual opinions in terms of their knowledge of their pupils with disabilities and their schools’ capacities for addressing special educational needs of pupils with disabilities. The interviews were tape-recorded and transcribed for data analysis.

3.4. Data Analysis

Data analysis involved engaging in multiple readings of interview transcriptions, coding, reviewing and refinement of data as well as crosschecking to ensure that themes that emerged from the data analysis correspond with the objectives of the study as reflected in the research questions. Data analysis was thematic and consistent with methods for identifying, analyzing and reporting themes within data [3]. Efforts were made to ensure that identification of emerging patterns in participants’ responses, to interview questions corresponded with teachers’ knowledge of their pupils with disabilities, their schools’ capacities for addressing special educational needs of pupils with disabilities and the latter’s inclusion in learning activities of their schools. Participants’ response patterns formed themes which were clustered into the following categories: teachers’ knowledge and awareness of their pupils with disabilities, teachers’ capacities for identifying pupils with disabilities, schools’ resources for assessment process to identify pupils with disabilities, awareness of resources, outside of the school, for assessment services, schools’ policy regarding admission of pupils with or without disabilities and support services for pupils with disabilities in the schools including allowances and accommodation for pupils with disabilities.

4. Results

An important assumption of this study was that the difficulties being experienced in the implementation of special needs and inclusive education in Nigeria were due to school system’s lack of knowledge of their pupils with disabilities, the schools’ lack of capacities to address special education needs of pupils with disabilities and schools’ limited capacities for inclusion of all learners in the learning activities in the schools. In view of this assumption this study obtained the views of teachers in secondary schools in Ilorin Metropolis, Kwara State, Nigeria. The study specifically explored the teachers’ knowledge of their pupils with disabilities as well as their schools’ capacities to address the special educational needs of the pupils with disabilities and the inclusion of the latter in all schools’ learning activities.

In terms of the teachers’ knowledge and or awareness of their pupils with disabilities the teachers interviewed expressed relatively limited knowledge of their pupils with disabilities except those with physical disabilities. The teachers involved in this study reported their inability to identify pupils with disabilities especially those not immediately apparent. Respondents expressed marked deficit in knowledge of specific disabilities in their pupils and they could not identify their pupils’ special educational needs or the types of barriers to learning pupils might be suffering from. The teachers expressed difficulties with linking pupils’ disabilities to their potentials to learn, or how
disabilities affect pupils’ potential to learn. The teacher respondents thus expressed relatively poor knowledge of the nature and characteristics of their pupils and the special educational needs of their pupils.

When asked about their capacities to employ appropriate assessment procedures to gather information with which to identify pupils with disabilities, the teacher-respondents stated that they lacked the requisite training to conduct assessment and to identify pupils with disabilities. When asked for the reason for their lack of ability to conduct assessment to identify pupils with disabilities the teacher-participants reported that in their pre-service educational preparation they were not trained, in pupil observation and interview with a view to identifying those with disabilities and their special educational needs or barriers to learning. The teachers also reported that they have not been subjected to in-service training through workshops and or seminars where they could gain such skills.

The study sought teachers’ opinions with regard to their schools’ capacities to address special needs of pupils with disabilities. The focus mainly was on the schools’ resources for intervention and support services for pupils with disabilities and their special educational needs. In terms of intervention in health matters, participants reported that schools usually made referrals to the government hospitals or health clinic nearby. However, for intervention in education and other psycho-social problems of pupils, schools were reported to lack appropriate resources. For instance, it was reported that schools do not have psychological services or experts as a resource for learning and intervention in problem situations. Teachers also reported lack of awareness as to where outside of the school to go to obtain psychological services except in the public hospitals. There is generally no support services structure for pupils with disabilities in the schools except the casual uncoordinated material, informational and emotional support services rendered by teachers.

Although schools don’t have policy for excluding pupils with disabilities the teachers complained of their lack of capacities for including pupils with special educational needs. Support services for inclusion were reported to be highly limited as respondents perceived the Ministry of Education not providing appropriate leadership. Schools, generally, have no disability-friendly facilities and no allowance or accommodation is made for pupils with disabilities such as pupils in wheelchairs to access the classrooms. Pupils with other types of disabilities are also not catered for. In general, the schools are reported to lack adequate capacities to deliver inclusive education.

5. Discussion

The classroom of today is diverse with each pupil different from the other [18]. Today’s classroom may comprise pupils from virtually all walks of life with some pupils from different cultural and or religious backgrounds; some gifted and talented; while others may be from different socio-economic backgrounds and some with a disability [21]. There is, however, the expectation that teachers would take responsibility to educate all the pupils in their classrooms despite the fact that they are not of the same knowledge, abilities or skills. To educate the students appropriately teachers must know their pupils very well enough. The first step in adapting everyday classroom to be aware of the individuality of each pupil in order to facilitate his or her learning needs [21]. UNESCO [27] had earlier emphasized that for inclusion to achieve its objectives, education practices must be child-centered. In this connection, a teacher must be aware of every factor that may be affecting a pupil in the classroom and adapt his or her teaching methods to accommodate the pupil’s needs.

In order to plan an appropriate instructional programme, to teach the skills a child needs to acquire, it is essential to carry out an assessment [18]. At the heart of “best practice”, in educating pupils with learning disabilities, is the use of assessment information to improve instruction [21]. The implication of this statement is that teachers must find out where each of their students are academically, socially, and culturally to determine how best to facilitate learning [14]. A logical consequence of this realization is that these teachers will need to acquire skills in curriculum-based and pupil assessment including assessing learning styles, cooperative learning strategies and facilitating peer tutoring, or social skills training. Moreover, since all students have difficulty at one time or another or to one degree or another, teachers are likely to meet children with some type of learning problems in their classrooms. Therefore, an understanding of pupils and their special educational needs is important for all teachers [18]. Where such understanding is lacking, the implication is that the teacher cannot facilitate effective learning by the students. When teachers have no access to pertinent pupil-information, as in the case of this study, the teachers cannot know the individual needs of their pupils, they cannot adopt their curriculum to address special educational needs of their pupils and they cannot effectively facilitate the learning of their pupils.

Two major issues related to identification and assessment are early identification of learning needs of pupils and access to assessment. Early identification ensures intervention at the earliest stage to prevent the development of secondary behaviours that could endanger children’s progress.
According to Rubin [20], early intervention has capacity to yield benefits in academic achievement, delinquency and crime reduction and labor market success among other domains. Restricted or no access at all to systematic psychological service may mean that children may be assessed at a much later stage or not assessed at all. In the absence of school psychological service and where there is no access to private psychologists, for assessment, as the case in this study, the implication is that children are not being assessed at all. Where there is absence of assessment tools in schools, the suggestion is for the coordination or partnerships between the different government’s departments (such as health and education ministries or departments) where there may be access to psychologists, psychiatrists, social workers and other psychological or health workers. It is also being suggested that partnership between public and private schools could be forged to avail the former of the latter’s expertise in various areas such as psychologists, counsellors, speech therapist, learning support teachers, etc. Reports have it that quite some private schools have these experts (or professionals) although many public schools are only staffed with school counsellors.

People with disabilities have need for high levels of support in their abilities to learn, communicate and cope reasonably independently. The focus of care delivery to people with a learning disability has changed in recent decades, from institutionalized care based on segregation and dependency, to care which is based on inclusion, rights of equal access to services and the right to lead an ‘ordinary life’ in the local community [7]. In the absence of support services to people with disabilities, as found in this study, the results to the affected people may be additional pressures and stressors such as exposure to negative attitudes, social expectations not being met, exposure to alcohol and illegal drugs, and social exclusion [19]. In combining these risk factors with their learning difficulties, people with disabilities are likely to also be exposed to vulnerable situations such as to physical, verbal and sexual abuse [22], inadequate social support networks [15] and negative life events and experiences (bullying and frequent losses, such as the death of a parent, loss of a home or loss of formal careers, and repeated perceived failures [6]. To prevent these negative circumstances from happening schools have to adopt different strategies of support. There is now a growing interest in using and applying a range of psychosocial and psychotherapeutic interventions in people with disabilities [7], although this may not be possible where there are no trained professionals or experts in psychological intervention, as in the case of this study. There is also the need to assist parents to provide support for their children at home. As a solution to the problem is the suggestion for social interventions in the form of alleviating poverty, encouraging positive family relationships, promoting acquisition of communicating skills and facilitating access to education. All these are forms of support to people with disabilities to assist them to live meaningful life.

6. Conclusion

Public education and health services, in Nigeria, in regard to people with disabilities, are still very much in their infancy. However, as the country moves towards the desired goals as contained in the government policy documents it is envisaged that more attention and resources would be committed to ensuring equal educational opportunities for all the citizens. Meanwhile, attention will need to be focused on improving teacher pre-service education programmes and or in-service training to incorporate training in the skills of assessment and identification of pupils with special educational needs. Teachers will also need training in knowledge of special educational needs of pupils and how these affect learning, as well as, various strategies for intervention and the provision of support services for pupils with special needs. Building the schools’ capacities for special and inclusive education also goes with improving leadership roles both at governmental and schools’ levels for the delivery of good quality education that can assist pupils with disabilities reach their full potentials and be prepared for the life of contributing meaningfully to their communities’ emancipation and to the economy of their country.

7. References

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Autistic Learners’ Inclusion in the Universal Basic Education Programme in Nigeria

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Abstract

The level of inclusion of children with autism spectrum disorder (ASD) in the implementation of the Universal Basic Education (UBE) programme in Nigeria is the main thrust of this study. It is a truism that education is critical to the development of the human person in particular and by extension the society. Therefore the right of a child to education especially at the basic level is espoused by the United Nations’ 1948 Universal Declaration of Fundamental Human Rights and the world conference on Education for All (EFA) held in Thailand in 1990. In the same token, the belief of Nigeria’s philosophy on education as contained in the National Policy on Education (FGN, 2004) includes the fact that every Nigerian child has a right to equal educational opportunities irrespective of any real or imagined disabilities according to each child’s ability and also that the nation’s education is meant to foster the worth and development of the individual primarily, and the development of the society at large. Ipso facto, denying a child this basic right, on whatever pretext, technically excludes the child from having the opportunity to live a fulfilled and self-actualized life. The Universal Basic Education (UBE) programme in Nigeria as it is now, practically speaking, is for 9 years; made up of 6 years of primary and 3 years of junior secondary education. Primary education is officially for children of about 6 - 11 years who are expected to immediately continue with the junior secondary learning activities. However, after more than a decade of the implementation of the UBE programme in Nigeria, many who are challenged with autism spectrum disorder otherwise called autistic learners seem not to have a recognized well-defined framework by way of their inclusion in the programme. The study was a descriptive survey. The South-South and South-East geographical zones of Nigeria made up of eleven states were sampled using stratified random sampling technique. The numerical strength of the respondents was 342 made up of 33 staff of the states’ UBE boards and 309 head teachers of the basic schools. The instruments for data collection were self-structured questionnaire, interview schedules. Data collected were analyzed using mean and z – test. The study revealed that some states included the autistic learners in their regular schools while others made provisions for them in “special” schools. The private schools for autistic learners received some assistance from the government. This study concluded that the level of inclusion of the autistic learners in the programme was low. Recommendations include that a comprehensive framework should be developed for adequate care of children with autism including the provision of appropriate learning facilities and special skilled teachers.
The Nationalistic Impulse: How Primary and Secondary Schools Reflect the Canadian Indigenous Experience

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Abstract

Indigenous education in primary and secondary schools in Canada has the potential to condition how students understand the Canadian indigenous experience. In many instances, the focus upon indigenous peoples takes advantage of legislative and treaty-based sources of information as a means of developing a cogent framework for such explorations. Developments such as these may lend to the development of a legislative and/or legal perspective of indigenous peoples. As part of a larger study that is, nominally, intended to explore ancestral languages, this presentation will explore narratives on what constitutes adequate explorations and representations of the Canadian indigenous experience have led the researcher to consider the manner in which primary and secondary school teachers explore indigenous peoples and their experiences.

SUMMARY

There may be some rather crucial conceptual distinctions to be made when comparing Kashwentha (the Two-Row Wampum Treaty) and the treaty relationships of elsewhere. Established in 17th century between the Haudenosaunee (Iroquois) peoples and the Dutch settlers of the region [8], Kashwentha codifies sovereignty and nationhood in an assertive manner that avoids the concession of lands or the responsibilities of stewardship [10]. With the use of imagery, narrative and trans-generational consistency of interpretation, Kashwentha provides an illustration of an international accord where the quality of relationships is of principal focus as opposed to transactions involving the ownership/control of territories [1]. It is for this reason that Kashwentha is sometimes boldly affirmed as a treaty that best codifies the sovereignty of the indigenous peoples in question. Kashwentha as a coherent whole represents, in principle, an accord of sharing represented by the two rows of dark wampum against a background of white. These two rows represent the separate, and perhaps unique and distinct, paths that the Onkwehonwe and nonindigenous settlers of this region occupy [9]. The two paths are separate, do not interfere with one another, and do not have pre-established/planned destinies. The significance of this representation is to codify not just sovereignty, but agency as well. Essential to this accord are the principles of peace, respect, and responsibility for our own actions [6].

There may be some who question Kashwentha as a bona fide international accord due to its perceived simplicity and lack of substantiating text. However, many have defended the constitutional importance of Kashwentha as it provides sufficient conceptual reference to the relationships being noted and is fecund in its applicability to contemporary issues. Others might suggest that Kashwentha is important as a precedence-setting accord upon which future treaties were governed such as the Covenant Chain with English settlers in 1677 as well as the Treaty of Canandaigua with America in 1794. In recent times, Kashwentha has been asserted by many indigenous and non-indigenous peoples as an accurate and/or appropriate representation to how relations between treaty peoples should be viewed.

There may be some rather important potential for exploring the multitude of treaty relationships in Canada through the principles of peace, respect and
responsibility that are a constituent part of Kashwentha. Although other treaties in Canada and the historical and contemporary narratives that accompany them have important referents to sovereignty that are relevant to their respective regions, the principles of Kashwentha may be applied differently – this difference may be best understood by seeing treaties through two different lenses: that of legislative/jurisdictional context and that of empathy.

In schools today, rights and legislative devices which codify those rights are explored – including treaties [11. As a part of studies associated with charter rights and citizenship [7], many students explore entitlements and freedoms that focus upon peoples’ responsibilities toward one another and toward their country [4]. Currently, learning about rights and citizenship in schools has included the points of view associated with indigenous peoples [2].

However, many schools in Canada have explored treaty rights through a governing notion of their inherent nature - the alleged inherent nature of First Nations, Metis and Inuit rights is that they are rights based on the notion that the people in question, indigenous peoples, exist at all and have the sort of claim to their respective lands/regions [5]. The inference of this notion in regard to indigenous peoples – that there exists a set of entitlements that are a) held by the individual by virtue of their existence, and b) are, in the Cardinal-esque tradition, unique in so far as they are additional entitlements to those normally associated with Canadian citizenship [3], can govern the developing student perspective on indigenous peoples issues.

These two lines of inquiry, one that focuses upon Canadian citizenship rights and freedoms generally and the other upon those specifically associated with indigenous peoples, can possibly lead to a rather focused perspective on indigenous peoples in Canada. The potential here is that the histories and narratives associated with rights may lead some to see indigenous peoples through a legislative/jurisdictional lens. For instance, the numbered treaties of western and northern Canada, with their focuses upon the cessation of lands and provisions for their surrender, can focus attention to upon the legislative/jurisdictional dimension of these accords. The narrative histories associated with the numbered treaties (e.g., the outside promises of Treaty 1) may also support this focus through the natural examination of reciprocity. Evidence of the existence of this focus may be found in the discussions regarding First Nations issues in Canada that frequently cite Treaty relationships. The very existence of indigenous education as a field that focused upon treaty education also makes the notion of this legislative/jurisdictional focus palpable.

Kahswentha lacks the reciprocal refersents that the numbered treaties bear in abundance. The spirit and intent of Kashwentha was/is to codify a relationship where sharing, respect and harmonious co-existence are governing principles. Although Kahswentha is an accord affiliated with a specific group of Indigenous peoples, it is the spirit and intent of this treaty from which we may learn and apply to contemporary relationships between indigenous and non-indigenous peoples. Although the legislative/jurisdictional dimension is not lacking in the Kashwentha context (after all, the Indian Act as well as current Canadian and American government perspectives and action seem to only respect this dimension), the dimensions of sharing, respect and harmonious co-existence that are associated with Kahswentha may be achieved through recognizing and affirming the empathic potential between indigenous and non-indigenous peoples.

There are many education professionals as well as others who have been and continue to explore the Canadian indigenous experience from more than just legislative/jurisdictional perspectives. In many schools and communities, school programming is being employed in an effort to provide understandings of the Canadian indigenous experience that are connected to literacy, mathematics, ancestral languages, and other areas where focus is given to the individual manifestations of indigenous histories, cultures and traditions. Treaties, legislation, and constitutional rights are and should a constituent part of our developing understanding of indigenous peoples. However, it may be important
that treaties, legislation and rights are not investigated in a manner that leads to an emergent perspective that is principally informed by legislative matters alone. Education professionals must facilitate the emergent field of indigenous education in a way that is responsive to the notion that indigenous content that may be shared, celebrated, and inform the development of a balanced perspective on the Canadian indigenous experience that is appreciative in nature.

References


Session 11: ICT developments and diffusion

Application of ICT in Inculcating Knowledge of Domestic Solid Waste Management
(Author: Pratima Pandit Wagh)

Game Changers: Evaluating Post-Secondary Students’ Computational Thinking in a Video Game Building Class
(Author: Connie Yuen, Ava Solez, Maria Cutumisu)

Raising Awareness for Information Security in a Playful Way
(Authors: Frauke Fuhrmann, Margit Scholl, Denis Edich, Peter Ehrlich, Kai Benjamin, Leiner Lars, Robin Scholl)
Application of ICT in Inculcating Knowledge of Domestic Solid Waste Management

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Abstract

An information communication technology (ICT) significantly assists the acquisition and amalgamation of knowledge, offering developing countries unprecedented opportunities to enhance educational systems. ICTs are influencing all aspects of life, more significantly our environment. To gauge the effectiveness of raising awareness regarding domestic solid waste management (SWM) within the society using computer aided tools (CAL), the present research was carried out. Using CAL, chances of spreading effective environmental awareness would be tremendous. The study was conducted to find knowledge of college students with respect to SWM by using developed communication methods. Sample study was conducted with 50 students. Preliminary data was collected by using questionnaire, before and after employing CAL tool and analyzed by using ‘t’ test.

Development of effective knowledge regarding SWM using multimedia package is guiding factor in this project. The findings suggest that CAL tools were effective in raising knowledge of students regarding SWM.

1. Introduction

The menace of unhealthy disposal of domestic solid waste is one of the important environmental concerns that need to be addressed. Environmental knowledge of the young demographic is crucial as their perception and actions would determine in providing solutions to potential environmental problems, particularly solid waste management. The research is regarding the effectiveness in using multimedia for learning and particularly in distant education method.

This suggests that the results are positive and subjective at the same time. There is discernible enthusiasm among the young generation to learn via new technology. To determine the potency of CAL tools in generating greater awareness, this research was conducted.

2. Literature Review


David Kenneth Berlo stated that communication appears as a regulated process that allows the subject to negotiate with his living environment. Communication becomes, then, a value of power and influence [3].

How effective and efficient is the use of multimedia for learning in lecture and on the Internet? Most results are anecdotal and show positive outcomes, with students being enthusiastic about new methods of learning. Multimedia may be a means to more effective learning, by itself there is no assurance of increased learning. Performance generally improves when the way material is presented is changed [4].

The environmentally sound management of solid wastes issue had received the attention of international and national policy making bodies and citizens. The success of SWM strongly depends on people's behavior [5]. Responsible behavior or changes in waste disposal practices can best be made when people understand the issue.

3. Objectives of the study

In order to conduct this research among the undergraduate students, the investigator has proposed following objectives.
1. To diagnose knowledge of the students about domestic solid waste management.
2. To raise level of knowledge in the target group regarding domestic solid waste management by using computer assisted learning tool developed by investigator.
3. To analyze effectiveness of method on the target group.
4. Tools used

Data collection instrument i.e. tool is developed, which is questionnaire, after formulation of the concept and hypothesis.

Based on reviewed literature, a questionnaire was designed on student’s knowledge about domestic solid waste management [6]. Total 30 questions were included in the questionnaire in order to determine the extent to which students associated with these issues.

Each question in the questionnaire, having four answers, designated as a, b, c and d. The sample scale instrument includes 4-point Likert scale type questions responses that are scored from 1 to 4 and correspond to “1 = disagree”, “2 = neither agree nor disagree”, “3 = agree”, “4 = strongly agree” [7].

The instrument was validated with the assistance of three experts in research and environmental sciences as well as from the Faculty of Education.

5. Variables - Related to problem.

In the present research, the knowledge of survey respondents, regarding solid waste management of domestic waste is variable, which can be changed when experimenter introduces the appropriate knowledge upgrading methods such as by employing computer assisted learning tool developed by investigator.

6. Methodology

6.1. Selection of the sample

Fifty students, doing their graduation in Science, Commerce & Arts, were selected as a target group. Random sampling method used for sample collection. These subjects were from undergraduate colleges in rural as well as from urban areas of the Nasik district of Maharashtra, India.

6.2. Procedure

For data gathering, the questionnaire was handed out as in classroom setting for the students to answer and return (pretest).

After the pretest, to increase knowledge about solid waste management with the help of CAL tool i.e. power point presentation supplemented with pictures, charts, video on impacts of SWM, with an illustrative lecture was delivered. Each and every doubt put forth by the students was resolved on the spot.

After a week a post test was conducted for the same students and by using same questionnaire. Outcomes were recorded as in table 1 and 2. The students responses (pre, post etc) were analyzed by using statistical method based on the significance of the difference between the means of two matched or correlated groups (non independent samples). The t-test for paired samples was used. This implies that each individual observation of one sample has a unique corresponding member in the other sample. This test is used when the samples are dependent; that is, when there is only one sample that has been tested twice (repeated measures) or when there are two samples that have been matched or "paired"[8].

7. Results

Results of pre and post test score of the students are recorded in the tabular form which are as follows.

<table>
<thead>
<tr>
<th>Sr.no</th>
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Table 2. Pre and post test score-observation set

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<table>
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<td>28</td>
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<tr>
<td>50</td>
<td>34</td>
<td>39</td>
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</tbody>
</table>
7.1. Data analysis

The student responses (pre, post etc) were analyzed by using t test. Based on Significance of the difference between the means of two matched or correlated groups (non-independent samples).

**t test**: As these groups are not independent samples, it is necessary to calculate the coefficient of correlation between the pretest and posttest scores of the participants in the experiment.

As the coefficient of correlation is used, the appropriate t test would be based upon given formula as follows:

The number of degrees of freedom (df) would be the number of pairs minus one. Then testing null hypothesis that, “Computer assisted learning tool will not raise the knowledge about domestic solid waste management” By selecting 5 percent level of significance, using a two-tailed test.

Hypothesis testing: Is by using Pearson’s sample correlation coefficient (r) and by using t test outcome of paired t-test recorded in table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable 1</th>
<th>Variable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<td>47.18</td>
</tr>
<tr>
<td>Variance</td>
<td>112.542449</td>
<td>105.701632</td>
</tr>
<tr>
<td>Observations</td>
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<td>50</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.758000128</td>
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</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Df</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>9.683482771</td>
<td></td>
</tr>
<tr>
<td>P(T≤t)</td>
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<td></td>
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<tr>
<td>one-tail</td>
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<tr>
<td>t Critical</td>
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<td></td>
</tr>
<tr>
<td>P(T≤t)</td>
<td>5.79132E-13</td>
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<tr>
<td>two-tail</td>
<td></td>
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<tr>
<td>t Critical</td>
<td>2.009575199</td>
<td></td>
</tr>
<tr>
<td>P(T≤t)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Paired Samples t-test on VAR_1 vs. VAR_2 with 50 Cases (n)
Mean VAR_1: 37.22
Mean VAR_2: 47.18
df: 49
\[ t = 9.683482771 \]
Two tailed test, using data of post and pre test

P-value =5.79132E-13, i.e. p-value: 0.000

Alternative hypothesis: true difference in means is not equal to 0.

![Figure 1. Regression Equation of POST test on PRE test](image)

8. Conclusion

As the t Critical two -tail value of 2.009575199 exceeds t critical value of 9.683482771 for two tailed test at the .05 level for 49 degrees of freedom, we rejected null hypothesis, concluding that initial score of pretest is less than that of final score of posttest of survey respondents, when lecture with power point presentation is delivered. Indicating that, there is increased awareness regarding domestic waste management and related health aspects i.e. significant difference in attitude of students. Secondly researcher concludes that there is considerable difference in student’s knowledge about domestic waste management and related health aspect after learning with the help of strategies developed by investigator.

9. References


1. Introduction

First introduced by constructionist Seymour Papert [1], the term Computational Thinking (CT) was popularized by Jeannette Wing in 2006 as a new literacy encompassing specific critical thinking skills and dispositions used for problem solving in broad disciplines [2]. However, while CT is more readily adopted in science, technology, engineering and mathematics (STEM) education [3], other disciplines have been less inclined to explore the potential of CT for teaching and learning. In part, this resistance is due to the ambiguity of the definition of CT, as researchers have used variable meanings and elements to describe the concept. This research examines pre-service teachers’ CT in a video game building class.

2. Literature Review

A popular definition of computational thinking is “thought processes involved in formulating problems and...solutions [that] are represented in a form...that can be effectively carried out by an information processing agent” [4]. Simultaneously, the International Society for Technology in Education (ISTE) [5] and the Computer Science Teachers’ Association (CSTA) [6] defines computational thinking as “formulating problems in a way that enables...a computer and other tools to help solve them, automating solutions through...a series of [algorithmic] ordered steps...[and] generalizing...this problem solving process to a wide variety of problems”. Other definitions of CT emphasize skills such as logical analyses, decomposition, abstraction, writing algorithms, recognizing patterns, debugging, tinkering, etc. Other significant CT attitudes and dispositions include perseverance, collaboration, or tolerance for ambiguity [7].

In an attempt to make CT more accessible to other disciplines, some researchers have attached extraneous concepts or skills to the definition, proliferating confusion or misconceptions. In education, computing science concepts and CT are generally introduced in piecemeal workshops or teacher conference days, rather than in a systematic, applicable approach that would enable educators to develop critical thinking skills and attitudes through CT [8], [9], [10]. As a result, those outside of computing science are rarely exposed to CT or carry certain preconceptions of what CT encompasses.

3. Methodology

This exploratory study will examine post-secondary students’ common preconceptions and ideas about CT. Specifically, n = 30 students enrolled in a University cross-faculty course on Video Games in Education, will participate in the study. This project-based course aims to provide educators and pre-service teachers with the opportunity to gain hands-on, constructionist experience as video game designers and builders, not simply game consumers. In addition, educators are encouraged to critically evaluate video game use and integration in the education system, and to self-assess personal educational technology competencies, preconceptions of CT. Concomitantly, they will develop 21st century skills, such as creativity, collaboration, communication, problem-solving, and critical thinking as learners in the digital age. Students will sign consent forms and complete both a pre-survey and post-survey following guided CT exercises and game design projects using two visual programming tools, Scratch and Kodu. Results drawn from the pre-survey will be used to examine any prevalent themes. The pre-survey will also be employed to explore the correlations between the students’ prior computing experiences, video game experiences, and educational background at the start of the course, on the openness and perceived applicability (attitudes) of CT in other disciplines and contexts. Then, following the completion of the final course project, the post-survey will be administered and responses will be compared with the pre-survey to assess any changes in the students’ definition of CT.
4. Conclusion

The insights drawn from this study will advance the literature on general preconceptions of computational thinking and educational applications in a variety of disciplines and contexts. Thus, researchers can address the confusion surrounding CT skills and dispositions to make this approach more accessible to other disciplines. The findings will be particularly relevant for university students and will be employed to plan future studies focused on different student populations.

5. Acknowledgements

We would like to express our gratitude to the Faculty of Education (Support for the Advancement of Scholarship Grant # G018000473) and to the University of Alberta (Roger S. Smith Undergraduate Research Award) for their generous support.

6. References


Raising Awareness for Information Security in a Playful Way

Frauke Fuhrmann, Margit Scholl, Denis Edich, Peter Ehrlich, Kai Benjamin, Leiner Lars, Robin Scholl
Technical University of Applied Sciences Wildau, Germany

Abstract

Game-based teaching and learning methods boost motivation and behavior changes [3]. Progressive digitization is increasingly permeating all areas of life. This requires a greater awareness of information security and an improvement of corresponding competences—both in private and working life. Because theft of data and industrial espionage are prevalent in the everyday working lives of organizations it would be beneficial if students as prospective employees were trained in information security. How can students’ awareness for information security be raised and their competences be improved by the use of playful methods? These are the research questions of the work-in-progress research and project that is presented in the following.

1. Introduction

Today, information technology (IT) affects almost all areas of life. However, while most people are able to use the new technologies, they are often not aware of the steadily growing possibilities of their abuse that accompanies their increasing distribution and complexity. Therefore, a thorough awareness and understanding of the inherent risks of all-embracing digitization is necessary in private as well as working life. The issue of information and IT security has both a technical and a human side. However, the best technical solutions to protect IT infrastructures and sensitive information are ineffectual if people are not aware of the importance and means of protecting confidential information or do not comply with existing regulations. Studies show that employees unconsciously and consciously cause the majority of information security incidents [1].

2. Research Background

A lack of awareness of information security and the corresponding lack of compliance with regulations may originate, among others, in ineffective awareness-raising measures. Studies reveal that often applied awareness and training measures such as awareness campaigns (e.g., flyers, posters, films), web-based training or the presentation of information without interaction possibilities do not lead to a lasting security awareness and to the kind of knowledge processing that is needed in order to comply with security guidelines [2]. Rather, training measures that provide room for personal communication and interaction are recommended for the promotion of awareness and behavioral changes [2].

Game-based learning is increasingly receiving considerable recognition as an effective teaching and learning method that improves motivation and triggers behavioral changes [3]. Games enable active and experienced-oriented learning by trial and error, repetition, and by giving the opportunity to learn from failures. The player is placed in a problem situation in which he/she learns directly because feedback on the learning progress is provided immediately. The user learns the effects of his/her actions and what he/she must work on to progress and succeed. Games enable learner-centered learning that takes into account the user’s level of knowledge and his/her individual needs [4]. With this in mind, game-based teaching and learning methods should be a suitable instrument to promote awareness of information security and to improve corresponding knowledge. However, empirical evidence of game-based learning is to date rare [5].

3. The Project SecAware4job

Sensitization for information security and acquiring knowledge of how to protect confidential data cannot start soon enough. Therefore, a current research project at the Technical University of Applied Sciences Wildau - Information Security Awareness for Young Professionals: SecAwar4job, sponsored by the Horst Görtz Foundation - examines the following research questions: How can students’ awareness of information security be raised and how can their competences be improved by the use of playful methods?

In order to answer these research questions several game-based methods are developed and evaluated in the research project. The developed game-based methods are applied and tested especially in classes on Sensitization for Information Security in non-technical degree courses. Multiple

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learning tools such as theoretical information, a handbook, exchange of experiences, discussions, interesting tasks etc. accompany the gaming elements [2, 5]. This innovative mix of methods should help students to understand this abstract and complex theme with all its facets (regulatory framework, norms and standards, protective measures, etc.) more easily and make the topic tangible and open to their direct experience.

4. Examples of Developed Methods

In the following, a learning unit and an interactive mobile exercise are described that have been developed and are applied in SecAware4job and that use elements of game-based learning such as cooperative learning in teams, rewards in form of game points to promote motivation and immediate feedback into the learning progress in order to improve learning success [6, 7].

A learning unit about the criminal code was developed according to the didactic and methodological approach of help for self-education. The learning topic should be made understandable and specific in such a way that the learning is possible without profound prior knowledge. Furthermore, the learning unit should include many communicative and playful elements in order to motivate learners to take an interest in this difficult topic. At the beginning, students are asked to estimate blackened values of statistics regarding the topic cybercrime. This gives students insight into current data and the dimensions of cyber attacks. Afterwards, students receive topical cases and discuss in teams which articles of the penal code have been breached. The solutions are shared and discussed in the whole course, too. At the end, sample solutions are presented to provide the students with immediate feedback. To enhance repetition and retention, students have the opportunity to solve riddles in which key words from the relevant articles must be found. Sample solutions are provided, too.

A mobile and web-based application on “phishing” contains a brief theoretical introduction and two exercises in the form of a quiz. In the first one, the user has to find out if the displayed e-mails are phishing attempts or not. This first exercise does not differ from other existing mobile phishing tests (for example: http://www.it.tum.de/it-sicherheit/glossar/phishing-mails/selbstlernetest-phishing). But in contrast to them, in the second quiz, the user has to identify the characteristics in the e-mails that indicate a phishing attempt. For each correct answer or identified characteristic the student receives 1 point - this kind of reward system promotes motivation and can be used in a competition. After the completion of each quiz the user has the opportunity to review all the questions and see the right answers. This enables direct feedback and improves the learning success.

5. Conclusion

Because the presented research project has not yet been completed and the developed and explained methods have to date only been evaluated by a small number of students, we are not able to draw generally valid conclusions. However, our research will be continued with other student groups and the developments will continue to be reviewed. So far, we can conclude that those students who already took part in the class and experienced the methods were very satisfied and praised the applied innovative and interactive mix of methods.

6. References


Session 12: Learning / Teaching Methodologies and Assessment

The Preparation of Secondary School Mathematics Teachers: The Effect of a Content Gap Course on Prospective Teachers’ Subject Content Knowledge: A South African Perspective
(Author: Alex, J.K.)

Formative Assessment in Religious Education: What to Assess?
(Author: Sufina Khan)

Moving Toward a New Paradigm of In-service Education in the Dominican Republic (DR)
(Author: Elena A. Dominguez C.)
The Preparation of Secondary School Mathematics Teachers: The Effect of a Content Gap Course on Prospective Teachers’ Subject Content Knowledge: A South African Perspective

Alex, J.K.
Walter Sisulu University, South Africa

Abstract

This extended abstract reports on the effect of a Content Gap Course on the Subject Content Knowledge (SCK) of a sample of 40 third year mathematics education students on selected topics in the senior secondary school mathematics curriculum of South Africa. The theoretical framework rests on theories on SCK of pre-service teachers. The research followed a positivist paradigm and pre-experimental design. Two tests on the selected topics before and after the Content Gap Course provided the data for the study. It was found that the prospective teachers had only limited SCK due to the curriculum constraints and that the Content Gap Course had a positive effect. This study recommends that acquiring the SCK is important for the students’ success as emerging teachers and effective teaching measures and changes in the teacher training curriculum of the university can be used as tools to enhance the preparation of prospective teachers of the country.

1. Introduction

South African education system has focused a great deal of time and attention on teacher preparation in the recent years. Teachers’ content knowledge has a significant influence on student learning and academic success. South African government attaches a great deal of importance to the learning and teaching of mathematics in its school system due to its significant role in nation building. Teachers’ mathematics content knowledge makes a difference in their instructional practice and their students’ achievement. Wilburne and Long [1] argue that many pre-service teachers find that they never had an opportunity to really study the middle or high school mathematics curriculum in depth, yet are expected to know the secondary mathematics content and be expected to teach it with meaning in their student teaching and beginning teaching experiences. According to Bukova-Güzel et al. [2], content specific knowledge domains for mathematics teachers can be named as mathematics subject-matter knowledge, mathematics curriculum knowledge and mathematical pedagogical content knowledge.

Teaching strategies, content knowledge, understanding and motivation were some of the factors identified by Mji and Makgato [3] on their study on the factors associated with the poor performance of South African learners in mathematics and physical sciences and they suggest that learners can be motivated towards the subject if educators are confident with respect to knowledge of the subjects they teach. It is also noted that preparing teachers to teach mathematics effectively is one of the most urgent problems facing those who wish to improve students’ learning [4]. Kriek and Grayson [5] also assert that the poor state of mathematics and science education in South Africa can be attributed, in part, to many teachers’ limited content knowledge, ineffective teaching approaches and unprofessional attitudes.

2. Research Rationale

Research conducted mainly in the eastern parts of Eastern Cape (e.g., [6]; [7]) also inferred that the general poor quality of teachers and teaching are some of the factors that have contributed to the lacking in the necessary mathematical knowledge of disadvantaged learners from the impoverished learning environments and it is imperative to find solutions that will improve the quality of mathematics learning and teaching, especially in the rural part of the province. This study is significant as the researcher felt that being a teacher trainer, the SCK of the mathematics education students to be checked and corrected. The research question addressed in this paper is: Can a Content Gap Course on prospective teachers improve their SCK on selected topics?

3. Methods

This research adopted a positivist paradigm, pre-experimental design (one group pre-test post-test design) and a quantitative approach. The sample consisted of a group of third year university Bachelor of Education (Mathematics Education) cohort of 40 students of a South African Comprehensive Public University. All the ethical requirements were met.
Two question papers which were purposively selected from a standardised question paper of Matric Examination of 2014 of which, one consisting of seven questions on Financial Mathematics and Probability (Paper 1) and the other one consisting of 10 questions on Data Handling, Analytical Geometry, Trigonometry and Euclidean Geometry (Paper 2) provided the data for the SCK for the study. From the analysis of the pre-test it was found that the total mean percentage was 27% and that the prospective teachers had only limited SCK on the topics that they were meant to teach in the schools during their School Based Experience.

After seeing the performance of the students in the test, it was agreed that a Content Gap Course can be arranged to address the low performance in certain topics. The classes were offered after the normal lecturing hours of the students. Due to the constraints of time and the demand of the topics, classes were conducted for 8 weeks only for Financial Mathematics, Probability, Data Handling and Euclidean geometry. Analytical Geometry and Trigonometry were not included in the content gap course as the students deemed it as more manageable than the other demanding topics.

4. Findings

The scripts were marked according to the memorandum and were further analysed using Microsoft Excel 2013. The following table shows the performance of the students before and after the Content Gap Course.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Pre-test (Mean %)</th>
<th>Post-test (Mean %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Maths</td>
<td>37</td>
<td>52</td>
</tr>
<tr>
<td>Probability</td>
<td>18</td>
<td>34</td>
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<td>Data Handling</td>
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<td>Analytical Geometry</td>
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<td>43</td>
</tr>
<tr>
<td>Total Paper 2</td>
<td>27</td>
<td>31</td>
</tr>
</tbody>
</table>

From Table 1, it is noted that the average percentages for Financial Mathematics increased from 37% to 52%, Probability increased from 18% to 34%, Data Handling increased from 35% to 40%, Analytical geometry increased from 37% to 45%, Euclidean Geometry increased from 16% to 20% and a decrease in Trigonometry was noted from 28% to 27%, and the total percentages for Paper 1 and Paper 2 separately increased from 27% to 43% and 31% respectively. It is also noted from the analysis that the average percentages for Financial Mathematics and Probability were considerably increased and the performance in Trigonometry was lower than the percentage of the pre-test. The analysis showed that the Content Gap Course had a positive effect in the topics that were very new to the students namely Financial Mathematics, Geometry and Probability.

A close examination on the content of the modules taught for the mathematics education was needed, as most of the students complained that the content needed in the school was lacking in their curriculum. It was done through document analysis. It was noted from the course modules that the mathematics content curriculum followed in the senior secondary schools was not stressed in the modules. Even though in the first year of study, senior secondary school mathematics was the content for their course modules, the students were not taught with the topics of Geometry and Probability as they were following a different curriculum at that time and during their third year of study, they had to teach the topics in schools as these topics were part of the new curriculum, which was not catered for in their modules.

5. Conclusions

It is noted that the prospective teachers had only limited subject content knowledge (SCK) on the topics that they were meant to teach in the schools of which some of the topics were not even included in the university’s teacher education curriculum. They also experienced the same difficulties as the matric students of 2014 as explained by the Chief Examiner’s Report of 2014 [8]. The Content Gap Course had a positive effect in topics that are very new to the prospective teachers which are mainly Financial Mathematics and Probability. Analytical Geometry was fairly attempted even though it was not taught during the Content Gap Course. Trigonometry was not taught during the Content Gap Course and there was a slight decline in the performance. The performance in Euclidean geometry has a slight improvement and it still remained as the worst performing topic even after the Content Gap Course.
6. Recommendations

It is recommended that the curriculum of the university should include more opportunities for the Mathematics Education students to familiarise them with the school mathematics content. Acquiring the subject content knowledge is important for the students’ success as emerging teachers and effective teaching measures and changes in the teacher training curriculum of the university can be used as tools to enhance the preparation of future teachers of the country.

7. References


Formative Assessment in Religious Education: What to Assess?

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Abstract

Formative assessment supports student learning. However, assessment in religious education is challenging. One reason for this challenge could be that the students may be used to the summative model of assessment. Also, students learn about abstract terms and multiple interpretations in RE. This paper explores the concept of educational assessment and that of formative assessment in particular. It also critically analyses the role of formative assessment in religious education to maximize the learning outcomes for students.

1. Introduction

Summative exams may motivate some students to be attentive throughout the year, take notes, keep them complete and memorize everything so that they could get good grades in the exams at the end of each year. On the other hand, some students may experience apprehension because of the need to score better than their classmates. Therefore, student motivation could range from preparing well for exams to performing better than their friends. Summative assessment (SA) might be effective to grade students according to their performance; however it might become difficult for a teacher to gauge the amount of content the students’ have learnt and what they have actually internalized. Both the summative and the formative assessment have their own strengths and challenges. Formative assessment might be viewed as a process for both, the teacher and the students’ which helps in supporting the learning of the students and makes the teacher aware of the students understanding of the concepts learnt by them.

One of the aims of religious education is to understand and respect the ‘different religions, beliefs, values and traditions (including ethical life stances), and their influence on individuals, societies, communities and cultures’ [14]. At the same time, the students learn about abstract terms [4] or multiple interpretations related to religion [14] in the RE classes and assessing these might become a challenge. The research was based on the rationale that though assessment is difficult in religious education, it is an essential and helpful practice which allows both, the students’ and the teacher to understand where they are placed in the light of the curriculum content.

2. What is Educational Assessment?

Brown [6] defines assessment as ‘probably the most important thing we can do to help our students learn.’ Brown affirmatively implies that assessment is central to the process of learning. He also explains that the teachers need to keep the ‘what, why and how in mind while designing an assessment strategy for the students’ [6]. Boud and Falchikov [5] claim that assessment affects the future decisions of the students about their careers. This implies that sometimes assessment may be seen as a product rather than a process which influences the students’ future in the form of a certificate or mark sheet that is needed for a job or for an admission in a university. These two views explain how assessment process is either perceived as being helpful to support students learning or as an obligation towards obtaining a qualification.

Berry and Adamson [2] explain that assessment is a sensitive and debated term having a variety of impacts on different people. They state that assessment could create ‘anxiety, pressure, competition, success, failure, judgment, feedback, fairness, standards, accountability, bureaucracy and drudgery, to mention but a few’ impacts on the students. This might explain that though assessment may be an important tool to help the students learn, different students have different experiences with being assessed which may impact their learning outcomes and their performance on a task. This is one of the reasons why assessment has gained importance in school practices and also in the process of educational policy formulations by the government.

Assessment helps the teachers to understand whether the students have understood the taught concepts or need more attention and time in order to understand them.
The role of a teacher also becomes important in supporting and enhancing the learning of the students on the basis of the results achieved from the conducted assessment. ‘Learning is driven by what teachers and pupils do in classrooms’ [3] and ‘learning is regarded as an active process and is a personal interpretation of the world’ [2]. Therefore, learning is a complex maze of interaction where both, the teacher and students’ are active in the process of coding and decoding of the information planned for the day. Their learning outcomes are based on their personal experiences. Every student might decode the taught information based on his/her intelligence and abilities and their performance helps the teacher to plan the further action.

The Task Group on Assessment and Testing (TGAT) chaired by Paul Black devised four purposes of assessment. These are formative, summative, diagnostic and evaluative [2], [12]. However, the two main purposes of assessment are making judgments about the performance or about the effectiveness of the system and improving the learning of the students [2]. Educational assessment can be distinguished as summative or assessment of learning and formative or assessment for learning as adopted by Assessment Reform Group (ARG) in order to avoid ‘misinterpretation and confusion’ and make the terms less technical [2], [12]. The nature of formative assessment has been discussed below.

2.1. What is Formative Assessment?

Black and William [3] define assessment as all the activities undertaken by the teacher and the students. These activities help to provide information which could be used as feedback to amend the teaching and learning if required. They further add that this assessment could become formative in nature when the evidences or the feedbacks are incorporated in the teaching and learning process to meet the needs of the students and the teachers. Black and William compared a classroom to a black box and attempted to understand what happens inside this black box during the teaching and learning process as opposed to seeing what is introduced to this box from outside and the output incurred due to the introduction of the outside variable. According to them, formative assessment ‘is at the heart of effective teaching’ [3] and hence it might be important to see how it takes place in a classroom.

Hall and Burke [10] draw on Cowie and Bell’s [8] distinction of ‘two types of formative assessment methods which are planned formative assessment and interactive formative assessment. Planned formative assessment is semiformal in nature and may take place in the beginning or end of the topic through an activity. The purpose of this form of assessment is to enhance the learning and teaching. On the other hand, the interactive formative assessment is ongoing in nature and takes place during the teacher-pupil interaction. In this form of assessment, the learning is enhanced through the intervention or mediation of the teacher in the pupil’s learning. The diagrammatical representation of the two methods of Cowie and Bell [8] is shown in Figure 1 and Figure 2 below.

![Figure 1. Planned Formative Assessment](image1)

![Figure 2. Interactive Formative Assessment](image2)
Formative assessment is not planned or anticipated and encourages learning through interaction. The second difference between both is that in planned formative assessment there is a longer time gap in giving the feedback to the students as compared to the interactive formative assessment [10]. The second difference could be true as in the case of interactive assessment the purpose of the assessment is to improve the learning of the students by mediating or intervening in the ongoing learning process of the students.

Yorke [16] maintains that Cowie and Bell’s model follows three steps – observation of the students by the teacher, interpreting their action by the teacher and acting on the students response by the teacher. Therefore, Yorke [16] claims that this model is teacher-oriented in nature. However, the definition of formative assessment which Cowie and Bell used for their research is that assessment is a ‘process used by teachers and students to recognise and respond to student learning in order to enhance that learning, during the learning’ [8]. They claim that the process of formative assessment includes responding to the students learning with the main objective of improving or enhancing the learning outcomes which may also make their model student-oriented in nature.

2.2. Formative Assessment in Religious Education: What to Assess?

John White [14] explains the aims of religious education according to Qualifications and Curriculum Authority (QCA), London (2000). Some of these aims are mentioned below:

- encouraging ‘pupils to consider questions of meaning and purpose in life,’
- understanding and respecting ‘different religions, beliefs, values and traditions (including ethical life stances), and their influence on individuals, societies, communities and cultures,’
- developing ‘sense of identity and belonging,’ and encouraging the students ‘to reflect on, analyse and evaluate their beliefs, values and practices and communicate their responses.’ Therefore assessment in RE might include assessment of how the students develop different perspectives, develop deep and insightful thinking about origin of life, come to accept the moral and ethical values and develop a sense of identity.

These learning outcomes might be at times difficult to assess within the boundaries of a classroom. Therefore in my understanding the black box model of assessment proposed by Black and William might help a teacher to understand the progress of the students’ in a classroom. However, it might provide limited indications about whether the students apply these learning outcomes in their real life experiences outside the classroom and whether they are able to internalize the concepts learnt in the classroom.

Block [4] in his book Pedagogy, Religion and Practice notes that educational authorities value assessment more than deeds and questions the dependability on assessment to measure variables like holiness and deeds. He himself reflects on his experiences of grading and marking the students and looks for answers in non-Western philosophy of teaching and learning. He suggests that if the character of the students is to be valued as opposed to the grades the process of assessment might become unending and immeasurable. He also suggests that student portfolios could be used for this but it would reflect only a process of the students and not a product [4].

However, I believe that maintaining portfolios could be an effective method of recording and assessing the students learning as not everything taught in a particular class may be completely understood by all the students on the same day, during the same class. Due to this, an extended record might be beneficial. Sometimes a particular objective may make meaning to the students later in life when they may come across it in practical life instead of being taught in the class i.e. theoretically. For example, some values like tolerance, citizenship, community service and respect towards one’s own community and towards other faith could be reflected outside the walls of the classroom. Because of the nature of religious values, assessment in RE might need flexibility and persistence to at least gauge the progress of the students consistently. It needs be an ongoing process and not everything learnt in the class might be within the framework of assessment.

Expeciting the students to be masters of the concepts immediately might therefore be an unreasonable expectation by the teacher. Hence, teaching and assessment is a ‘deliberate exercise of principled judgment in the light of rational knowledge and understanding’ [7]. ‘Elazar suggests that arrest is appropriate; in schools, the death sentence arrives in the form of grades’ and that ‘as study is interminable, there is never a moment when grades are appropriate; the wise refrain from completion’ [4]. Hence, it may help the teacher to be flexible and not always bind themselves by the standards of the curriculum. This is also asserted by Block [4] who states that ‘what is learned in school rarely has any immediate relevance outside the requirements of the assessment tools of the educator.’

3. Reflection

Conducting planned formative assessment provides time to a teacher to plan few aspects of assessment.
For example, it allows the teacher to decide about the difficulty level which needs to be set for the students, it allows the teacher to plan the way feedback would be shared and it gives time to a teacher to plan the nature of assessment to be conducted. Planned formative assessment also makes the assessment objectives and the learning outcomes clear for both, the teacher and the students. For example, when I planned to conduct the group activity, group quiz or rally robin, I informed the students about the nature of assessment, the time and the day the assessment would be conducted and also the units/chapters which they would be required to prepare. This gave time to the students to prepare for assessment as well.

In a way this kind of a planning might seem teacher oriented (Yorke, 2003: 486) as it may seem to appear as per the planning of the teacher, however, it is essentially focused to gain knowledge about the students’ learning [8]. Therefore, I learnt that planned formative assessment provides almost equal time for preparation to both, the teacher and the students. Also, being prepared for being assessed might also increase the confidence levels of the students.

It is also interesting to note that sometimes a teacher might plan the formative assessment on the basis of the interaction he/she has with the students. For example, during my interaction with the students, I would observe the students reaction to a particular content being taught and if they would seem less interested or bored, I would plan to assess them on that content in the following class. I would do this to see if they remember the content from that class. Also, informing them that they should listen actively as they would be assessed later would make them more alert.

This means that sometimes a planned formative assessment might stem from an interactive model of Cowie and Bell when a teacher notices, recognizes and responds to pupils thoughts instead of eliciting a response through an activity, interpreting it and then acting on it which is the process of a planned formative assessment [10]. It could also be possible that planned formative assessment could include an ongoing interactive feedback not only planned formative feedback. For example, once during a planned group activity of making a presentation, I recognized that a particular group was not being productive and was very slow in the task assigned to them. Though the activity was planned beforehand, I responded by planning to share an immediate feedback with the students' about their non-performance on a task and reminded them about the assessment objectives.

Another important reflection is that during the assessment process no two activities should be/ could be compared with each other. This is because every activity has its own objectives and aims and brings different outcomes. Assessment process is like an experiment – you set out to attempt to fulfill an objective but with it you might come to know about few other things too. This continuous process would help a teacher to know about the students and their abilities in a better informed way. Therefore there could be no comparison between two activities of assessment. One could use them as a unit and can also look at them as a scheme to get an idea about the overall performance of the students. Also, it is safe to ask the students what they like or enjoy and what they find challenging.

4. Conclusion

Assessment appears to be an integral part of the role of a teacher which is performed with the fundamental objective of enhancing the students’ learning as explained by Hall and Burke [10]. Also, considering the objectives and the nature of the content imparted in RE, it is important for the RE teachers to be reflective about their assessment practices in classrooms. Therefore, a teacher could play an important role in enhancing the students learning by being proactive about the methods he/she uses to assess the student learning. It is also important to note how the two types of formative assessments work in a classroom, the impacts these strategies have on both the teacher and the students and the impact that a student – teacher interaction and the teacher’s awareness about the students behaviors and responses can have on the teacher’s decision to assess the students and share feedback with them.

A teacher’s content knowledge might become strong when he/she uses the planned formative assessment because of the time available to plan the assessment activity. However, already having a strong hold over the content knowledge of the curriculum becomes even more important for the teacher as there might be a possibility of a teacher using an interactive formative assessment without intentionally planning it beforehand. Also, a teacher might continuously use interactive formative assessment methods on the basis of the value of teacher – pupil interactions in the classroom in order to continuously gauge the students understanding of the content. This value is given to the interactions based on the teacher’s judgment.

5. References


Moving Toward a New Paradigm of In-service Education in the Dominican Republic (DR)

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Abstract

The Dominican educational system has conventionally adopted fragmented and decontextualized workshops delivered by external entities as its in-service teacher education model. Although teachers are required to participate in those traditional modules annually, international reviews of the Dominican educational system show that traditional teacher professional development (TPD) workshops have not improved teaching and learning in the Dominican context [3][8]. Moreover, research more broadly indicates that traditional TPD is an ineffective vehicle to promote teachers’ learning and professional improvement [14][33]. However, a growing body of TPD research directly links teacher professional growth and continual learning to collaborative activities that occur in the classroom and school context [4][19]. This paper examines how the Dominican Ministry of Education (MINERD) frames TPD, and how this conception reinforces teachers’ professional status quo. It argues that MINERD should restructure the current TPD model to incorporate the teacher Community of Learning framework. This approach promotes teachers’ continual learning by encouraging the performance of professional activities responsive to everyday, culturally situated classroom and school realities.

1. Introduction

For two decades, Dominican educational reformers have made a commitment to offer pre-service education to Dominican teachers [8][24][32]. Less effort, however, has been dedicated to building well-designed in-service teacher education [24][32]. In this paper, I put forward the idea that many pre-service education programs inadequately connect theory and practice, building from the work of scholars like Korthagen et al. [11]; and argue that pre-service education programs do not sufficiently equip teachers with the necessary knowledge and skills to support them throughout their career [5][18]. Since the 1990s, research on teaching has increasingly focused on the impact of Teacher Professional Development (TPD) on teaching and students’ learning process [27]. Findings indicate that well-designed TPD improves teaching quality, helps teachers to design effective learning experiences [9] and bridges the gap between theory and practice in pre-service education programs [2].

While it is understood that professional development plays a pivotal role in enhancing the quality of teaching and teachers’ professional growth, the Dominican Republic Ministry of Education (MINERD) has assumed an educational in-service model that yields unsuccessful results [24][25]. By overlooking how teachers learn during their career and the important role of effective TPD on teacher improvement, MINERD perpetuates a depressed quality of teaching and learning. Hence, this paper will highlight the need for change in Dominican in-service education, which is defined here as the traditional model of off-site, fragmented workshops facilitated by external entities. It proposes Communities of Learning (CLs) as a potential solution, whereby Dominican teachers engage in a school-based, systematic, and autonomous educational process to optimize their instruction.

This literature review is structured to address the following questions:

1. What are the characteristics of traditional TPD in the DR?
2. What are the implications and effects of traditional teacher professional development in the DR as informed by broad review of the literature?
3. How might a Community of Learning (CL) perspective improve teacher in-service learning in the Dominican public sector based on teacher professional development research?

In examining the influence of the traditional TPD approach on teachers’ professional learning, it is my objective to ignite a dialogue about its negative effects. I argue that measures taken by MINERD regarding teacher in-service education are unfruitful and hinder professional growth [1][24][32]. For instance, Dominican public schoolteachers perceive discouragement and lack of engagement with their profession, in part as result of the neglectful attitude of educational authorities toward sustaining an
ineffective TPD model throughout the years [24]. I also highlight the potential role of MINERD in considering the Community of Learning paradigm as a potential approach that challenges the effects of the existing TPD and enacts authentic professional growth in teachers [19][28][33].

Throughout this paper, I develop my contention using the research on TPD and the international reviews of the DR educational system. I establish a link between the accounts of these publications about Dominican teacher professional development and the research findings concerning the model of TPD adopted by the DR. Finally, I draw from research on TPD to recommend that MINERD consider enacting school-based Communities of Learning.

2. The Teaching Profession in the Dominican Republic (DR)

The DR, like many countries in Latin America, faces substantial challenges in providing teacher education that ensures high quality instruction [3]. In the DR, there are approximately 67,000 teachers, 74% of whom work for the public sector [3][24][25]. Moreover, in the DR, the teaching profession lacks a strong reputation and social esteem because of underpayment relative to other professions and the commonly adverse working conditions. For example, public education teachers might work under inadequate infrastructure, with lack of resources and overpopulated classrooms, and without effective preparation and induction [7][24]. Regardless of these unfavorable conditions, there is still a vast population of young people, most from rural areas, who become teachers. A high percentage of these candidates choose the profession, not by vocation, but because it guarantees a permanent job and enticing benefits (e.g., retirement pension, teachers union, promotion by seniority), which for many of these candidates represents the only vehicle to progress from their low-income social background [24]. As a result, the professional image of teachers is commonly portrayed by the particular conditions mentioned above and is perceived as extremely weak.

Along with the disadvantageous conditions and lack of social acceptance of the teaching profession, the two universities with the highest enrollment to prepare public teachers (UASD and ISFODOSU) have inexpensive tuition, lack rigorous admission processes, and are characterized by deficient programs and insufficiently qualified professors [7][24][32]. This promotes the registration of candidates who possess a weak motivation for the profession and results in these universities functioning with an “open door” for whomever chooses to become a teacher [1][25]. In summary, teaching has become an extraordinary opportunity for many to get a degree, which leads to better opportunities for many Dominicans with a low educational and cultural level [24][32]. Hence, these universities continue to perpetuate the low quality education that prevails in the DR.

The DR’s public schools mirror the educational teaching force problems and social background described above. Approximately 50% of the teachers have less than five years of work experience [24]; in a public school context, few teachers have the knowledge of content and practice that is a requisite in current measures of teacher quality [24][32]. There is a the lack of opportunities for teachers to advance within the profession; currently, teachers need only five years of well-reputed teaching to apply for managerial positions outside of education with better salaries and opportunities for decision-making [24][25][32]. This rotation of inexperienced teachers in the Dominican classrooms promotes an unstable environment in the schools and induces the best educational and household backgrounds— to seek career development outside the classroom [1][32]. As a result, there is a shortage of qualified teachers in the classroom, leaving schools with a majority of novice teachers or teachers who are focused on obtaining their pensions through seniority [1].

A key trait of the Dominican public school system is that teachers are usually hired by shifts, an arrangement where classes occur in the morning, afternoon, and occasionally in the night. Originally, this system was established as part of a solution to the deficit of classrooms and teachers [21][24]. In order to acquire an acceptable salary, teachers commonly worked two shifts [22]. As result, there was (a) a decrease of the legally constituted school schedule due to teachers and students mobility, (b) an overuse of school resources and infrastructure [24][22], and (c) teacher weariness from teaching more than one group of students [21]. These undesirable consequences of the shift system, in conjunction with teachers’ poor salaries, provoked the MINERD in its second Ten Year Plan: 2008-2018 to include the construction of classrooms and call for the abolishment the shift system, ultimately launching a full-time schedule with higher wedges for public teachers. During the last 5 years, MINERD has been progressively moving toward this goal and in the academic year 2013-2014, MINERD reported that 96 pilot schools have adopted the new full-time schedule, thereby benefiting approximately 33,000 students [21][12]. This new policy of a full time schedule is significant when considering meaningful professional activities that could improve the quality of Dominican teachers, which I will develop later in this paper.

In the last five years, there has been an increasing dialogue among institutions in charge of teacher education, MINERD, and the Teacher Union. The
objective of these conversations has been the adoption of new measures to improve the quality of teachers and promote teaching as an attractive professional career [23]. As result of this continued effort to increase the quality of teachers, MINERD, with the support of local and international organizations, also (a) developed new standards for teacher education and teachers’ professional profile, and (b) established a new system of teacher evaluation based on competencies [23], [25]. In addition, 2012 saw the development of a national plan of teacher reform with the aim of strengthening the teaching profession [3], [34] through “designing an admission process to improve the quality of teacher candidates, elaborating a national plan to better educate teacher educators, accrediting teacher programs, establishing mentorship, and developing research on teacher education” [3]. Although there is this strong blueprint to develop quality pre-service education, there is still a lack of dialogue regarding teacher professional development [3].

Some Latin American countries - including Chile, Mexico, Brazil, and Costa Rica, which experienced a similar teaching profession context to the DR - have improved their teaching and students’ learning by prioritizing effective TPD [2]. Looking at the data from these countries suggests that MINERD’s current plan for teacher improvement, while well intentioned, could be seen as deficient because it overlooks the research on effective TPD, specifically teachers expanding their knowledge through a constant process of professional development based on classroom context [6], [10], [14], [16], [19], [33].

In this section, I have discussed the less than desirable image of the teaching profession in the DR, the motivational factors at play in becoming a teacher, the social and cultural background of teacher candidates, and the role of some public universities in providing low-quality education to many of the Dominican teacher candidates. I have also highlighted some of the challenges the DR faces regarding the profession, including improving the overall quality of teaching and reducing the high attrition of experienced and qualified teachers within the school classroom. I have indicated that the current endeavors of the DR to improve pre-service teacher education could result in deficient measures, because there is a lack of dialogue to develop effective TPD. Indeed, I have put forward that effective teacher professional development is a potential vehicle to achieve quality in teaching and learning in the DR. As mentioned previously, the role of TPD is an extremely important piece of any discussion concerning teacher education, and will be further developed in the next section of this paper with a focus on TPD in the DR.

3. Implications and Effects of Traditional Workshops

The DR established a system of professional workshops delivered by private institutions (e.g. universities, international organizations) within the framework of the educational reform Ten Year Plan: 1992-2002 with the goal of improving teaching quality [24]. In addition to these trainings, another major policy implementation was the creation of the National Institute of Teacher Education and Training (INAFOCAM): a decentralized institution, in 2001, with one of its main functions being to regulate and provide in-service education nationwide [24], [25]. However, INAFOCAM function has been limited to managing the recruitment of workshop facilitators, and supporting and following up on the professional programs designed by the other institutes [24]. Therefore, in the DR, the prevailing system has evolved in such a way that local and international organizations coordinate, provide, and fund numerous off-site in-service workshops for the public teachers [7], [24], [25].

Although the funding and support of external entities may seem like a significant help to the educational system, reports on Dominican in-service training show that TPD has been deficient in a number of ways: (a) it has not improved teaching and learning; (b) it has not supported the consideration of diversity among educators and in school contexts; (c) it has provided insufficient articulation between the pre-service education and the content disseminated in workshops; and (d) there seems to be a lack of coherence between the course content and school conditions to support delivering teaching methods and learning models [1]. The failure of these in-service trainings is typically attributed to: (a) low-quality pre-service education [3], [25], [31]; (b) a lack of strong policy for in-service education; and (c) inconsistent evaluation of the professional workshops [24]. However, in my view, another potential cause could be that MINERD authorities are overlooking the ways in which teachers learn and develop and, in the process, failing to create a fruitful model of systematic professional learning. Consequently, these trainings have fell short in meeting their objective of enacting teachers’ learning and improving the quality of the Dominican educational system.

These negative findings regarding the workshops that have been developed in the Dominican context should come as no surprise, as they generally adhere to the traditional TPD model. Research shows that traditional TPD - which consists of fragmented, off-site workshops delivered by individuals who are not related to the school contexts - is not an adequate tool to improve teaching [16], [14], [33]. While older research tended to assume that professional development workshops were an effective tool for
improving the quality of teaching and learning, a new body of research shows that teachers learn better when they participate in ongoing formation through shared practice connected to their specific cultural and pedagogical context [14], [16], [19]. Therefore, I argue current TPD practices, based on the aforementioned traditional TPD model, reinforce Dominican teachers’ professional status quo.

4. Communities of Learning (CLs)

As discussed in the previous section, traditional in-service education workshops - the current TPD structure sustained by MINERD for more than two decades - are not recommended for enhancing teacher professional growth [26], [14]. Instead, research on teaching has increasingly discussed how Communities of Learning (CLs), “ongoing groups of teachers ... who meet regularly for the purposes of increasing their own learning and that of their students” [13, p.2], offer an effective alternative for enacting professional growth by promoting collaboration among colleagues and contextualized learning opportunities [4], [6], [10], [14], [16], [19], [28], [33].

Another feature of a CL is the community leader, who is charged with supporting his or her colleagues in this educational venture. In discussions regarding a CL leader, some scholars refer to the principal as the leader of a CL [4]. Other academics, however, show that teachers’ unwillingness to assume leadership roles is sometimes caused by the prevailing “bureaucratic” and “hierarchical” structure of the school system [15, p.10]; thus, many teachers perceive that all decision-making and control lies in managerial positions and is not within their own control [17]. Acknowledging this, some scholars argue that the CL should be a qualified teacher who ignites constructive dialogue regarding teaching and learning [16].

In order to promote the flow of new information and practical knowledge, a CL should be open to the wider professional networks and courses. McLaughlin and Talbert show that there are effective forums for teachers’ learning outside of school courses [19]. This idea might seem contradictory to the previous discussion on teachers’ learning in school and classroom contexts. However, McLaughlin and Talbert explain that they are not referring to pre-packaged and decontextualized workshops, but to socialization with other teacher networks and courses that serve as a “catalyst and support for the instructional improvement in a teacher community” [19,p. 65]. Therefore, one of the main differences between effective and ineffective outside of school courses lies in the learning environment of the course. Effective outside of school courses provide teachers with opportunities to network with colleagues and connect their learning to the larger conversation occurring within their CL. Considering this finding, professional networks and well-designed courses could be used to bolster the professional learning within a CL.

The Dominican educational system does not enjoy an in-service education with the learning environment described above [20]. Based on the account of the aforementioned research, I argue that by adopting a community-based model of professional development, the Dominican teachers may optimize teaching and learning. I also suggest that the role of a teacher leader (TL) within a CL could provide new opportunities for leadership within the Dominican school contexts. Furthermore, the construction of this teacher community paradigm in the DR may be fostered by professional networks and courses that work in conjunction with the CLs.

4. Conclusion

Educating qualified teachers is one of the biggest challenges in the Dominican Republic, and has been one of the main priorities of educational reform in the last 20 years. Nevertheless, these reforms have consistently addressed what teachers should learn, instead of generating a dialogue to understand how teachers learn. In the Dominican Republic, professional development for teachers is implemented through fragmentary workshops that (a) follow a fixed curriculum designed and delivered by external entities (b) outside of the school context.

Republic Ministry of Education (MINERD) has traditionally supported and promoted these workshops, research on teacher professional development suggests that this approach is not successful in developing teacher learning. It refuses to conceptualize teachers as active learners and fails to provide a systematic process for questioning preconceptions about instruction and linking theory to practice. Based on this, I argue that MINERD is sustaining an inadequate model of TPD and I urge MINERD to examine its current structures for teacher professional development. Failure to reconsider these structures may hinder teachers’ professional growth and reinforce the current professional conditions for teachers, negatively impacting student outcomes.

Complimentary to the previous argument, research on TPD indicates that teachers learn better in their profession through socialization, reflection, and finding solutions for the particular needs of their students. In this sense, I bring awareness to that fact that teachers become experts through a long-term process of continual learning that extends far beyond periodic workshops. I emphasize that school-based Communities of Learning (CLs) could serve as a framework to transform Dominican in-service education.
Furthermore, I contend that MINERD can achieve their desired goal of improving the quality of teaching by (a) building structures to establish collaborative professional activities within the school context; (b) creating new forms of leadership within a CL; and (c) using the available funding and existing external support to help teachers succeed in their particular context within a CL.

The enactment of successful professional activities requires that MINERD redesign and implement effective policies to support authentic teacher professional growth. Changing the TPD paradigm might generate stakeholder conflicts; however, if MINERD does not take bold action to improve the structure of TPD, the professional status quo in the teaching force will persist. Teacher professional growth does not occur through pre-packaged instruction delivered by external entities, but by empowering teachers to link theory with practice. Teacher in-service education must be an imperative piece of the conversation around Dominican education: it is time that teachers have the opportunity to learn effectively and positively impact Dominican pupils.

5. Reference


Session 13: ICT developments and diffusion

The Impact of Students’ ICT Use on Mathematical Performance in Korea
(Author: Hyesook Kim)

Impact of ICT on Ranking of the Premier Indian Universities: A Study Based On Alexa Traffic
(Author: Amjad Ali)

Investigating the Use of an eBook in an ICT Course
(Author: Janet Liebenberg)
The Impact of Students’ ICT Use on Mathematical Performance in Korea

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Abstract

This work studies whether ICT use predicts mathematical performance in 15-year-old students in Korea or not. Data used is from PISA 2015. The multi-level models are used. The results show four findings: First, the more students use ICT for school assignments, the higher their mathematical performance is. Second, ICT use for communication out of school has negative effects on mathematical performance. Third, ICT use at school and in class was found to generally have negative effects on mathematics. Finally, students who clearly recognize the limits of computer tend to have high mathematical performance. The limitations of the study and a few directions of the further study are discussed.

1. Introduction

The main objective of this work is to investigate the effect of ICT (Information Communication Technology) use on mathematical performance in 15-year-old students. The ICT use is not a proximal variable that directly affects performance like as learning attitude or teaching and learning strategies. Many studies shows the results between ICT use and academic achievement are not conclusive: whereas some studies find evidence of a positive relation [1] [2], other studies find negative or non-existent relation [3] [4]. Since a computer is a tool that controls and delivers information during performing tasks, the effects of ICT use on academic achievement vary depending on how it is applied for knowledge structuring activities. Considering these perspectives, it could not be assumed that the more students use ICT at school or home the more effectively it improves their performance. This study will be focused on the effect of ICT use on mathematical performance in regard to for what purposes students use ICT at school and home. Also the relationship between attitude toward computer use and mathematical performance will be investigated.

2. Methods

2.1 Variables

The multi-level models were applied to analyze the influence of ICT use on mathematical performance after controlling students or school's variables that may affect mathematical performance. The control variables are composed of individual-level variables such as gender and socioeconomic status and school-level variables including socioeconomic status of school and school establishment type (private/public). Descriptive statistics of student-level and school-level variables is as shown in Table 1 and Table 2. The analysis target is 4,927 students aged 15 years old of 154 schools, missing values of each question were excluded.

Detailed variables of ICT use are as follows: 1) ICTHOME (the accessibility to ICT at home) refers to what kinds of ICT devices, such as computer, internet, mobile phone, MP3, and printer, students have at home and how they can easily use or access to those devices. 2) ICTSCH (the accessibility to ICT at school) is what kinds of ICT devices, such as computer, internet, and printer, school has and how students can easily use or access to those devices. The higher this value is the more accessible ICT devices are. 3) ICTENT (ICT use for entertaining purposes) is a standard index indicating how much students use computer at home for entertaining purposes such as game, chatting, software download, blogging, etc. 4) HOMESCH (ICT use for school assignments) is how often students use computer outside of school for study including internet search, e-mail use for communication, school website search, visit to school homepage, and school assignment. 5) USEMATH (ICT use for mathematics class) is composed of function graph drawing, calculation, diagram drawing, data recording on spreadsheet, and histogram drawing in class. 6) USESCH (Frequency of using ICT at school) is an index representing how often students use computer for various purposes including online chatting, e-mail, internet search, etc.

Variables related to ICT use are factor scores converted into standardized indexes whose average
is 0 and standard deviation is 1 through principal component analysis on subordinate items of the variables [5]. As a result of a consistent reliability analysis on questions relevant to each subordinate items, most variables were about and over .70, which is normal. However, ICTHOME (accessibility to ICT at home) was found to be relatively low at .545 because its subordinate items include traditional ICT devices such as computer and internet, as well as entertaining devices such as MP3 and video game.

As a result of an exploratory factor analysis on questions associated with students’ computer use outside of school, three factors are drawn in Table 3. Principal axis factoring was used for a factor analysis and Varimax rotation was applied because the independence between items could not be assumed. Factors 1, 2, and 3 were named as a computer use for routine (ICTROUT), communication (ICTCOM), and game (ICTGAME) respectively. First, computer use for routine was composed of read news, browse the internet for fun, and obtain the practical information from the Internet and etc. Second, computer use for communication was composed of chat on line and social network. Third, computer use for game was composed of collaborative games and one player games. Also with an exploratory factor analysis on questions associated with attitude of computer use, two factors were drawn in Table 4. Attitudes to computer are divided into ‘recognition of usefulness’ (Factor1) and ‘recognition of limits’ (Factor2).

ICTATPO (recognition of limits) is composed of ‘troublesome for study’, ‘not suitable to use computer for school assignments’, and ‘too unreliable’, whereas ICTATTNE (recognition of usefulness) is composed of ‘useful for school work’, ‘source of information’, and ‘homework more fun’. The descriptive data of variables in the study are shown in Table 5.

### 2.2 Analysis Model

In this study, two-level hierarchical models were used [6]. The variables were put into the analysis model stage by stage. First of all, the size of student-level and school-level variances was investigated with the Unconditional Model where any variables are not included. In Conditional Model 1, the influences of ICT use on mathematical performance were analyzed by including ICT-related variables. In Conditional Model 2, the effects of ICT-related variables were identified based on controlling individual variables such as gender and socioeconomic status. In Conditional Model 3, that is final model, the influences of school-level ICT variables were identified with controlling school variables of school establishment type and average socioeconomic status.

Firstly, in level 1 of Unconditional model (random-effect ANOVA), $Y_{ij}$ is a dependent variable of Individual $i$ of School $j$, meaning mathematical performance. $\beta_{0j}$ is the average of School $j$ and $r_{ij}$ is an random error indicating the difference between the average of school and Individual $i$ of School $j$, where we will assume that $r_{ij} \sim N(0, \sigma^2)$. Level 2 divides the school average into fixed effects and random effects: $\beta_{0j}$, the average of school, is divided into the fixed effects, $\gamma_{00}$, which are the total average, and random effect, $u_{0j}$, which are the degree of deviation of school from the total average.

\[
\text{Level 1: } Y_{ij} = \beta_{0j} + r_{ij}, \quad r_{ij} \sim N(0, \sigma^2)
\]

\[
\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}
\]

For the conditional model (within-school model), in level 1, where individual explanatory variables $X_{ij}$ of 1... $\Omega$ were included, $\beta_{0j}$ indicates how mathematical performance is distributed as a function of measured student characteristics through grand-mean centering.

\[
\text{Level 1: } Y_{ij} = \beta_{0j} + \sum_{s=1}^{S} \beta_{sj} X_{sj} + r_{ij}, \quad r_{ij} \sim N(0, \sigma^2)
\]

In Level 2 Model, school-level variables that have significant effects on student-level average were investigated after setting intercept, $\beta_{0j}$, as a random effect varying depending on school and applying school-level explanatory variable $W_{sj}, s = 0, \ldots, p$. As for slope, $\beta_{sj}$, the fixed effect model is assumed to secure its reliability. The key feature of the model is assumed to vary at level 2.

\[
\beta_{sj} = \gamma_{0s} + \sum_{s=1}^{S} \gamma_{0s} W_{sj} + u_{0j}
\]

Also mathematical performance data in PISA were provided as five plausible values [5]. In order to obtain the coefficient and standard error of achievement of each sector, the average of coefficients should be obtained and the standard error should be calculated based on each standard deviation of standard error. In this process, an analysis should be conducted considering weighting, in order to compensate stratified sampling. HLM 6.04 Program was used for an analysis [7]. Next, the correlation was found between subordinate variables composing standardized indexes of ICT use and academic performance.
3. Results

Considering the results of the multi-level model analysis on mathematical performance, statistically significant variables among ICT variables are as follows in Table 6.

First, ICT use for school assignments at home was found to have statistically significant positive effects on mathematical performance at \( \alpha=.01 \). In other words, students who have one more point in 'ICT Use for School Assignment at Home' tend to have 7.67 higher points in mathematical performance, even after individual and school variables are controlled.

Second, it was found that computer use for communication outside of school has negative effects at \( \alpha=.05 \) and game or routine use does not have statistically significant effects. Thus, students who have one more point in 'ICT Use for Communication outside of School' tend to have 6.80 lower points in mathematical performance, even after gender and socioeconomic status are controlled.

Third, ICT use in mathematics class and ICT use at school were found to have statistically significant negative effects on mathematical performance at \( \alpha=.05 \) and \( \alpha=.001 \), respectively. In other words, students who have one more point in 'ICT Use in Mathematics Class' tend to have 10.86 lower points in mathematical performance, even after gender and socioeconomic status are controlled. Students who have one more point in 'ICT Use at School' tend to have 10.59 lower points in mathematical performance.

Fourth, ICTATTNE (recognition of usefulness) and ICTATPO (recognition of limits) of attitudes to computer brought different results. Although recognition of usefulness did not have statistically significant effects, recognition of limits was found to have statistically positive effects at \( \alpha=.01 \). Thus, students who have one more point in recognizing the limits of computers tend to have 7.84 higher points in mathematical performance.

Finally, the expectations of students’ internet use at school and the number of computers per student, which are school-level ICT variables, were found not to have statistically significant effects.

For further information, as for the intra-class correlation (ICC) of each subject, the base model was found to be 0.642, but the conditional model was found to increase by 0.665, 0.694, and 0.769 for each conditional model respectively. In mathematics, the final conditional model was found to account for 59.99 % of school-level variables and 22.13 % of student-level variables. In addition, the reliability coefficient of the final conditional model was favorable at 0.918.

4. Discussion

According to the comparative study on ICT use of Korea and OECD countries [8], the level of ICT use of 15-year-old students of Korea is generally low. In particular, their ICT use at school was found to be low. Korean students, however, show a pretty high level of mathematical performance compared with other OECD countries. As a result of the correlation of ICT use and PISA performance, in the regard that PISA questions were used to measure an ability to apply knowledge learned at school to new problem solving situations, information collection activities including information search or data downloading were found to have positive influences as shown in this study. Interactive activities such as chatting, e-mailing for communication, and information sharing using ICT, however, were found to have negative effects, an indication that a strategy for selective ICT use for students is required.

In addition, the fact that ICT use at school generally has negative effects on mathematical performance suggests that students do not use ICT to compose knowledge and resolve a problem by themselves. Especially, the negative effects of routine task performance such as posting on school website or simulation raise doubts if current activities at school are conducted to the direction irrelevant to learning. ICT use at school and class was found to generally have negative effects on mathematics. However, special attention should be given to potential bias problems when ICT use is an endogenous variable [9]. By controlling for endogeneity, computer use for reading is not related to reading performance.

5. Conclusion

In the study, students’ ICT use for school assignments was found to have positive effects on mathematical performance. In other words, the more students use ICT for school assignments, the higher their mathematical performance is. However, ICT use for communication such as chat online and social network out of school has negative effects on mathematical performance. This means how students use computer out of school, that is, with what purpose they use computer matters in regard to academic performance.

For attitudes to computer, students who clearly recognize the limits of computer tend to have high mathematical performance, whereas recognizing the usefulness of computer does not significantly influence academic achievement. It was found that negative subordinate items composing ICTATPO such as 'interruptive for study', 'not suitable to use computer for school assignments', and 'low reliability' are relevant to mathematical performance.
This means the importance of students’ critical perspectives toward ICT use.

The result of the study implies that for what and how education using ICT should be applied, that is, its qualitative aspects should be considered importantly, as well as its quantitative aspects. Especially, more empirical studies on interactions using ICT are required for many adolescents because they recently tend to rely on SNS (Social Network Services). In addition, a qualitative approach is necessary to closely investigate and observe how adolescents use ICT and how it is associated with study at school learning. In addition to cognitive performance, the influences of ICT-related variables on affective domains such as academic motivation and self-conception and social aspects including communication and cooperation ability should be studied through follow-up studies. Moreover, as part of studies of school education, a program that guides how teachers and parents should teach ICT use of adolescents should be developed.

6. References


### Table 1 Descriptive statistics of student level variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Case Number</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV1MATH</td>
<td>4,876</td>
<td>556.01</td>
<td>98.30</td>
<td>113.11</td>
<td>891.35</td>
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<td>871.87</td>
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<td>98.88</td>
<td>159.85</td>
<td>892.05</td>
</tr>
<tr>
<td>PV5MATH</td>
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<td>555.91</td>
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<td>177.76</td>
<td>885.89</td>
</tr>
<tr>
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<td>0.50</td>
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<td>1.00</td>
</tr>
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<td>ESCS</td>
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<td>0.02</td>
<td>0.74</td>
<td>-3.20</td>
<td>1.98</td>
</tr>
</tbody>
</table>

- **PV1MATH** is Math Plausible Value 1
- **PV2MATH** is Math Plausible Value 2
- **PV3MATH** is Math Plausible Value 3
- **PV4MATH** is Math Plausible Value 4
- **PV5MATH** is Math Plausible Value 5

**Gender** is coded as 0: male, 1: female

**ESCS** is the Index of economic, social, and cultural status

### Table 2 Descriptive statistics of school level variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Case Number</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
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</thead>
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<tr>
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<td>0.90</td>
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</table>

- **SCHTYPE** is coded as 0: private, 1: public

- **MESCS** is the mean of students’ index of economic, social, and cultural status in each school

### Table 3 Rotated factor matrix for computer use out of school

<table>
<thead>
<tr>
<th>Activity</th>
<th>Factor1</th>
<th>Factor2</th>
<th>Factor3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read news</td>
<td>.658</td>
<td>-.057</td>
<td>-.034</td>
</tr>
<tr>
<td>Browse the Internet for fun</td>
<td>.642</td>
<td>.032</td>
<td>.051</td>
</tr>
<tr>
<td>Obtain the practical information from the Internet</td>
<td>.631</td>
<td>-.039</td>
<td>-.064</td>
</tr>
<tr>
<td>Download music</td>
<td>.555</td>
<td>.110</td>
<td>.170</td>
</tr>
<tr>
<td>Use email</td>
<td>.379</td>
<td>.174</td>
<td>.094</td>
</tr>
<tr>
<td>Upload content</td>
<td>.330</td>
<td>.193</td>
<td>.161</td>
</tr>
<tr>
<td>Chat on line</td>
<td>.318</td>
<td>.714</td>
<td>.124</td>
</tr>
<tr>
<td>Social networks</td>
<td>.393</td>
<td>.666</td>
<td>-.157</td>
</tr>
<tr>
<td>Col-laborative games</td>
<td>.166</td>
<td>.025</td>
<td>.728</td>
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<tr>
<td>One player games</td>
<td>.177</td>
<td>-.008</td>
<td>.578</td>
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### Table 4 Rotated factor matrix for attitude of computer use

<table>
<thead>
<tr>
<th>Attitude</th>
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<tr>
<td>Useful for school work</td>
<td>.806</td>
<td>-.015</td>
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<tr>
<td>Source of information</td>
<td>.770</td>
<td>-.046</td>
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<tr>
<td>Homework more fun</td>
<td>.718</td>
<td>-.008</td>
</tr>
<tr>
<td>Not suitable for school work</td>
<td>-.011</td>
<td>.832</td>
</tr>
<tr>
<td>Too unreliable</td>
<td>.082</td>
<td>.653</td>
</tr>
<tr>
<td>Troublesome for study</td>
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<td>.549</td>
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### Table 5 Descriptive statistics for ICT variables

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<th>Mean</th>
<th>SD</th>
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<th>Max</th>
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### Table 6 Effects of ICT use on mathematical performance

<table>
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<th>Variables</th>
<th>Unconditional Model</th>
<th>Conditional Model 1</th>
<th>Conditional Model 2</th>
<th>Conditional Model 3</th>
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<td>535.85(7.09)***</td>
<td>542.77(7.20)***</td>
<td>560.60(6.83)***</td>
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<tr>
<td>HOMESCH</td>
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<td>-6.80(2.29)**</td>
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<td>Context Variables</td>
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<tr>
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<td>.949</td>
<td>.943</td>
<td>.918</td>
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<td>Random effects</td>
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<td></td>
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<tr>
<td>School variance</td>
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<td>3231.14</td>
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<td>1874.85</td>
</tr>
<tr>
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<td>6421.07</td>
<td>6259.86</td>
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</tr>
<tr>
<td>Intra Class Correlation(ICC)</td>
<td>.642</td>
<td>.665</td>
<td>.694</td>
<td>.769</td>
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</table>

+ < .10, *<0.05, **<0.01, ***<0.001
Impact of ICT on Ranking of the Premier Indian Universities: A Study Based On Alexa Traffic

Amjad Ali
Aligarh Muslim University, India

Abstract

The last decade has witnessed an extensive research on assessing the impact of Information and Communication Technologies (ICTs) on education, specially, on the institutions of higher learning. A large number of researches have been conducted to find out and compare the performance of institutions in relation with the access to new ICT tools, hence, the study the ICT infrastructure and learning resources available to the universities may enhance the level of research in the institution of higher learning.

In this paper, the impact of ICT environment on four high ranking universities of north India; namely; the Aligarh Muslim University, Banaras Hindu University, Delhi University and Jawaharlal Nehru University, Delhi has been studied in relation with their national ranking. Two universities each have been selected from the capital of India and its join state of Uttar Pradesh in view of their different ICT environment but the same funding and same assessment agency for all i.e. the University Grants Commission.

Data for this study on the various aspects of ICT application relating to the selected universities was retrieved by using the Alexa Rank Checker in the first week of July, 2016 and analyzed recently in context of the internet speed available to each institution. The study concludes that the universities with better ICT infrastructure and larger electronic resources, generally, achieve higher ranking.

1. Introduction

India has a large system of higher education based on 761 universities including 47 being funded by central government directly. The periodic assessment of the universities is a regular process in the country in order to assess their performance and remove shortcomings. There are many government as well as private agencies which undertake the work of assessment including the University Grants Commission (UGC) but the process adopted for it is time taking and expensive whereas there are tools available on the Internet which take lesser time and are inexpensive.

Technology has brought serious changes in the society during the last fifty years. About 50 years ago, information technology (IT) was predicted as “the ultimate technology” [1]. From 1980s onwards, the merger of IT with advanced communication systems enabled interactive communication unhindered by distance, volume, medium or time which also reduced the cost of co-ordination [2] communication and information processing (Dean, 2002 [3]. Information and Communications Technology (ICT), an integration of information processing, computing and communication technologies is changing the way we learn, work and live in society.

Recently, ICT has become popular to broaden the term to explicitly include the field of electronics [4]. But their developmental process rested primarily on the availability of technological infrastructure which created a gap in the development of institutions. The gap created by the non-availability of information and communication technologies and learning resources is reflected in the performance of institutions. Internet hosts a number of search engines which provide statistical data on usage of learning resources in different ways.

The need for ranking of the universities was highlighted way back in 2003 in a review of university-industry collaboration in Britain. The idea for the rankings universities was credited in Ben Wildavsky's book, The Great Brain Race: How Global Universities are Reshaping the World [5], to then-editor of Times Higher Education (THE) who chose to partner with educational and careers advice company Quacquarelli Symond (QS) to supply the data on ranking. Between 2004 and 2009, QS produced the rankings in partnership with THE. In 2009, THE announced that they would produce their own rankings, the THE World University Rankings, in partnership with Thomson Reuters. The first rankings produced by QS independently of THE, and using QS's consistent and original methodology, were released in 2010.

2. Ranking Agencies

Beside QS, there are other ranking providers as listed along with their URLs below [6]:

- 100BestWebsites, tp://www.100bestwebsites.org;
• ComScore Media Metrix, http://www.comScore.com;
• Nielsen, http://www.nielsen-netratings.com
• PC Magazine Top Websites, http://www.pcmag.com/article2/0,1759,1554010,00.asp
• Ranking.com http://www.ranking.com;
• Time’s, http://www.time.com/time/2005/websites;
• Websearch, http://www.websearch.com;
• Web100, http://www.web100.com;

2.1. Alexa Internet

Alexa Internet Incorporation is a California-based subsidiary company of Amazon.com which is known for its toolbar and website. Once installed, the toolbar collects data on browsing behavior which is forwarded to the website where it is stored and analyzed and becomes the basis for the company’s Web traffic reporting. Alexa claims that about 6.5 million people visit its website monthly [7].

2.2. Selection of the Indian Universities

Selection of the universities for this study has been made in view of their prominence, ICT infrastructure and the digital resources available to the users. The universities under study have been ranked high by various national and international agencies like Ministry of Human Resource Development in India and the Times Higher Education Asia Ranking during the last ten years. Two of the four universities are located in the capital of the country whereas the rest belong to the adjoining state of Uttar Pradesh which is having a considerably varied amount of ICT infrastructure. All of them offer courses of study in about all disciplines of study.

2.3. Ranking the Universities

The website ranking tools produce traffic rankings and statistics based on those people who access the sites while using them. The traffic rank is generally based on a period of usage such as three months. Traffic is computed for sites, which are typically defined at the domain level. Also, sites which are found to be serving the same content (mirrors) are generally counted together as the same site.

3. Need of the Study

With a population of 1.25 billion people, India is the most populous democracy in the world which is governed under a parliamentary system. The country has a large system of higher education comprising of 761 universities including 47 central universities being funded by the central government. The need for this study is that; (i) the ranking of the universities at the national and international levels reflects the extent of utility of funds and its outcome in terms of excellence; (ii) periodic assessment of institutions is necessary to find out their progress and shortcomings at a regular interval; (iii) the traditional methods of assessment being lengthy and time taking, the method of Alexa ranking saves time as well as economize the resources; (iv) It is necessary to study the ICT infrastructure and usage of learning resources in order to assess its impact; and (v) ranking helps in future planning of the institutions.

4. Objectives of the Study

The main objectives of this study are:

• To identify the websites of the premier central universities in India;
• To study the ICT infrastructure available in the selected universities;
• To locate the bouncing of searches, daily page views per visitor and the daily time spent on site;
• To study the availability of learning resources of the selected universities;
• To find out the national and global ranks of the identified websites;
• To calculate and compare the ranks of the selected central universities;
• To find out the reasons for variation in ranking;
• To impart suggestions for better performance of the universities in India.

5. Methodology

In order to carry out this study, four high ranking universities of India were identified following the main criteria of their performance during the last five years, source of funding, geographical location, courses offered and the size. Background information about the universities was collected from the reference tools available in the Library of the Aligarh Muslim University about their websites. Google.com was used to retrieve the relevant data. The four universities ranking high during the last few years were identified as the Aligarh Muslim University, Aligarh (UP), Banaras Hindu University, Varanasi (UP), Jawaharlal Nehru University, New Delhi and the University of Delhi, New Delhi. Out of the four universities, two each are located in the state...
of Uttar Pradesh and Delhi, the capital of the country and the same have been selected for the disparity in the ICT infrastructure of both the places. Alexa Ranking system providing one of the most authentic figures as available was chosen for this purpose.

6. Assessing the Impact

Alexa Internet produces traffic rankings and statistics based on those people who access the sites while using the Alexa toolbar. Alexa computes traffic rankings by analyzing the Web usage of millions of Alexa Toolbar users and data obtained from other, diverse traffic data sources. The information is sorted, sifted, anonymized, counted, and computed, until finally, it gets the traffic rankings shown in the Alexa service. For this study, we have been confined to the data on the global rank and rank in India in relation with the ICT infrastructure available to the universities studied. The websites monitor the incoming and outgoing traffic to see which parts or pages of their site are popular and if there are any apparent trends, such as one specific page being viewed mostly by people in a particular country. The amount of traffic indicates the popularity of websites and the necessity of making changes according to the needs.

6.1. Global Rank

The rank is calculated using a combination of average daily visitors to a particular university and page views over the last 3 months. The site with the highest combination of visitors and page views is ranked #1.

6.2. Rank in India

The rank in India is calculated using a combination of average daily visitors to the websites and page views from users from India over the past three months. The site with the highest combination of visitors and page views are ranked #1 in the country.

7. Collection of Data

The background information for the study was collected in June, 2016 mainly from the websites of the universities using the www.google.com search engine and later compared with bibliographical tools. The information includes names and location of the universities, their web address, year of establishment and the strength of students and faculty. The data so received has been presented in Table 1.

Table 1. Background Information collected from www.google.com
(Source: www.google.com)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name and Address of the University</th>
<th>URL of the University</th>
<th>Established Year</th>
<th>No. of Students</th>
<th>No. of Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aligarh Muslim University, Aligarh (UP)</td>
<td><a href="http://www.amu.ac.in">www.amu.ac.in</a></td>
<td>1875</td>
<td>10000</td>
<td>2000</td>
</tr>
<tr>
<td>2.</td>
<td>Banaras Hindu University, Varanasi (UP)</td>
<td><a href="http://www.bhu.ac.in">www.bhu.ac.in</a></td>
<td>1916</td>
<td>27000</td>
<td>2395</td>
</tr>
<tr>
<td>3.</td>
<td>Jawaharlal Nehru University, New Delhi</td>
<td><a href="http://www.jnu.ac.in">www.jnu.ac.in</a></td>
<td>1959</td>
<td>3500</td>
<td>370</td>
</tr>
<tr>
<td>4.</td>
<td>University of Delhi, New Delhi</td>
<td><a href="http://www.delhi.ac.in">www.delhi.ac.in</a></td>
<td>1922</td>
<td>132435</td>
<td>Not found</td>
</tr>
</tbody>
</table>

In order to validate the data as retrieved, some bibliographical sources were also searched which mainly include the Europa World of Learning and the Universities Handbook brought out by the Association of Indian Universities, New Delhi. The data as given below in Table 2 is based on the 65th edition of the Europa World of Learning which was published in 2015.

Table 2. Background Information Collected from Bibliographical Sources
(Source: Europa World of Learning 65th edition)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name and Address of the University</th>
<th>URL of the University</th>
<th>Established Year</th>
<th>No. of Students</th>
<th>No. of Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aligarh Muslim University, Aligarh (UP)</td>
<td><a href="http://www.amu.ac.in">www.amu.ac.in</a></td>
<td>1875</td>
<td>3999</td>
<td>1440</td>
</tr>
<tr>
<td>2.</td>
<td>Banaras Hindu University, Varanasi (UP)</td>
<td><a href="http://www.bhu.ac.in">www.bhu.ac.in</a></td>
<td>1915</td>
<td>23000</td>
<td>2700</td>
</tr>
<tr>
<td>3.</td>
<td>Jawaharlal Nehru University, New Delhi</td>
<td><a href="http://www.jnu.ac.in">www.jnu.ac.in</a></td>
<td>1959</td>
<td>3599</td>
<td>357</td>
</tr>
<tr>
<td>4.</td>
<td>University of Delhi, New Delhi</td>
<td><a href="http://www.delhi.ac.in">www.delhi.ac.in</a></td>
<td>1922</td>
<td>150000</td>
<td>270</td>
</tr>
</tbody>
</table>

8. ICT and Learning Resources

ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. The main components of ICT considered for this study are related with the reaction of users in response to the available infrastructure and learning resources. In Indian context, bandwidth play an important role, therefore, the same has been elaborated.

8.1. Bandwidth

Bandwidth describes the maximum data transfer rate of a network or Internet connection. It measures how much data can be sent over a specific connection in a given amount of time. It is an important component of the network and essential
for determination of the fast and effective service of network users. The bandwidth of the universities considered for this study is shown in Table 3 and Figure 1.

Table 3. The bandwidth of the universities

<table>
<thead>
<tr>
<th>University</th>
<th>Bandwidth in GBPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligarh Muslim University</td>
<td>1</td>
</tr>
<tr>
<td>Banaras Hindu University</td>
<td>0.825</td>
</tr>
<tr>
<td>Jawaharlal Nehru University</td>
<td>1</td>
</tr>
<tr>
<td>Delhi University</td>
<td>3</td>
</tr>
</tbody>
</table>

Figure 1. Internet Bandwidth of the Universities provided by National Knowledge Network

8.1.1. Learning Resources. In broader terms, learning resources are defined as texts, videos, software, and other materials that teachers use to assist students to meet the expectations for learning but we have been confined to the links of other’s resources provided on the websites of the university under study which is reflected in the ‘Sites Linking In with the universities.

8.1.2. Sites Linking In. The sites linking in show the number of other website linked to the website studied. It denotes the richness of resources of other institutions within the reach of the universities besides the resources available through intranet.

Figure 2. Results of Sites Linking In

Figure 2 shows that the highest number of sites is linked to Delhi University i.e. 3238 followed by JNU 1927, BHU 1499 and AMU 1015.

9. Data Interpretation

Data for this study was retrieved in June, 2016 using the Alexa rank checker and is presented in Table 4.

Table 4. Retrieved Data using the Alexa rank checker

<table>
<thead>
<tr>
<th></th>
<th>Global Rank</th>
<th>Rank for India</th>
<th>Bounce Rate</th>
<th>Daily Page views per User</th>
<th>Daily Time on Site</th>
<th>Loading Speed</th>
<th>Sites Linking In</th>
<th>Top Keywords % Usage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMU</td>
<td>8642</td>
<td>6125</td>
<td>25.69%</td>
<td>2.19</td>
<td>7.24</td>
<td>1.542 Seconds, 50% of sites are images</td>
<td>2955</td>
<td>65.40%</td>
</tr>
<tr>
<td>BHU</td>
<td>21174</td>
<td>9693</td>
<td>25.80%</td>
<td>2.64</td>
<td>7.66</td>
<td>1.827 Seconds, 65% of sites are images</td>
<td>2779</td>
<td>79.37%</td>
</tr>
<tr>
<td>JNU</td>
<td>23831</td>
<td>2282</td>
<td>27.70%</td>
<td>4.74</td>
<td>7.14</td>
<td>1.906 Seconds, 55% of sites are images</td>
<td>3027</td>
<td>85.26%</td>
</tr>
<tr>
<td>DU</td>
<td>1050</td>
<td>248</td>
<td>21.49%</td>
<td>7.44</td>
<td>7.13</td>
<td>2.09 Seconds, 50% of sites are images</td>
<td>2226</td>
<td>85.72%</td>
</tr>
</tbody>
</table>

(Source: http://www.iwebtool.com/alexa_traffic_rank)

10. Data Interpretation

The investigator examined the following parameters:

1. Bounce Rate
2. Daily page views per visitor
3. Daily time spent on onsite
4. Search Visits
5. Top keywords use

10.1. Bounce Rate

Bounce rate reflects the percentage of visits to the site that consist of a single page views which is presented in Figure 3.

Figure 3. Bounce Rate

It is evident from the Graph that the bounce rate is highest in case of AMU i.e. 53.80% followed by BHU & JNU at 39.70% and 27.70% respectively whereas the lowest bounce rate 21.40% is found in DU.

10.2. Daily Page views per Visitor

The daily page views per visitor represent the estimated daily unique page views per visitor on the site as depicted in Figure 4.
10.3. Daily Time Spent on Site

The daily estimated time spent on site is shown in minutes and seconds is shown in Figure 5.

The highest estimated time per visitor is spent i.e. 7:43 spent in DU followed by JNU 5:14, BHU 2:49 and AMU 2:24 which is the lowest.

10.4. Search Visits

Search visit refers to the percentage of visits to a particular site coming from a search engine and the same are shown in Figure 6.

10.5. Top Keywords Used

Figure 7 shows the percentage of top keywords that sent traffic to the concerned university site from major search engine. The list of keywords is updated monthly.

The Graph shows that the keyword DU receives the highest percentage of search traffic followed JNU, BHU and AMU, i.e. 60.58%, 57.17% and AMU 25.7% respectively.

11. Suggestion

- Higher Internet bandwidth and computer system of latest configuration be used to reduce the bounce rate and save the time of users in the universities;
- Learning resources available be added in greater quantity by way of providing links to the webpages considering the intellectual property rights (IPR) issues;
- The most popular and user friendly top keywords be used for retrieval of information and if possible, the technique of term truncation be employed to remove confusion and diverting the web traffic to the top keywords only; and
- The platform proving higher speed with lesser chance of being infected should be preferred.

12. Conclusion

It has been found from the study that the universities located in larger cities generally perform better for having a better ICT infrastructure and access to larger learning resources. However, the techniques employed for access to information save the time of users and guide create a better environment of learning as evident from the data and its interpretation.

12. References


Investigating the Use of an eBook in an ICT Course

Janet Liebenberg
North-West University, South Africa

Abstract

Students in university classes are believed to have grown up with new technologies but it is essential to understand the impact of the implementation of technology in the academic setting. This quantitative study investigated the students’ views on the use of an eBook as textbook in an ICT course, as well as the determinants of individual students’ intentions to use the eBook. The study makes use of the Unified Theory of Acceptance and Use of Technology (UTAUT). Four months after an eBook had been introduced, a questionnaire was completed by 738 first-year students in an ICT course. Results indicate positive views about the eBook but these students in South Africa are not your typical Net generation, since there is a slight inclination towards an old-fashioned textbook. It was further found that students’ intentions are highly influenced by their attitude toward using technology, performance expectancy, and facilitating conditions, whereas effort expectancy and self-efficacy have a moderate correlation with intention and anxiety has a small negative influence.

1. Introduction

We are told that there is a new population emerging from young people born after the time when digital technologies began to be part of everyday life. These young people, having grown up with computers and the Internet are said to have a natural aptitude and high skill levels when using new technologies and this generational shift has consequences for approaches to teaching and learning [1]. However, this claim does not necessarily apply to a developing country such as South Africa. In a time of rapid technological changes, the problem of how to efficiently educate students whilst successfully deploying new technologies remains a crucial open question. To better understand how lecturers should deal with new technologies in teaching and learning, the present research investigates the use of an eBook as textbook in an ICT course.

2. Conceptual framework

2.1 Students and technology

There is a new population of young people who may have never known life without the Internet and digital technologies [2]. This group of young people is described as the Net generation, also known as the Millennial Generation, Generation Y or Digital Natives. These young people (especially people born in the US and Canada between the early 1980s and the late 1990s) have grown up with computers and the Internet and therefore they have high skill levels and a natural ability when using new technologies [3]. Their early and omnipresent exposure to technology has defined their learning preferences, their social choices, their modes of communication, and their entertainment preferences [4]. Jones et al. [1] and Oblinger and Oblinger [3] have described some characteristics of the Net generation: the Net generation comprises individuals who believe it is cool to be smart; are fascinated by new technologies; are racially and ethnically diverse; value social networking; are not politically active, but community-centred; expect quick rewards; are impatient with linear thinking; and display a novel capacity for multitasking.

The learning preferences of Digital Natives are: they prefer multitasking; prefer receiving information quickly; are masters at processing information rapidly; prefer non-linear access to information; have a low tolerance for lectures; prefer active rather than passive learning; rely heavily on communications technologies to access information and to carry out social and professional interactions; expect to be engaged by their environment with participatory, sensory-rich, experiential activities (either physical or virtual); are more oriented to visual media opportunities for input than previous generations; prefer to learn by doing rather than by telling or reading; and prefer to discover rather than be told [5] [6] [7] [8] [9].

Numerous people analyse the main traits of different generations, but Hoover [10] warns that it can be a strong form of stereotyping and that not all university students fit into one mould. Bayne and
Ross [11] highlight the way in which the categorisation of the ‘digital native’ works to homogenise diverse and varied groups of individuals, using generational categorisation to over-determine student characteristics and relations to technology.

The students in developing countries cannot be described as the Net generation, since Internet penetration for households in 2015 was a mere 34.1% whereas Internet access for households in developed countries with 81.3% is close to saturation. South Africa was ranked 43rd amongst developing countries, with 37.3% of South African households using the Internet [12].

Nash [13] assessed computer skills of over 4 000 first-year students at a South African university and found that many students entering South African universities for the first time are not adequately equipped with the computer skills that they will need during their first year of study and African students are most at risk of being disadvantaged by their lack of prior skills.

The statement that universities and educators have to make radical changes because of students’ radically different approach to learning is not new and it continues to be a controversial subject. Bayne and Ross [11] call for a more carefully critical and nuanced understanding of the effects of new technologies on the practices and subject positions of learners and educators alike.

The Higher Education Horizon Report annually shares emerging trends and technologies predicted to impact colleges and universities in the USA. In 2008, the Report [14] mentioned the Amazon Kindle eBook reader for the first time. The 2010 Report [15] notes that eBooks are connecting with consumers for general reading but identifies availability, illustration limitations, and publishing of academic titles as obstacles. eBooks make the technologies to watch list in the 2011 Report [16]. Also discussed is the transition from eBooks being simply a reproduction of print titles to evolving into a learning experience that optimised the features and functionalities of tablets. The educational opportunities made possible by interactive eBooks are also cited.

According to Tees [17], the main barrier to eBook acceptance is difficulty reading from the screen. Other university research projects have also explored integrating eBooks into the curriculum from the library perspective. Ahmad and Brogan [18] studied academic eBook use and Glackin et al. [19] assessed the impact of eBooks and mobile devices on student learning. Czechowski et al. [20] surveyed eBook usage by a health sciences faculty and students and Biñas et al. [21] investigated the use of an interactive eBook to enhance students’ study experiences. No study appears to have investigated the use of an eBook as textbook in an ICT course.

### 2.2 Theoretical framework

The research of user acceptance of new technology has resulted in several models. The first was the theory of reasoned action [22] [23] and an extension was the theory of planned behaviour that specifies that attitudes and subjective norms influence behavioural intention, which in turn influences actual behaviour [24].

TAM/TAM2 is used extensively in the field of IS for explaining the acceptance of IT tools. Drawing heavily from the theory of reasoned action [22] [23], Davis et al. [25], in the technology acceptance model (TAM), identified and measured a set of generic beliefs that apply across a range of IT tools with two primary direct determinants of intention: ease of use and usefulness. TAM2, an extension to TAM, added subjective norm and voluntariness [26].

The diffusion of innovation (DOI) theory [27] states that decisions to adopt or reject an innovation are based on the beliefs users form about the innovation. The theory of Rogers [27] has been used to study a variety of innovations (e.g. World Wide Web, spreadsheets, and teaching methods).

Venkatesh et al. [28] reviewed and compared eight prominent models and formulated a unified model, named the Unified Theory of Acceptance and Use of Technology (UTAUT). This study made use of the UTAUT as this model provides suitable foundations to determine the attitudes of students towards the use of an eBook in an ICT course. UTAUT was developed with four core determinants of intention and four moderators of key relationships. The four determinants are performance expectancy, effort expectancy, social influence and facilitating conditions. Self-efficacy, anxiety and attitude towards using technology are the three moderators that are not direct determinants of Behavioural Intention. A discussion of the determinants follows below.

**Performance expectancy** is the degree to which an individual believes that using the system will help him/her to better his/her performance and therefore enhance the quality of his/her work [28]. Davis et al. [25] states that people form intentions towards behaviours they believe will increase their performance and further asserts that beliefs influence attitudes, which lead to intentions and therefore generate behaviours. In this study performance expectancy refers to the degree to which a student expects that using an eBook will improve his or her individual performance.

**Effort expectancy** is defined as the degree of ease associated with the use of the system [28]. Davis [25] refers to this as perceived ease of use and claims that it refers to the degree to which a person believes that using a particular system would be free of effort. People will more likely use an application that is
perceived easier to use than others and is more likely to be accepted by users. In this study effort expectancy refers to the degree to which a student regards an eBook as difficult to use.

Social influence refers to the extent to which a person experiences interpersonal influence to use a system from important people within his or her social milieu. In the pilot study [29] it emerged that social influence was not a determinant, since the students have very little choice but to use the eBook. The construct social influence was therefore not included in this study.

Facilitating conditions (Compatibility) is defined as “the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system” [28]. Rogers [27] defined Compatibility as “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters”. In this study facilitating conditions refers to the degree to which use of the eBook is supported and is compatible with students’ use of an ordinary textbook.

Self-efficacy. Psychologist Albert Bandura has defined self-efficacy as one’s belief in one’s ability to succeed in specific situations or accomplish a task. Self-efficacy will in this study refer to students’ belief in their ability to use an eBook.

Anxiety is a feeling of worry, nervousness, or unease about something with an uncertain outcome. In this study anxiety refers to the degree of stress and hesitance students experience with the use of the eBook.

Attitude towards using technology is defined as an individual’s overall affective reaction to using a system [28]. In this study attitude toward using technology refers to students’ positive or negative feelings about using the eBook as the course textbook.

Behavioural intention is the dependent variable in this study and refers to a student’s intention to use a specified eBook in the future, whether or not he or she used it currently. According to Ajzen [24] “Intentions are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour. As a general rule, the stronger the intention to engage in a behaviour, the more likely should be its performance”.

3. Research method

In this section the demographics of the participants will first be explained and then the research design, data collection and analysis are discussed.

3.1 Research design and participants

In this quantitative study, conducted at a university in South Africa, the participants were four groups of students, all taking a first-year ICT course. Four months after the eBook had been introduced, an announcement with the link to the anonymous online questionnaire was sent via the e-learning system to the 978 students taking the course. A total of 738 usable responses were received, indicating an overall response rate of 75.5%. Table 1 provides a summary of the biographic data.

<table>
<thead>
<tr>
<th>Table 1. Profile of respondents (n=738)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>IT as school subject</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Access to a computer since Grade 1</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Wireless Internet (Wi-Fi) access at home</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

Information Technology (IT) is a subject that can be taken from Grade 10 to Grade 12 in South African schools, focusing primarily on programming skills.

The gender profile is typical of most ICT classes with only 33.3% of the respondents being women. More than 80% of the group did not have prior knowledge of the subject by having taken IT as a school subject. These students are not your typical Net generation, since only 41.6% of them had access to a computer from a relatively young age. Moreover, only about half of the students have wireless Internet (Wi-Fi) access at home.

3.2 Data collection, instrument and analysis

The eBook was introduced for the first time in the previous academic year and a pilot study was conducted [29]. The questionnaire of the pilot study was adapted from Hardgrave et al. [30] and for this study the questionnaire from the pilot study was refined and further items from UTAUT [28] were added, resulting in a list of 33 questions.

Venkatesh et al. [28] and Hardgrave et al. [30] constructed questionnaires by using measurement scales from previous research and the six determinants of Behavioural Intention considered in this study are: Performance expectancy, Effort expectancy, Attitude towards using technology, Compatibility, Self-efficacy and Anxiety.

The first section of the questionnaire gathered information on the biographic data of the
respondents as shown in Table 1. The first 32 questions were accompanied by a five-point Likert response scale from 1 (Strongly disagree) to 5 (Strongly agree). In the last question the participants were asked: “I obtained a hard copy of the textbook (Yes/No)”.

The 738 responses were examined using the seven variables. A Cronbach's α coefficient was calculated for each of the 7 factors and it was found as Table 2 shows, to be reliable (α ≥ 0.60) for six of the seven factors. The Cronbach's α coefficient of the factor Self-efficacy (α = 0.58) was close to the norm for reliability and with further analysis it was found that the mean inter-item correlation of 0.257 falls in the range of 0.15-0.50 recommended by Clark and Watson [31].

Table 2. Factors* (with reliability coefficients)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Cronbach’s alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural Intention</td>
<td>0.837</td>
</tr>
<tr>
<td>Performance expectancy</td>
<td>0.873</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>0.836</td>
</tr>
<tr>
<td>Attitude towards using technology</td>
<td>0.872</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>0.704</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.580</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.717</td>
</tr>
</tbody>
</table>

Basic analysis of quantitative data was done by calculating the mean values and standard deviation of the factors and single variables. Four groupings were identified based on gender, IT as school subject, access to a computer since Grade 1 and Wi-Fi access at home. All the groupings were tested for significant differences between means in the different factors using T-tests. A Spearman rank correlation analysis was used to analyse the correlation between the dependent variable, namely Behavioural Intention and the independent variables Performance expectancy, Effort expectancy, Attitude towards using technology, Facilitating conditions, Self-efficacy and Anxiety. Since a convenience sample was used instead of a random sample, the p-values will be reported for the sake of completeness, but will not be interpreted.

4. Results

Table 3 shows that the students are relatively positive about the use of an eBook in their course. Not only does the factor Effort expectancy have the highest mean of all the factors indicating that they find the eBook rather easy to use and it does not require a lot of effort from their side, but also Anxiety has the lowest mean suggesting that they do not feel anxious when using the eBook.

When the second last item in Table 3 is considered, it is somewhat contradictory in relation to the positive attitudes towards the other factors, since a mean of 3.187 indicates that there is a slight inclination towards an old-fashioned textbook instead of an eBook. However, the standard deviation of 1.312 shows that the students have mixed feelings about whether they prefer a normal textbook instead of an eBook in this course.

One of the factors that played a role in the decision to use an eBook in this course was that the publisher could provide it at a lower cost. The cost of the eBook was consequently included in the course’s price. It is therefore rather shocking that despite the cost, 13.4% of the students still went ahead and obtained a hard copy of the rather costly textbook.

Table 3. Descriptive Statistics (n=738)

<table>
<thead>
<tr>
<th>Factors/Items</th>
<th>Mean*</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort expectancy</td>
<td>3.726</td>
<td>0.724</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.686</td>
<td>0.586</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>3.379</td>
<td>0.672</td>
</tr>
<tr>
<td>Performance expectancy</td>
<td>3.329</td>
<td>0.766</td>
</tr>
<tr>
<td>Attitude towards using technology</td>
<td>3.255</td>
<td>0.843</td>
</tr>
<tr>
<td>Behavioural intention</td>
<td>3.201</td>
<td>0.973</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.718</td>
<td>0.761</td>
</tr>
<tr>
<td>I would rather have used a normal textbook instead of an eBook in this course.</td>
<td>3.187</td>
<td>1.312</td>
</tr>
<tr>
<td>I obtained a hard copy of the textbook.</td>
<td>No-639 (86.6%)</td>
<td>Yes-99 (13.4%)</td>
</tr>
</tbody>
</table>

* Likert-style responses were ranked from 1 to 5 respectively.

The T-tests that were performed on the four groupings of gender, IT as school subject, access to a computer since Grade 1 and Wi-Fi access at home found no significant differences between means in the different factors. Therefore, neither the fact that 58.4% of the students did not have access to a computer right from the start of their school career, nor the fact that only 53.8% have Wi-Fi access at home caused them to have a significant different view on the use of an eBook as textbook. Moreover, gender and IT as a school subject did not result in a different view on the eBook usage.

Table 4 shows the results of a Spearman rank correlation analysis to examine the correlation between Behavioural intention and the other factors.
There is a large practically significant relationship between the students’ intention to use the eBook and three determinants of intention namely Performance expectancy; Attitude towards using technology; and Facilitating conditions. The strength of the influence of Attitude towards using technology was the highest. Therefore, the students’ positive feelings about using the eBook correlated the most with their intention to use the eBook. The students also expect to a high degree that using an eBook will improve their performance and therefore lead them to intend to use the eBook. Facilitating conditions also showed a large practical significant relationship indicating that students view the use of an eBook as consistent with their needs, past experiences with textbooks and existing values.

Table 4. Correlation with Behavioural Intention

<table>
<thead>
<tr>
<th>Factors</th>
<th>Correlation Coefficient</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude towards using technology</td>
<td>0.813**</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td>Performance expectancy</td>
<td>0.762**</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td>Facilitating conditions</td>
<td>0.674**</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td>Effort expectancy</td>
<td>0.422*</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.365*</td>
<td>p&lt;.001</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-0.159</td>
<td>p&lt;.001</td>
</tr>
</tbody>
</table>

* medium practical significant relationship  
** large practical significant relationship

The strength of the influence of Self-efficacy was the lowest among the five significant constructs indicating that students’ intentions to use the eBook correlated to a lesser extent to their belief in their ability to succeed in using the eBook. Anxiety is the only factor that shows a negative small practically significant relationship with Behavioural Intention, meaning that the degree to which the students experience anxiety when using an eBook did not have an effect on their intention to use the eBook.

5. Conclusions

This study investigated the use of an eBook in an ICT course. Drawing from the Unified Theory of Acceptance and Use of Technology (UTAUT) [28], six determinants of Behavioural Intention were empirically tested. Five of the six determinants were found significant (Attitude towards using technology; Performance expectancy; Facilitating conditions; Effort expectancy; Self-efficacy). Anxiety was not significant.

Universities and lecturers should take cognizance of the drivers of acceptance of an eBook and the likelihood of success for new technologies needs to be assessed. By understanding the determinants of students’ intention, universities can proactively design interventions, such as an orientation course at the start of the academic year in order to increase the likelihood of successfully deploying eBooks. All things considered, the so-called Digital Natives in this study appear to not have such a natural aptitude for new technologies. Universities (especially in developing countries) should carefully consider whether new technologies are beneficial to teaching and learning. This study cautions universities to not make assumptions about their students’ skills, attitudes and beliefs regarding technology.

6. References


Session 14: Global Issues In Education and Research

Evaluation of Distance Education Mediators: A Case Study of Inculcating Discipline and Quality of Study Centres  
(Author: Rucha Gujar)

Advancing Integrated STEM Education Using Engineering Design and 3D printing: Teachers & Researchers Advancing Integrated Lessons in STEM (TRAILS) NSF I-Test  
(Authors: Todd Kelley, Euisuk Sung)

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(Authors: Peter C. Lippman, Elizabeth Matthews)

Job Satisfaction, Organizational Commitment and Self-Esteem of Teachers in South Africa  
(Author: David P. Ngidi)

Working in a Hothouse? Educational Leadership in Times of Natural Disaster  
(Author: Barbara Perry)
Evaluation of Distance Education Mediators: A Case Study of Inculcating Discipline and Quality of Study Centres

Rucha Gujar
YCM Open University, Nashik, Maharashtra, India

Abstract

Universities in densely populated countries have to cater the education in many areas, at a time, to various target groups. Due to economy constraints, the universities cannot own campuses of all requirements, for all programmes. The ratio of growth of courses and availability of space and infrastructure are inverse. In such case, Universities in populated countries associates the study centres that are already developed with required infrastructures and human resources. These constraints generates the issue of indigenous and diversity. Though University generates and develop the programmes indigenously but have to cater diversely through the study centres which are not the indigenous structures of the university. Maintaining quality in such situation is the big challenge. Hence universities have to develop some parameters/indicators for the measurement of study centres. These should be related to the smooth working and delivery of the educational programmes. These indicators have to be linked to the activities of individuals making up the institutions and used to develop motivation to counsellors, coordinators and institution owners, to improve their performance and infrastructures. The efficient operation of mass education institutions is dependent on having access to appropriate performance indicators and on linking this body of information to a well-functioning evaluation. The present research paper is based on evaluation of documental proofs of infrastructures, human resource availability, authenticity and accountability regarding documents of the institution, previous enrolment and examination records. The School of Continuing Education of YCM Open University, Maharashtra India implements graduate programmes in Hospitality and Tourism Studies, Hospitality Studies and Catering Sciences and Media Graphics and Animation. Apart from this two masters degree programmes in hospitality Studies and food sciences are implemented. These programmes are implemented through various 67 study centres spread all over Maharashtra India. All study centres were invited physically to the head office for the evaluations. The documents and records were checked for various 15 indicators. The data collected through the documents, interviews and cross examinations is analysed. On the basis of data, the number of efficient, poor performing/ non-functioning study centres is segregated. The poor performing and non-functioning study centres are discontinued. The problems inherent in the system are identified and suggestions proposed for the improvement in the system. This exercise proved to be beneficial for the enhancement in the services from university to the study centres and from study centres to the students, by reducing the burden of excess work for providing services to non-functioning study centers.

1. Introduction

The Yashwantrao Chavan Maharashtra Open University (YCMOU) was established in July 1989 by Act XX- (1989) of the Maharashtra State Legislature. It is the Fifth Open University in the country. The YCMOU has been recognized under section 12 (B) of the University Grants Commission Act, 1956 of India. It is a member of various prestigious associations and bodies like the Association of Indian Universities (AIU), Association of Commonwealth Universities (ACU), Asian Association of Open Universities (AAOU), Commonwealth of Learning (COL), Canada to name a few. The main aim of the YCMOU is to become a Mass Varsity and to make available the education to the common man, educational programmes that are of practical use in his day-to-day life and those that provide better prospects for the future. The YCMOU has its headquarters at Nashik and provides support to its learners through study centres, which are spread all over the State of Maharashtra.

Mission of YCMOU, Maharashtra, India: Through our technical, vocational, professional and liberal education programmes, application of modern communication technologies and adoption of the distance education methodology, we strive towards developing an Innovative, Flexible and Open system of education.

Special features of Education provided by YCMOU, Maharashtra, India
- Emphasis on imparting vocational and technical skills.
- Use of Latest Information and Communication Technologies.
• Relaxed entry rules, flexibility in course combinations and credit transfer facilities.
• Extensive network of study centres.
• Scientific system of student evaluation.
• Special attention to Quality.
• Thrust on empirical Research.
• Recognition of our degrees and diplomas by other universities and professional bodies.

Based on the features mentioned above, YCMOU, India operates the education system through the extensive network of the study centres spread all over the Maharashtra India. The study centres are located in various cities and villages of Maharashtra. They operate as mediators and deliver the educational programmes of YCMOU University to the students, as per the guidelines of the YCMOU. The study centres are not the own campuses of the University but are recognised campuses for the delivery of YCMOU programmes. By the turn of the millennium almost every economically developed country understood the importance of measuring the performance of mass education with comparable indicators. These indicators have to be linked to the activities of individuals making up the institutions and used to develop motivation to counsellors, coordinators and institution owners, to improve their performance and infrastructures. The efficient operation of mass education institutions is contingent on having access to appropriate performance indicators and on linking this body of information to a well-functioning evaluation.

2. Methodology

The research paper is based on evaluation of infrastructures, human resource availability, authenticity and accountability regarding documents of the institution, previous enrolment and examination records. The School of Continuing Education of YCMOU implements graduate programmes in Hospitality and Tourism Studies, Hospitality Studies and Catering Sciences and Media Graphics and Animation. Apart from this two masters degree programmes in hospitality Studies and food sciences are implemented. These programmes are implemented through various 67 study centres spread all over Maharashtra India. All study centres were invited physically to the head office for the evaluations. The documents and records are checked for various 15 indicators. The data collected through the interviews and cross examinations is analysed. On the basis of data, the number of efficient, poor performing and non-functioning study centres is segregated. The problems inherent in the system are identified and suggestions proposed for the improvement in the system. This exercise proved to be beneficial for the enhancement in the services from university to the study centres, from study centres to the students. All 67 study centres were invited for the evaluation exercise but only 53 study centres attended the exercise. Among 53 study centres, 20 study centres were of B Sc Hospitality Studies and Catering Science Programme, 14 were of B Sc Hospitality and Tourism Studies, 7 were of B Sc Media Graphics and Animation programme, 5 were of M Sc Hospitality and Tourism Studies programme and 7 were of M Sc Food Science programme. This project had been carried out during Dec 2014 to April 2015. The collected data is mentioned in the following table:

First 2 parameters were about the personal information of the study centre based on name of institution, address of institution, attachment of previous recognition letters and the programme affiliated to the institute as a study centre of YCMOU. Among 67 study centres 53, i.e. 79% study centres attended the evaluation exercise. Following data is presented only for the study centres who attended the meeting/interview during stipulated time.

3. Discussion and findings

• The data mentioned in above table revealed that, 100% study centres those attended the interview, were aware about the application form, to be filled for the evaluation of their study centre.
• 96% study centres those attended interview have filled the complete information asked in various columns inside the application form. Some of them were found less aware about the relevant information to place at various places inside the application form hence discussed during the meeting and corrected it.
• 100% of study centres have updated their correspondence records and details in YCMOU from time to time. The study centres those who attended the meeting for evaluation interviews found to be punctual to update their correspondence records which enables YCMOU to send the various instructions from time to time.
• 100% study centres followed the proper and correct codes assigned to them by YCMOU. YCMOU provides unique codes to each and every study centre after recognition process. It becomes easier to trace the records of study centre regarding enrolment and examination on digital university portal of YCMOU.
• 96% study centres have paid the evaluation fees at scheduled time. 4% study centres paid the evaluation fees late.
• 72% study centres have not followed the format of infrastructure.YCMOU provides infrastructure requirement lists in a manual specially designed for the new study centres. This manual is available on the digital university portal of
### Table 1. Various Indicators

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Description of point</th>
<th>Number of SCs who have completed formality</th>
<th>Percentage</th>
<th>Number of SCs who have not completed formality</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have the study centres used the proper format of application?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>Has the information been filled properly and completely in application?</td>
<td>51</td>
<td>96%</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>3</td>
<td>Have the name and address of the study centre been updated in the records of YCMOU?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Has the study centre code been followed by the study centre, provided by YCMOU?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>Has the study centre paid an evaluation fee to YCMOU?</td>
<td>51</td>
<td>96%</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>6</td>
<td>Has the format of infrastructure been followed by the study centre?</td>
<td>15</td>
<td>28%</td>
<td>38</td>
<td>72%</td>
</tr>
<tr>
<td>7</td>
<td>Have the course wise teachers been mentioned in an application form in concerned column?</td>
<td>9</td>
<td>17%</td>
<td>44</td>
<td>83%</td>
</tr>
<tr>
<td>8</td>
<td>Have the study centre provided sufficient infrastructure for proper delivery of the YCMOU programme?</td>
<td>46</td>
<td>87%</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>9</td>
<td>Is the number of teachers sufficient at the study centre for implementing the academic programme of YCMOU?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>10</td>
<td>Have the YCMOU biodata format been used to provide the information of teachers?</td>
<td>30</td>
<td>57%</td>
<td>23</td>
<td>43%</td>
</tr>
<tr>
<td>11</td>
<td>Have the supporting documents been attached with the biodata of teachers, to prove the eligibilities?</td>
<td>28</td>
<td>53%</td>
<td>25</td>
<td>47%</td>
</tr>
<tr>
<td>12</td>
<td>Have the previous enrolment records been provided by study centres?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>13</td>
<td>Have the previous examination records been provided by study centres?</td>
<td>53</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

YCMOU. For evaluation procedure it was expected that each and every study centre.

- must follow the same lists to be pasted inside the application form and only quantities should be mentioned by study centres. As many of the present study centres have prepared infrastructure list on their own and not followed the instruction, all those are instructed to refill the application.
- 83% of study centres have not provided course wise teachers. Hospitality, catering science, tourism, food science programmes are mainly professional programmes. Study centre requires appropriate discipline wise teachers for the implementation of programme. Most of the study centres provide this information in very casual and hazy way. YCMOU cannot check the availability of teachers in objectively if the data is provided like this. Hence course wise data of teachers is asked through the evaluation application. Through data, it was found that majority have not provided as expected. Hence the study centres were guided individually in an evaluation meeting and the fruitful exercise was carried out.
- 87% of study centres have sufficient and appropriate infrastructure required for implementation of programme though they have not followed the appropriate proforma. During interviews, it was found that the study centres were conducting the practical sessions and theory sessions properly which requires the proper infrastructure. This made clear that though they were having the sufficient infrastructure, just due to unawareness they could not place the information in right format. Counselling through interview made them aware and they fulfilled the correct information at right places.
- 100% of the study centres have appropriate quantity of teachers but they were less punctual to put in a course wise format. After counselling in an interview the study centres corrected the information objectively in an application.
- 57% of the study centres have used the proper biodata format for providing the information of teachers. 43% study centres have provided biodata in their own formats in general at the time of interview but later on they have also provide the information in correct formats.
53% of the study centre has provided the proofs of eligibilities and the relevant qualifications in concern with the programme. 47% study centres provided this information later on within provided time.

100% study centres those attended interviews have provided previous enrolment records of the students. This data revealed that these 53 study centres were continuously functioning.

100% study centres those attended interviews have provided previous examination records of the students. This data revealed that, these 53 study centres were continuously functioning and providing services to the students.

4. Recommendations

Those 14 study centres should be stopped for enrolling new admissions in 2015-16 academic years. This activity identified the study centres those were not punctual in attending the evaluation procedure. 2 study centres that were really interested in doing this evaluation exercise but due to their own difficulties could not, have done the procedure later on.

5. Conclusion

YCMOU Study centre evaluation procedure found to be very fruitful and effective procedure to make the study centres accountable and answerable to the YCMOU University. Updating proper records, provision of proper infrastructures and appropriate well qualified human resource, forced study centres to remain updated with all requirements for qualitative delivery of programme to the students. Scrutiny of enrolment records and examination records proved the continuity in functioning of the study centres. The overburdened correspondence with non-functioning study centres for various purposes on YCMOU system have been cut down. Naturally, this offloading leads to focus and concentrate for providing efficient and timely response to study centres by YCMOU. Study centre evaluation procedure inculcated the enhancement in discipline and quality of study centres of the mentioned programme.

6. References


Advancing Integrated STEM Education Using Engineering Design and 3D printing: Teachers & Researchers Advancing Integrated Lessons in STEM (TRAILS) NSF I-Test

Todd Kelley, Euisuk Sung
Purdue University

1. Scope

TRAILS (Teachers and Researchers Advancing Integrated Lessons in STEM) is a NSF I-TEST grant project to create a model of integrated STEM instruction and teacher professional development to enhance high school student learning of STEM content. TRAILS seeks to increase STEM self-efficacy within science and technology teachers and advance students’ learning of STEM content at schools in rural settings.

The TRAILS approach uses engineering design as a STEM subject integrator, providing an authentic learning context to promote 21st century skills and motivate students to pursue STEM careers. The TRAILS model blends scientific inquiry and engineering design to teach common STEM practices and STEM habits of mind. TRAILS leverages the use of innovative tools such as 3D printing, 3D scanning technology, and CAD software allowing students to design and test innovative design solutions.

TRAILS uses an exemplar STEM lesson called D-BAIT that provides a platform for teaching the science of entomology within engineering design. High school students design biomimicry-inspired fishing lures that mimics the characteristics of prey insects by using CAD software and 3D printing technology to test prototyped design solutions.

TRAILS uses a quasi-experimental research design (Ary, Jacobs, Sorensen, & Walker, 2009; Creswell, 2009); teacher participants were assessed on pre- and post-test results to determine significantly different in preexisting STEM content knowledge, self-efficacy, and motivation in teaching STEM content.

Student participants in both a treatment group and comparison group were pretested followed by a posttest during the academic year to measure changes in student STEM content knowledge, student self-efficacy in learning STEM knowledge, and changes in STEM career interest. This data on students was statistically analyzed using t-tests to determine significant differences in the TRAILS treatment group and TRAILS comparison groups.

2. Objective and Motivation

The vision of the TRAILS project is 1) to provide science and technology teachers with integrated STEM professional development experiences and 2) engage teachers with a local community of STEM practice providing sustained and substantial STEM pedagogical content knowledge growth. Additionally, 3) teachers learn how to use advance innovation tools such as parametric modeling software, 3D printers and scanners to enhance science and technology lessons. Partnering science and technology teachers will cogenerate integrated STEM lessons based upon an exemplar lesson example D-Bait and infuse science inquiry and engineering design to enhance instruction. TRAILS lessons are designed to develop 21st century skills including: creativity, critical thinking, collaboration, communication, and computational thinking as they work to solve engineering design challenges and engage in science inquiry investigations. TRAILS researchers will provide preliminary findings from this research project to share with the greater STEM education community regarding preparing teachers to teach integrated STEM lessons and enhance student learning of STEM content while promoting STEM careers. TRAILS initial student and teacher data and research findings will be presented as well as student 3D printed prototypes design solutions.
Children’s Development of Self Within the Context of the Early Childhood Classroom: A Case Study

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Abstract

The built environment of childhood institutional settings is frequently viewed as backdrop for social processes to take place. However, the affordances and constraints of the physical setting can profoundly shape the course of children’s development and emerging sense of self. In fact, it is often aspects of the built environment such as noise, crowding, lighting and layout that shape social interaction, behavior and sense of self. Given this, the theories and evidence supporting the relationship between the physical setting and children’s development of self-concept will be explored. Drawing upon psychological theories, education, and architecture, a framework is provided for conceptualizing how children’s evolving understanding of themselves as learners, participants and agents within their world is influenced by their physical surroundings. In order to fully illustrate these concepts a case study of how classroom design can influence sense of self is provided.

1. Introduction

Each year, an increasing number of young children begin their first school experience in Early Childhood Education (ECE). The benefits of quality education for our youngest citizens are hard to dispute. On an economic level, it is proposed that for each dollar invested in developing quality programs for young learners, the greater societal benefits are three-fold [1]. Early Childhood Education has been touted as the panacea for poverty, illiteracy and lack of social mobility. With decades of research to support these positive child outcomes, nations around the globe have implemented policies to improve quality and access [2]. Targeted measures for ECE improvement have primarily centered on the social and educational components of early childhood centers. While these are critically important, the attention to the physical settings of schools is often not prioritized. This is unfortunate since nearly five decades of research has shown clear evidence that the physical parameters of the built environment can directly and indirectly impact children’s development including reading comprehension, social/emotional development and overall learning behavior [3].

Neglecting the physical setting of schools can have significant consequences. Poorly designed and ill-equipped schools may pose obstacles for teachers and students and work against planned learning activities. In addition to these direct impacts, the built setting also influences learning indirectly through shaping self-concept. When children learn in an optimal environment, the physical setting—such as light, materials, and the spatial design serve to promote cultural messages regarding the child’s worth as a student and person. Likewise, if the setting is broken down with inadequate materials or an unsafe setting, the message conveyed to the child is one of lacking or threat. This sense of self can impact how the child sees him/herself as a learner and may negatively impact learning engagement.

In this paper, we briefly review the development of children’s self-concept and explore the concept of place attachment as part of the process in the development of self identity. We also present a school design case study to illustrate how the physical setting can affect children’s sense of self.

2. Self Identity and Self Concept

From the ages of 3-6, young children undergo significant biological, physiological, cognitive, social/emotional, and linguistic development. Early childhood educators are concerned with all developmental domains and with ensuring that children are learning, growing physically, developing self regulation and are gaining competence with social skills. One area of particular importance during these early formative years is the development of self-identity and self –concept [4].

Identity development, in large part, stems from the individuals’ experiences in their learning environments [4]. These experiences of sharing thoughts, working through the tasks, and mastering skills, transform each individual’s personal history...
During their earliest years, children are developing a sense of who they are as individuals. They begin to gain this sense through an understanding of their own abilities, views, characteristics and attributes. This emerging understanding of the self-concept evolves as youngsters increase their language development, engage in social interactions and receive feedback from others as they transact within their physical environments.

3. Place Attachment and Place Identity: The Relationship Between Physical Space and Self Concept

The connection between self-concept and physical space can be best understood by acknowledging two points: 1) people have the ability to form emotional connections with their built environment and 2) that physical space can afford or constrain experiences that shape how individuals view themselves. In order to understand these points more fully, the constructions of Place Attachment and Place Identity are quite useful.

Place Attachment describes the emotional connection between the individual and the physical environment. Early experiences within our physical settings (often the home environment) embed within the subconscious. Over time, repeated experiences with specific places enable the development of feelings of affinity with our environment. [7]

There are several different views of the specific mechanisms by which children develop an attachment to their environment. Louis Chawla drew upon Bowlby’s psychoanalytic framework to conceptualize how attachments develop between children and their environmental space [8]. Utilizing Bowlby’s attachment model, she proposed that attachment to the physical setting occurs somewhat sequentially as the child develops [9]. For example, as an infant, exploration is largely limited by the child’s developmental immaturity —thus, a child first explores the world in a limited fashion, usually from the perspective (and under the affordances or constraints) of his /her caregivers. As the child continues to develop physically and emotionally, s/he gains greater independence and access to the physical setting [8].

According to Bowlby’s model, the onus is on the parent to provide responsive caregiving to the child’s needs—through this continual responsivity the child develops trust in adults and a sense of his/her own worth. Although the built environment is not a living and breathing being who can respond to the child’s cues and needs, there is still a sense of the environment as “provider”. The child’s perceptions of the environment as meeting his/her needs for safety and security can be considered to contribute to what Bowlby proposed was an “Internal Working Model” of the world.

Although unable to articulate the specific manner in which the environment affects them, children perceive the environment as safe, threatening, powerful or vulnerable. Even very young children, around preschool aged (3-5) possess an understanding of their connection to place and environment [8]. They also begin to understand their emotions and feelings about their space. Heidegger proposed a similar understanding of the affinity and relationship between person and environment known as “dwelling thinking”. The concept of “dwelling” refers to not only living within a space, but how we actively construct our sense of belonging within a physical realm [9] by acting on the space, and changing the space to better suit our needs and interests. This connectedness that develops through these actions helps to foster an emotional relationship to the environment that in turn becomes a reflection of the self. Cooper Marcus drew upon the psychoanalytic domain to present a framework of how the physicality of the home is reflected onto both the conscious and unconscious beliefs about self. The outward exterior of the home, viewed by all sent a message to the world about the person [10]. When the environment is substandard, significant harm to self-concept may occur. Sociologist Lee Rainwater depicted this reflection of self in the physical setting in his 1970 work, writing that “The physical evidence of trash, poor plumbing and stink…rats and vermin deepens their feeling of being moral outcasts. Their physical world is telling them that they are inferior.” [11] (Pg. 29).

Engagement with the built environment leads not only the development of self-awareness, but also social awareness. As each child is developing an identity of him/herself, s/he also recognizing, the emerging identities of peers. Hence, self-awareness and social awareness are embedded and co-constructed with others within interactions and within place.

As the child is developing self-awareness, and social awareness, s/he is also developing Place-Identity. Place Identity is the individual’s incorporation of place into the larger concept of self [7] Physical settings include the resources, tools, and materials that are available to support specific actions, motivations and operations. When using these place specific tools, the child cultivates a sense of Place Identity. This evolution permits the child to view him/herself distinct from, yet related to the built environment. Since Place Identity is rooted in the experiences that the child has in the built environment, the evolution of self must be understood as a shared set of ideas about and relationship to the physical setting of the classroom.

Our physical environment, despite being inanimate, can shape our self-concept and identity.
More than a mere backdrop for social behaviors, the environment exerts its own direct and indirect influence on our behaviors. This is particularly evident when we consider the fairly robust literature on the impact of disruption on our living space. Those who have experienced the loss of a home, a home invasion or natural disaster often report significant negative impacts on their emotional well-being as they may no longer view their environment as a place of security and safety.

4. Classroom Design and Quality: Contributions to the Development of Self

The majority of research on the critical importance of place attachment to children’s sense of security and development of self, has been predominately focused on the home environment. This focus is undeniably important since, for many children the most critical environment is that of the home. However, while many infants and very young children may spend the majority of their waking hours at home, many spend 6 or more hours per day in early childhood settings [3].

The evidence on the benefits of high quality early childhood education on children’s development and well-being, has been well established. High quality environments usually include a well trained professional staff of teachers, developmentally appropriate and culturally sensitive curriculum and a well maintained and safe physical space. When considering the aspects of the built environments of schools that most contribute to healthy child development outcomes, there is strong support for classrooms with limited outside/ambient noise, appropriate amounts of space, access to natural light and the ability of the teacher to visually and easily access the child, regardless of where s/he is situated in the classroom [3] [12].

The presence of these parameters has been shown to directly and indirectly impact children’s development and learning. Young children benefit physically, cognitively and emotionally from an environment that affords optimal learning. Furthermore, teachers are better able to respond to children’s learning needs when the environment is supportive [13]. Moreover, classroom environments that meet the child’s need for safety and security may also contribute to the development of the child’s sense of self. As children come to engage in changing and acting on their space, they further develop attachment to the classroom and are in turn influenced by the physical setting.

5. Case Example: Holy Cross College Early Learning Center

This case study examines the classroom design for Holy Cross College’s (HCC) Early Learning Center (ELC) in Perth, Australia in order to illustrate how classroom arrangements can support children’s emerging self-concept. This project was grounded in Evidence Based Design, rather than the typical normative theories/notions about space that have traditionally informed school design. These are generally not based in research but in general trends and fads.

The new design layout for the Holy Cross College Early Learning Center was modeled largely on the literature on situated learning theory, while research on children’s participation guided the development and integration of key design features in order to support the developing self-concept of the child.

The design of this space was based upon an important premise that learning is neither passive nor does it occur individually, but rather is socially constructed [14]. Learning happens as individuals are engaged in social activities. Situated learning theory, like place attachment, recognizes that learning is embedded in social and physical contexts. Hence, the built environment must be crafted to actuate learning and engage learners [15]. Additionally, situated learning theory acknowledges that the learners’ transactions are not arbitrary, but rather, are shaped by purposefully designed settings. Since place attachment situates learning in context and acknowledges the reciprocal relationship that occurs between behavior and experiences, the transformations of the learners’ cognitive and social-emotional processes are largely guided by their transactions with their learning environments [5].

With this understanding, a concerted effort was made to craft the school design specifically to support specific actions and operations for the learners.

In order to achieve this, the design for the classrooms was created to be responsive to the children’s activities. Unlike, the designs of many schools, that are populated with built-in cabinets and a presentation area for the teacher, the approach for HHC employed the research on the best practices for spatial design of classrooms. If HCC had incorporated the typical standard school design patterns, 16 square meters of storage space for built-in cabinetry and 14 square meters of space for the teachers’ desk area, as well as 30 square meters of floor area would have been lost, leaving roughly 1 square meter of work space for each child in a 60 square meter classroom. Utilizing this standard design pattern could significantly limit students in their formal and informal transactions during the school day.
In order to avoid these pitfalls, the HCC ELC’s classrooms were fashioned with an eye to preserving space and enabling children to use space to suit their needs. Specifically, teachers’ desks were eliminated from the classrooms to create more usable space. Moveable furniture and cabinetry was installed, to enable the creation of multiple learning zones that would support the variety of transactions necessary for the development of the whole child.

Given that young children are learning how to communicate, share and negotiate with others, the classrooms were planned to support these important aspects of their social-emotional development. Building on the research on activity settings, the focus was on the creation of differentiated learning zones where children were encouraged to work independently and cooperatively. To better afford these opportunities, a combination of built-in elements and moveable furniture along with equipment were featured in each room.

This design feature was notable for a number of reasons. Not only were teachers capable of arranging their rooms to support the different learning zones, but more importantly, the children were encouraged to move furniture in the rooms—thus actively constructing the space to suit their needs and developing connectedness and a sense of themselves as active agents in the learning community. While the built-in furniture, tables with chairs, and cabinets on wheels were used by teachers to define specific areas for learning, at the same time, the moveable furniture, (light weight stools and ottomans on wheels), empowered the children to arrange and re-arrange their work areas to engage or disengage with others and/or create safe and secure places to learn (See Figure 1).

Built-in cabinetry approximately 500mm high was installed under windows and along one corner of the classrooms. The cabinetry defined a learning zone for storing reading materials and blocks. Not only could the young child find materials stored in the cabinetry, but they could also stand next to, sit on, and sit beside the cabinetry working on the task at hand, talking with others, and/or simply gazing out the window to enjoy the view.

Another feature used to further differentiate the learning zone included stainless steel trough sinks. While these sinks could be used for washing hands and plates, they also created an area where artwork would take place. The built-in cabinetry and sinks also helped to better define the learning zones.

To support children’s ability to shape the space, vertical writing surfaces were introduced in two classroom areas so that children could draw and essentially transform their space. In these places, idea paint was applied to the walls to create full height vertical writing surfaces from 100 mm above the finished floor to a height of 2400 mm. Doing so, afforded all learners the opportunity to access and display their work. With this application, no matter how tall a child was, they could comfortably go to the wall and share their knowledge and thoughts.

By using furniture, equipment and wall surfaces to provide cues for how the spaces would be used, classrooms were understood as places that must function to support the variety of activities that occur within them. Classrooms are not conceptually derived spaces but must be viewed as places that needed to support the needs of approximately 30 learners. Accordingly, each room was planned with six distinct learning zones—a block corner, a painting corner; an area for creative play, reading corner; science area, and building area (See Figure 2).

These learning zones are activity settings where the child is encouraged to participate with others to achieve social and learning goals. These spaces provide opportunities for hypothesizing, testing ideas, evaluating results and creating strategies for solving the task-at-hand. The experiences of working with others, sharing ideas, and mastering skills all
work to transform the child and his/her sense of self and understanding of what s/he can achieve. [5] [6]. Since children’s identities evolve in the practice of learning, when spending time in a supportive environment they are better able to successfully explore and succeed at mastering skills. Over time, consistently experiencing success in learning activities helps to forms the foundation of their self-concept and self-identity.

By creating activity settings, distinct and specific learning zones in the built environment, located along walls and in corners, teachers provide opportunities for learners to develop their sense of self, of others and place. Furthermore, they are afforded the opportunity to identify settings in the classroom where they can belong. In situations where children do not feel comfortable, they can in essence shape their physical space to afford a sense of security. Hence, appropriating an identify is ongoing process that is guided in part by the physical setting.

The efficacy of the HCC ELC design changes was assessed in part with informal teacher interviews. These interviews were conducted in 2014, one year after the completion of the school. The individuals interviewed included the principal, the director of the primary school, and six of the nine teachers who work in the ELC. Based on interviews and observations, the spaces provided the children opportunities to develop sense of self, social awareness, Place Identity and place attachment. Comments from the interviews indicated that the newly designed classrooms:

1). Provided appropriate cues encouraging children (and teachers) to craft activity settings that supported pedagogical goals, interests, and needs.

2). Afforded the needed space/room for creating a more flexible learning environment. For example, having a variety of furniture provided them with the tools to support independent and small group work. The stools, chairs, cabinets on wheels, and ottomans with wheels could be easily moved across the classroom, and rearranged to support intended transactions of the activity settings. Consequently, the spatial parameters of any given learning area could extend or contract depending on who was using these learning zones.

3). Empowered the students to rearrange their space to support different transactions. Children used furniture as barriers so that they could work comfortably and securely away from the activities of others.

4). Children could move between spaces. While they might begin an activity on the floor, when needed to they could easily move to a table or built-in cabinet to continue working without disrupting others. This access to resources to complete operations offered a more fluid leaning environment and reduced anxiety of students.

5). Given that the spaces offered a variety of built-in and fixed cabinetry, children had a choice of how and where they wanted to learn, sitting in a chair at tables, on the cabinetry, on the floor, or under a table.

This case study illustrated how open classrooms with a balance of built-in elements and moveable furniture can serve as dynamic spaces for children’s learning and development of sense of self. The physical changes made to the classroom in this case study helped to shape and positively alter students’ learning behaviors, social interactions and teacher’s behaviors within the space. By carefully designing the environment to afford children the opportunities for engagement and learning mastery, and avoiding elements that work against learning behaviors, we are able to create spaces that support the development of positive place attachment and self-identity.

6. Conclusion

Efforts to enhance the quality of early learning environments are a priority for most nations around the world. Traditionally these efforts are focused on initiatives to improve curriculum, teacher training and student ratios with the goal of improving cognitive and learning skills in young children. Little attention has been focused on aspects of the built environment of the classroom and how these parameters affect the behaviors and interactions of students within the classroom. Moreover, there is even less attention paid to understanding how children’s self concept and identities as learners are shaped by the physical settings that they spend time within. The physical setting does have a unique influence over how children see themselves.

Designing early childhood classrooms to best support children’s emerging sense of self can positively impact learning where the young child see challenges and values education. Greater understanding of children’s place attachment in the early childhood years is needed along with more systematic efforts to apply evidenced-based design approaches in the early childhood classroom.

7. References


Job Satisfaction, Organizational Commitment and Self-Esteem of Teachers in South Africa

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Central University of Technology, South Africa

Abstract

This study examined Job Satisfaction, Organizational Commitment and Self-esteem of teachers in South Africa. Job Satisfaction Survey (JSS) was used to measure job satisfaction. Organizational Commitment Scale (OCS) was used to measure organizational commitment. Rosenberg Self-Esteem Scale (RSES) was used to measure self-esteem. Pearson product moment correlation coefficient revealed a significant positive relationship between JSS variables (pay, supervision, co-workers, nature of work, communication) and OCS normative commitment variable. Significant positive relationship was also established between job satisfaction and self-esteem as well as between JSS variables (co-workers, nature of work, communication) and self-esteem. Stepwise regression analysis indicated that JSS variable (communication) emerged as a significant predictor of the OCS normative commitment as well as for the OCS affective commitment. Teaching level emerged as the only biographical variable that is a significant predictor of the OCS continuance commitment.

1. Introduction

Job satisfaction, organizational commitment and self-esteem of employees are important factors to be considered by employers in any organization. Research indicates that satisfied employees tend to be committed to an organization and that employees who are satisfied and committed are more likely to attend work, stay with an organization, arrive at work on time, perform and behave well [1], [20]. Teachers who have a high level of self-esteem manifest themselves in the classroom as confident, relaxed and have a respectful attitude towards students [12]. Few studies have been conducted to investigate job satisfaction, organizational commitment and self-esteem relationship to test these variables together. The present research intends to do that.

2. Literature review

Job satisfaction refers to the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs [32]. Organizational commitment on the other hand, refers to the level to which an employee is faithful to his/her organization [3], [34], [18]. Organizational commitment consists of affective, continuance, and normative commitment [4], [24], [25]. Affective commitment refers to the extent to which an individual identifies with the organization (employees remain with the organization because they want to). Continuance commitment refers to an individual’s need to continue working for the organization (employees remain because they need to). Normative commitment refers to the extent to which an individual believes he/she should be committed to the organization based on the perceived costs associated with leaving (employees remain because they feel they ought to) [4], [24], [25], [6]. Self-esteem refers to the overall value that one places on oneself as a person. It reflects a person’s overall evaluation of his or her own worth [2].

Research has been conducted in other countries on the relationship between job satisfaction and organizational commitment of different occupational groups, including school teachers [11], [31], [28], [35]. These studies indicate that there is a significant relationship between job satisfaction and organizational commitment. Studies conducted among high school teachers [4] in South Africa have also found evidence of the positive relationship between organizational commitment and job satisfaction.

Several studies have been conducted in other countries on the relationship between job satisfaction and self-esteem of different occupational groups, including school teachers [36], [5], [37], [7]. These studies established that there is a strong relationship between job satisfaction and self-esteem.
Various studies have also been conducted in other countries on the relationship between organizational commitment and self-esteem of different work groups including school teachers [17]. These studies couldn’t find a positive correlation between organizational commitment and self-esteem.

Few studies have been conducted to investigate job satisfaction, organizational commitment and self-esteem relationship. A study by [12] revealed that teachers’ self-esteem, job satisfaction and organizational commitment were mutually related.

3. Research Rationale

Although studies have been conducted on job satisfaction, organizational commitment and self-esteem in other countries, very few, if any, studies have attempted to investigate their relationships on school teachers in the South African context. The present study intends to do that. More specifically, the present study attempts to find answers to the following research questions:

- Is there any relationship between job satisfaction and organizational commitment of school teachers?
- Is there any relationship between job satisfaction and self-esteem of school teachers?
- Is there any relationship between organizational commitment and self-esteem of school teachers?
- Do school teachers’ job satisfaction, self-esteem and biographical variables (gender, teaching experience and teaching level) predict organizational commitment?

4. Methodology

4.1. Aims of study

The present study aimed at achieving the following objectives:

- To determine whether there is any relationship between job satisfaction and organizational commitment of school teachers.
- To determine whether there is any relationship between job satisfaction and self-esteem of school teachers.
- To determine whether there is any relationship between organizational commitment and self-esteem of school teachers.
- To determine whether school teachers’ job satisfaction, self-esteem and biographical variables (gender, teaching experience and teaching level) predict organizational commitment.

4.2. Hypotheses

The following theoretical hypotheses were formulated:

1. There is no relationship between job satisfaction and organizational commitment of school teachers.
2. There is no relationship between job satisfaction and self-esteem of teachers.
3. There is no relationship between organizational commitment and self-esteem of school teachers.
4. School teachers’ job satisfaction, self-esteem and biographical variables (gender, teaching experience and teaching level) do not predict organizational commitment.

4.3. Participants

Participants for this study were drawn from a population of teachers in schools located under Motheo district of the Free State province in South Africa. A list of schools in the district was obtained. At the time of investigation, there were three hundred and twenty-two schools in Motheo district. Ten schools were randomly selected, from which the sample of teachers for this study was drawn. Participants volunteered to participate in the study (Table 1).

Table 1: Distribution of participants according to biographical variables (N=100)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Teaching experience: Teaching level in years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30 70 32 19 49 40 60 Primary Secondary</td>
</tr>
</tbody>
</table>

Table 1 illustrates the distribution of participants in accordance with their biographical variables, namely gender, teaching experience and teaching level. Out of 200 questionnaires that were distributed, 100 were returned, which is a 50% return rate.
4.4. Measures

The questionnaire was used as a research instrument to collect data. The questionnaire was appropriate for eliciting and rating participants’ responses as well as for quantitative analysis of data. The questionnaire consisted of the Job Satisfaction Survey (JSS) [32], Organizational Commitment Scale (OCS) [27] and the Rosenberg’s Self-Esteem Scale (RSES) [30]. The other section (first section) included in the present study consisted of school teachers’ biographical information, namely gender, teaching experience and teaching level.

Job Satisfaction Survey (JSS)

Job Satisfaction Survey (JSS) was used to measure job satisfaction of school teachers. The JSS is a 36 item nine facet scale to assess employee attitudes about the job and aspects of the job. Each of the subscales consists of four items. The overall job satisfaction score is computed by summing all 36 items. The items are presented as statements and are evaluated by marking the alternative that seems closest.

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The internal consistency reliability coefficient alpha for the total scale is 0.91 [32]. The use of JSS has been extended to the Republic of South Africa [20]. These researchers established in their sample that internal consistency reliability, measured by Cronbach’s alpha was: 0.79 (pay); 0.78 (promotion); 0.89 (supervision); 0.72 (fringe benefits); 0.76 (contingent rewards); 0.48 (operating conditions); 0.58 (coworkers); 0.70 (nature of work) and 0.72 (communication) and 0.92 for the total scale. The internal consistency reliability for [29] study, measured by Cronbach’s alpha was: 0.81 (pay); 0.73 (promotion); 0.65 (supervision); 0.79 (fringe benefits); 0.81 (contingent rewards); 0.38 (operating conditions); 0.71 (co-workers); 0.76 (nature of work); 0.70 (communication) and 0.90 for the total scale.

Organizational Commitment Scale (OCS)

Organizational Commitment Scale (OCS) was used as an instrument to measure organizational commitment. This scale comprises 18 items, six for each of the three commitment components (Affective, Normative and Continuance Commitment). Items were scored on a 7-point scale ranging from strongly agree (7) to strongly disagree (1). Scoring for negatively worded statements is reversed. The authors [29] reported internal consistency reliability Cronbach’s alpha estimates for affective commitment (0.82), continuance (0.74) and normative (0.83). The use of OCS has been extended to the Republic of South Africa [13], [15], [21], [20]. They [20] established in their sample that internal consistency reliability, measured by Cronbach’s alpha was 0.79 for affective commitment, 0.68 for continuance commitment, and 0.82 for normative commitment. The internal consistency reliability for [29] study, measured by Cronbach’s alpha was 0.61 for affective commitment, 0.79 for continuance commitment, and 0.75 for normative commitment.

Rosenberg’s Self-Esteem Scale (RSES)

Rosenberg’s Self-Esteem Scale (RSES) was used to measure self-esteem. The RSES is a 10-item self-report measure of self-esteem based upon satisfaction of one’s self and life.

The instrument consists of five positive items and five negative items. Each item is answered on a four point Likert scale ranging from "strongly disagree" to "strongly agree". A score of 3 is assigned to "strongly agree" and 0 to "strongly disagree" for the positive items. The scoring is reversed for negative items by assigning a score of 0 to "strongly agree" and 3 to "strongly disagree". The internal consistency reliability in the other study [12], using Cronbach alpha coefficient was 0.81. The use of RSES has been extended to the Republic of South Africa [22]. They [22] established in their sample that internal consistency reliability, measured by Cronbach’s alpha was 0.98. The internal consistency reliability for [29] study, measured by Cronbach’s alpha was 0.81.
5. Procedures

The researcher personally administered the questionnaires to the participants. An explanation of nature of the questionnaire and the purpose of the investigation preceded the administration. In order to achieve the aims of this study, various inferential statistical procedures were followed. The Pearson product moment correlation coefficient (r) was used to determine whether there is any relationship between teachers’ job satisfaction and organizational commitment, job satisfaction and self-esteem, organizational commitment and self-esteem. The Pearson product moment correlation coefficient (r) is appropriate for parametric measure of association [9].

Stepwise multiple regression analysis was used to determine whether teachers’ job satisfaction, self-esteem and biographical variables (gender, teaching experience and teaching level) predict organizational commitment or not. Stepwise multiple regression analysis is typically used to determine independent variables that are useful in predicting the dependent variable. The SPSS computer programme searches for the order in which the best predictor variables (independent variables) are to be entered into the regression analysis. Hence, in regression there are several variables on one side of the equation and one variable (dependent variable) on the other side [10], [33], [8].

6. Results

The results of analysis for the first aim show the correlation coefficients of job satisfaction and organizational commitment (Table 2). According to Table 2, significant positive relationship was observed between the five JSS variables, namely pay ($r=0.21$, $p<0.05$), supervision ($r=0.25$, $p<0.05$), co-workers ($r=0.22$, $p<0.05$), nature of work ($r=0.27$, $p<0.01$), communication ($r=0.28$, $p<0.01$) and OCS normative commitment variable. Significant negative relationship was observed between JSS communication variable and OCS affective commitment variable ($r=-0.24$, $p<0.01$). No significant relationships were observed between OCS continuance commitment and all JSS variables.

Table 2: Significant correlations between job satisfaction and organizational commitment

<table>
<thead>
<tr>
<th>Job Satisfaction Scale</th>
<th>Normative commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay</td>
<td>0.21*</td>
</tr>
<tr>
<td>Supervision</td>
<td>0.25*</td>
</tr>
<tr>
<td>Co-workers</td>
<td>0.22*</td>
</tr>
<tr>
<td>Nature of work</td>
<td>0.27**</td>
</tr>
<tr>
<td>Communication</td>
<td>0.28**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Satisfaction Scale</th>
<th>Affective commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>-0.24*</td>
</tr>
</tbody>
</table>

**$p<0.01$; *$p<0.5$**

The results of analysis for the second aim show the correlation coefficients of job satisfaction and self-esteem variables (Table 3). Significant correlation was found between total job satisfaction and self-esteem ($r=0.26$, $p<0.01$). Significant positive relationship was observed between the three JSS variables, namely co-workers ($r=0.32$, $p<0.01$), nature of work ($r=0.29$, $p<0.01$), communication ($r=0.28$, $p<0.01$) and self-esteem.

Table 3: Significant correlations between Job Satisfaction and Self-Esteem

<table>
<thead>
<tr>
<th>JSS</th>
<th>Self-esteem Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.26**</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Job Satisfaction Scale</th>
<th>Self-Esteem Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-workers</td>
<td>0.32**</td>
</tr>
<tr>
<td>Nature of work</td>
<td>0.29**</td>
</tr>
<tr>
<td>Communication</td>
<td>0.28**</td>
</tr>
</tbody>
</table>

**$p<0.01$; *$p<0.5$**

The results of the third aim show that no significant correlation was found between the total organizational commitment and self-esteem as well as between all the OCS variables and self-esteem. The regression of organizational commitment on predictor variables (job satisfaction, self-esteem and biographical variables) are presented in Table 4. The results of the regression analysis in Table 4 indicate that the JSS communication variable emerged as a significant predictor of the affective organizational commitment ($F=5.884$, $p<0.05$) as well as for the normative commitment ($F=8.350$, $p<0.01$), explaining 6% and 8% of the variance respectively. Teaching level emerged as the only biographical variable that is a significant predictor of continuance commitment ($F=7.079$, $p<0.01$), contributing 7% of the variance.
Table 4: Regression of Organizational Commitment on Job Satisfaction, Self-Esteem and biographical variables

<table>
<thead>
<tr>
<th>Predictors of Organisational Commitment</th>
<th>$R^2$</th>
<th>F</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>Affective Commitment</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Communication</td>
<td>0.06</td>
<td>5.884</td>
<td>0.00*</td>
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<tr>
<td>Normative Commitment</td>
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<td></td>
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</tr>
<tr>
<td>Communication</td>
<td>0.08</td>
<td>8.350</td>
<td>0.00**</td>
</tr>
<tr>
<td>Continuance Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching Level</td>
<td>0.07</td>
<td>7.079</td>
<td>0.00**</td>
</tr>
</tbody>
</table>

**p<0.01    *p<0.05

7. Discussion

The findings reveal that the five JSS variables, namely pay, supervision, co-workers, nature of work, communication and OCS normative commitment variable are positively and significantly related. These findings are consistent with those of previous studies [20]. This suggest that teachers who are satisfied with these job satisfaction drivers seem to feel more obliged to remain with the organization because of social norms. Research suggests that normative commitment is characterized by the obligations that create a psychological contract between employer and employee [25], [23], [14], [20]. The findings further reveal that the JSS communication variable and OCS affective commitment variable are negatively and significantly related. This implies that teachers who are not satisfied with communication in the organization tend to remain with the organization not because they emotionally feel belonging to it.

The absence of a significant relationship observed between job satisfaction and continuance commitment suggest that teachers’ decision to stay with the organization due to obligation (normative commitment) may be a consequence of their satisfaction with extrinsic motivational factors (pay, supervision, co-workers, nature of work, communication) rather than the costs associated with leaving the organization (continuance commitment) [25], [20].

The findings of this study also indicate that a significant positive correlation was found between the total job satisfaction and self-esteem. Significant positive relationship was also observed between the three JSS variables, namely co-workers, nature of work, communication, and self-esteem. This suggests that teachers who are satisfied with these job satisfaction drivers seem to have a high positive self-esteem. The findings of the present study, which show a significant correlation between total job satisfaction and self-esteem are consistent with those of other researchers [5], [16].

The findings further indicate that no significant correlation was found between the total organizational commitment and self-esteem. No significant relationship was also observed between all the OCS variables and self-esteem. The findings of this study, which show no significant correlation between total organizational commitment and self-esteem are consistent with those of other studies [17], [19], [12] but contrast those of other researchers [5].

Lastly, the findings show that the JSS communication variable is the best predictor of the affective organizational commitment as well as for the normative commitment. This indicates that teachers would have more desire and consider morally appropriate to remain with an organization if it has effective communication. Teaching level is the biographical variable that appears as a best predictor of continuance commitment. This suggests that the likelihood of teachers to stay with the employer, due to perceived costs associated with leaving, depends on the level at which they teach.

8. Conclusion

Deducing from the findings of this study, the following conclusions are drawn: there is no significant relationship between total job satisfaction and total organizational commitment but there is a significant positive relationship between the five JSS variables, namely pay, supervision, co-workers, nature of work, communication and OCS normative commitment variable; the JSS communication variable and OCS affective commitment variable are negatively and significantly related; total job satisfaction and self-esteem are positively and significantly related; the three JSS variables, namely co-workers, nature of work, communication and
self-esteem are positively and significantly related; there is no significant relationship between the organizational commitment and self-esteem; the JSS communication variable is the best predictor of the affective organizational commitment as well as for the normative commitment; teaching level is the best predictor of continuance commitment. Given that this study was limited to teachers in one district of a province in South Africa, further research, which will include other districts in the same and other provinces is proposed so that more light can be shed on the findings.

9. References


Working in a Hothouse? Educational Leadership in Times of Natural Disaster

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Abstract

This research was undertaken in 2012, two years after the beginning of the major Christchurch earthquakes in New Zealand. The purpose of the research was to study sustainable leadership and resilience in NZ primary school Principal’s during a natural disaster. This was done via a literature review and interviewing twelve school Principals who reflected on their experiences and what enabled them to continue leading in schools in Christchurch, New Zealand following a series of major earthquakes. Through comparing interview results with theory, a visual model of sustainable, resilient leadership was developed based on the findings of the research and a Maori model of Health.

1. Introduction

The literature review summary which forms the theoretical basis of this paper was conducted using a thematic approach where books and articles were categorized according to various major themes. These themes had been identified in the early stages of initial reading as pertinent to the study. Research was also categorized as national or international, as the primary focus for this paper is New Zealand schools. However, the literature extends beyond New Zealand as there was simply not enough material to give depth to the findings, and the international literature provides a broader perspective on resilience and sustainability.

Primary sources included books, journals and newspaper articles as well as various addresses, principals’ conferences and regional principal meetings. Secondary information was obtained via database searches and from various websites on educational leadership, for example, Leadspace, New Zealand Educational Association Leadership and National College for School Leadership in the United Kingdom.

Coupled with this literature review summary, an action research inquiry occurred using a mixed method approach of data collection. Principal resilience and sustainability was examined through face to face interviews (n =12) with Principals in primary schools of various sizes (U2-5 which equates to 100-600 pupils). Initially, interviews were to be conducted throughout New Zealand, however, as this research inquiry progressed, after interviewing the first two Principals in Christchurch (where the author is based), it became evident that for Canterbury Principals their view of sustainability and resilience was coloured by the recent traumatic experiences (major earthquakes) they had been through. The author believed this provided a unique opportunity for data collection, and an examination of Principals and how they cope under extreme pressure and as a result, decided to select Canterbury principals only, in the spirit of inquiry learning.

Information around resilience was gathered from a positive psychology (job satisfaction and enjoyment) and a negative psychology (struggles). Sustainability was examined through a discussion of coping mechanisms under pressure and factors which assist with Principal well-being and the ability to remain in the job despite the pressures one faces. Principals were then asked whether they see themselves in the profession long term (in five plus years’ time) and they were asked for any other comments.

It became clear that this research presented a prime opportunity (rarely given) to investigate how these Principals have remained in the profession through this traumatic time, and the factors that have enabled them to be resilient and sustainable, through the last two years.

2. Research Methodology

2.1. Definitions

In order to examine what resilience and sustainability are, it is important to begin by defining them. Zolli and Healy [14] define resilience as “the capacity of a system, enterprise, or a person to maintain its core purpose and integrity in the face of dramatically changed circumstances,” and argue that the resilient mindset allows some to adapt to technological, cultural, and environment change much better and faster than others.

They see resilience as “preserving adaptive capacity (p. 8)—the ability to adapt to changed circumstances while fulfilling one’s core purpose, which is an essential skill in an age of unforeseeable disruption and volatility” (p.9). They believed it is just as applicable to individuals as it is to institutions.

They believe that many systems and cultures have learned to thrive “by encouraging adaptation,
agility, cooperation, connectivity, and diversity.” This also makes it clear that what resiliency does not represent is surrender.

2.2. Resiliency of School Leaders

How then is resiliency developed in individuals and in organisations such as schools? Resiliency in schools and school leaders has become an area which has gained increasing attention among educational researchers in recent years. Werner & Smith [13], in their thirty year study of the qualities of resilient individuals, identified a number of factors which impact on an individual’s ability to be resilient. These include an ability for individuals to give of self in service to others and/or to a cause, to use life skills, to be sociable with a sense of humour and believe in one’s own ability to influence the environment. Resilient individuals are also autonomous and independent, have a positive view of their personal future, are flexible, have spirituality, and can connect to learning and are self-motivated.

This view is reiterated by Milstein & Henry [9] who also noted resilient individuals have feelings of self-worth and confidence, and that resilience is an important factor in motivating people. They describe resiliency as “the capacity to meet challenges and become more capable as a result of these experiences” (p. 11).

2.3. Resilient leaders

Every school or organization will experience challenges from time to time and each leader should have the resilience necessary to take the team through the storm. Jerry L. Patterson and Paul Kelleher writing in their book Resilient School Leaders define resilience as “using one’s energy productively to emerge from adversity stronger than before” [11]. Patterson and Kelleher [11] relate resilience to the ‘realistic optimist’, one who is not surprised easily, as he/she has already come to terms with the reality that disruptions will happen. Effective leaders in schools prepare the staff and students for possible surprises or challenges.

Patterson has identified six strengths of a leader who is a resilient, realistic optimist:

1) Resilient leaders work to understand what is happening because of the adversity, including how they may have contributed to the adversity.

2) They are positive, believing good things can happen, within the constraints posed by the reality, and that they can play a role in making them happen.

3) They are anchored in their core personal and organizational values, staying focused on what’s important rather than allowing adversity to knock them off course.

4) They are persistent in tough times. They recover quickly from setbacks and celebrate small victories along the way.

5) They invest their physical, mental emotional and spiritual energy wisely, knowing when and how to build in recovery time so their energy isn’t drained.

6) They act on the courage of their convictions. They take decisive action when adversity strikes and the stakes are high. Their courage largely comes from being clear about what matters most.

2.4. Sustainability

Sustainability is defined as “holding up, bearing the weight of, or being able to bear the strain of suffering without collapse” [12].

In the context of education, this definition would imply that the ideas or principles of learning created by one school leader will remain under pressure, especially during periods of change; thus “holding up and being able to bear the strain of suffering without collapse”. In times of turmoil or periods of staff turnover, change of students or external governmental changes, and even unforeseen natural disaster, the principles of learning would remain steadfast because they are embedded firmly in the culture and ethos of the school.

Hargreaves & Fink [6] believe that “sustainable leadership is a just and moral form of leadership that benefits us all, now and in the future”. While sustainability is well known as the principle behind environmental management and best business practices, it is time to put it to work in education, they believe. This begins with a strong and unswerving sense of moral purpose, an inner conviction, a hopeful sense of shared purpose, where timeless values are a key. This sense of morality and justice from Hargreaves and Fink [6] tends to overlap with Michael Fullan’s definition in this area of the need to address the external social and moral climate [4].

Key findings from a study of the literature indicate that sustainable leadership puts learning first, addressing it over time, even in the medium term, believing that results will take care of themselves. All other principles of sustainability are secondary to this one. As such, the school principal must be committed to leadership for learning in the first instance and see leadership moving beyond the tenure of any one person, so that an agenda for change will exist long term.

Principals need to have a work-life balance, as well as the ability to reflect on what is learnt in a crisis in order to remain in the profession. The importance of supervision or a listening ear/critical friend outside of the school assists in combating the isolation felt by New Zealand principals, particularly those in rural or small schools. Collaborative
networks and reflective journaling have also been highlighted by recent research as valuable tools for professional growth. Another tool which assists in the formation of sustainable leadership is that of distributed leadership where responsibility is shared in schools and teacher and pupil ownership is evident for long term change to transpire.

A focus on relationships both within the school and its community, the development of a positive school culture, with the principal believing in themselves and having a strong sense of moral purpose are all vital components for sustainable leadership in New Zealand. These coupled with the ability to read the social and political contexts and their affect on schools while at the same time planning for succession and developing capacity in existing staff are the other components essential for sustainable leadership to occur.

3. The New Zealand Situation

At present principalship in New Zealand combines the dual demands of leadership for learning and organisational management, which can prove too much for many, evident from the number leaving the profession.

Within New Zealand over the last five years, one third of principals have left primary and secondary principalship and the average age of those currently serving in the profession is fifty five, while the average retirement age at fifty-seven, indicates that a further one third will have retired by 2010 [2]

This creates an urgent need for sustainable leadership in New Zealand schools, as many of the more experienced principals are departing from the profession to retirement. Those serving under the current principal, in school leadership teams, need to step up and move into the vacant principals’ positions, of the future. [2].

Within New Zealand, with the advent of Tomorrow’s Schools in 1989, “…school leaders had to learn how to develop and manage budgets, they had to become employers, property managers and chief executives to governing bodies. Along with these responsibilities came an increasing range of accountabilities – to the Ministry of Education, the newly established Education Review Team and the local community, - a diversity of compliance requirements”. [10].

These increased demands changed the role of principal from school leader to leader of learning and manager of the day to day running of the school, with increased accountability on a local level given to the newly established Boards of Trustees.

Many principals found this increase in accountability, along with ruthless funding cuts in the early 1990s, a huge change. After this (1994 onward), there was a major review of all curriculum areas, with the emergence of a far more prescribed curriculum, again requiring greater accountability from schools and auditing against this from the Education Review Office.

In a survey of New Zealand principals, where 61% responded, Hogden & Wylie [7] noted "the current stress levels of principals were high or very high (45%)”. Primary principals were over represented in the statistics and stress levels were higher for women or Maori or non NZ European (p. v).

The main stressors for principals stemmed from balancing the teaching and managing aspects of their role, paperwork and workload. Most principals thought they spent more time on management rather than leadership. These role-related pressures were felt more keenly by principals in small or rural schools.

The lack of time to focus on teaching and learning and Ministry of Education initiatives, paperwork and other system demands were identified as having a high impact for over half of the principals.

The next set of stressors included resourcing needs and ERO reviews which had high impact for around 40 per cent of the principals. Principals of small schools, and rural schools, and also those whose rolls were fluctuating or declining, and to a lesser extent those of low socioeconomic decile schools, were more likely to find aspects of their role stressful (p. vi).

It is evident from this research that New Zealand principals need support in managing their stress and remaining in the job. Current stress factors for New Zealand principals include: management versus leadership of learning, lack of time to focus on learning, Ministry of Education compliance and lack of resourcing as well as accountability to the Education Review Office coupled with fluctuating rolls [8].


In term 1 of 2012, a survey was conducted by the Canterbury Primary Principals Association around wellbeing in Canterbury schools. The highest number of respondents ever, (n =140), replied. This survey found that 70% of Principals said they were more tired and stressed than usual. 86% of staff reported they were more stressed and fatigued than usual. 80% of schools experienced property damage from the earthquakes, with 8% significant and 17% moderate damage, causing issues.

Incidents of student stand down and suspensions had more than doubled in Term 1 of 2012, in Canterbury schools, (compared to 2011), and there was a far greater uptake of external support services for schools in Term 1, than in previous years at this time (eg Learning and Behaviour, Special Education...
support, social service agencies). All of these factors placed great pressure on Canterbury Principals in being able to fulfil their duties.

5. What the Principals in the research interviews had to say – Resilience and Sustainability in practice

Twelve primary school principals in the urban area of Christchurch were interviewed during the course of this research. They were asked five questions and whilst the focus was not on the earthquakes and their impact, per se, it soon became evident that for many of those interviewed, the earthquakes and their impact on these individuals and their schools, were still very much foremost in their minds. The summary of interview findings is as follows, which have been reported using a thematic approach:

Number of schools: N=12
Gender of respondent Principals:
42% male
58% female
Length of Principalship of respondents:
0 – 5 years: 8%
6 – 10 years: 42%
11 – 15 years: 25%
16 – 20 years: 17%
21 – 25 years: 8%
School Size:
U2 (up to 51) = 2
U3 (up to 150) = 3
U4 (151–300) = 4
U5 (301–500) = 3
School Type: A mixture of state primary and integrated primary schools in the Christchurch area.

- **Could you describe some of the joys/things that keep you in the job?**
  - Children (seeing them grow/caring for them) 92%
  - Being able to make a difference to children and their families 61%
  - Collegiality among Principals 50%
  - Enjoy working with the community 42%

- **What are some of the struggles you have experienced during your time as a Principal?**
  - Significant lack of external support from key educational agencies we are accountable to 62%
  - Isolation of job (fine line between friendship and being a Principal with staff, hard position) 50%
  - Uncertainty around the future of the school 42%
  - Lack of support for the school 42%

Issues with staff:
- Competency/standard of practice 62%
- Resistance to change 33
- Inability to reflect 25
- Lack of systems in the school 25
- Hide behind NZEI/legal help rather than solving the issue 25
- Strong allegiance to previous leadership 25
- Dysfunctional management team initially 25
- Lack of loyalty 16
- Budget deficit initially 16%

Earthquake pressures:
- No additional support/time off given for Principals unlike teachers/expectations of Principals are far greater in times of trauma in terms of availability and workload 66
- Extremely stressful time 42
- Huge land/property issues 42
- Not trained for this 42
- Impact of quakes on families - relationships/finances/staff 33
- Roll change/turnover, Principals have been blamed for this 33
- Instability in chaplaincy of school (unsettling) 16%

- **What keeps you going in the hard times?**
  - Supportive family (keeps you grounded/partner who listens endlessly) 62%
  - EQs require a different kind of leadership, community stability and relationships have become very important 62
  - Seeking the support of Principal colleagues/Principals Association leadership has been outstanding since the quakes 62
  - My faith/prayer 62
  - Self belief, inner strength, knowing I am working for the educational benefit of children) 50%
  - Walk/keeping fit 50
  - Personal interests/hobbies 50%
  - Distancing myself from the school on weekends 42
  - Remembering it is only a job-being able to leave it behind mentally /big world out there 42
  - Time with friends who are not part of the school community 42
  - School is the one thing that is stable for many of the families in Christchurch, they need us more than ever now as they have lost many local facilities 25%
  - Spending time with my own children 25%
  - Mentoring from another Principal 25%
✓ Support and confidence of the staff team behind you, 25
✓ Supportive Board of Trustees 25
✓ Walking round the playground/spending time with children in the school 25%
✓ Alcohol (stress release) 25
✓ Taking time to consider decisions rather than rushing 25%

- Do you see yourself in the job long term?
  ✓ Yes 33
  ✓ No 42
  ✓ Unsure 25%

“I am in for the long haul, I still think my job is the best in the world. I am past feeling I need to move schools but want to continue to provide the most amazing opportunities in this current school”. (Principal, 18 years)

“I have to focus on the positive, I have learnt from the heartache and Principalship taking over my life. You need to be able to step back and live a balanced life”. (Principal, 9 years)

“I feel disappointed after all the effort I have put into my school, that in a year or two, there may not be a school anymore. This decision is out of my hands, we are in a holding pattern until the Ministry of Education decides what it is going to do with us. The roll has dropped by a third, the buildings are damaged, I am too tired to start again and our community needs a message of hope.” (Principal, 10 years)

“Being a Principal through these earthquakes has been incredibly intense and at times has been like working in a hothouse.” (Principal, 8 years)

5.1. Summary of findings

The joys for principals in Christchurch which keep them going, come first and foremost from the children they work with. Seeing staff grow and develop in leadership capacity and pedagogy, provided satisfaction for many Principals, as well as being able to make a difference in peoples’ lives. Many enjoyed a strong sense of collegiality with other principals and they liked the flexibility, variety and challenge of the job and working with their local communities.

Challenges in the position, have come in the form of a lack of support from key educational agencies that schools are accountable too, isolation in the job, an expectation that the Principal will be “on call” and always there, (despite the fact that they have their own needs and families) and no additional time off was given to Principals after the earthquakes. Many have experienced uncertainty around the future of their job and schools, a high level of stress, a lack of support from their communities and a feeling that they are not trained for principalship in times of trauma on top of dealing with land and property issues.

The responses of the interviewees do demonstrate in part, the significant pressure that has been placed on Canterbury Primary Principals over the last two years, and provide a snapshot into their world and what has sustained them through this terrible time, and the supports they have drawn upon to survive. It highlights some of the supports that Principals have needed in order to continue in their job: their family, changing their leadership style due to the needs of the community, drawing on the support of other colleagues, their faith and self-belief. They have had to use personal interests and hobbies to retain some work life balance and remember that it is only a job.

Keeping fit and spending time outside the school with friends who are not part of the school community has also helped them remain resilient.

Principalship in times of trauma causes the individual to draw deeply on these supports and as one of the respondents said, “the earthquakes have exacerbated what was under the surface in peoples’ lives”.

Many of those interviewed do not see a sustainable future for themselves in principalship as a profession, with almost half of the principals, saying they would not be in the job long term. This is a concern, as when they leave, they take a wealth of experience with them.

5.2. Limitations of the research

The limitations of this type of research come from the small sample size (n=12) and possible methods of selection. Colleagues known to the interviewer through the Canterbury Primary Principals Association [1] were selected, and as such, the group was not randomly selected. The limited time frame, for studying current research in this area, also impacts on the quality of the theoretical findings.

6. Conclusion

A diagrammatic representation of key findings from this research for principal resilience and sustainability has been created by adapting the Maori model of health and well being (Hauora) developed by Mason Durie [3] and coupling it with the participants’ responses (see Figure 1). This identifies the prevalent conditions needed for those interviewed to demonstrate resilience and sustainability:

The most commonly identified qualities used by the interviewed Principals which enabled them to be resilient and remain strong during the recent earthquakes and over the course of their careers are very similar to those identified by Hargreaves and Fink [5] when describing qualities of sustainable educational leaders, who are “able to bear the strain
of suffering without collapse, even in times of natural disaster” (p. 20).

They identify a strong sense of moral purpose which was evident from these Principals comments about their self belief (that they were doing the right thing and working for the common good of the school and its community), alignment with their own inner convictions (their faith) and a hopeful sense of shared purpose (working with the team and other colleagues on the same goals).

Hargreaves and Fink highlighted the importance of learning coming first and again this was evidenced in the respondents answers where they talked about their enjoyment of working children (seeing them grow and making a difference in their lives), and improving teaching and learning.

Work life balance was seen as important by the Principals and is essential for sustainability along with a listening ear, whether it be from their spouse, a critical friend or supervision. Another key factor in the findings was the importance of collaborative networks. All of these factors align with Hargreaves and Fink’s model of sustainable leadership [5].

Whether the respondents are able to bounce back over time (resilient) is something that cannot be determined from this research. Several of these Principals (42%) did not feel they had a long term future in the profession (five plus years), which is disconcerting.

However, the fact that all of these Principals have remained in the profession over the last two years since the earthquakes, despite all of the challenges they have faced during severely testing times, personally and professionally, means they should be congratulated.

7. References


8. Acknowledgements

I would like to thank my husband Ian who always believes in me and also my children - I could not do my job without you.

To the twelve Principals who shared their stories, I am extremely grateful. I found it a privilege to hear the stories of these leaders during this research, some of what they have been through during their careers and thank them for their honesty and openness. I would like to salute them as heroes in their own communities for the way they have continued to lead in the last two years in Christchurch, despite being under extreme pressure, both personally and professionally. Many thanks to the Ministry of Education for funding this research.
Posters
Poster Session 1

An Analysis of Facebook Addiction of Open Education Students: A Case Study from Anadolu University
(Authors: Gül Er, Sinan Aydın, Fikret Er and Harun Sönmez)

The Student Perspective: An Exploratory Study to Understand the Skills Gap in a Midwestern Community
(Authors: Lisa Kittleson, Kelly La Venture)

Developing an Online Mental Health Portal for University Students: The Uni Virtual Clinic (UVC)
(Authors: Amelia Gulliver, Louise Farrer, Kylie Bennett, Anthony Bennett, Kathleen Griffiths)

Online Searching and Validity of Students’ Academic Research: The Case of Kuwait University
(Authors: Sundus Y. Sulaiman)
An Analysis of Facebook Addiction of Open Education Students: A Case Study from Anadolu University

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Abstract

Facebook has become a widespread social network site around the world. According to statistics there are over 1.6 billion monthly active Facebook users, and also more than 1 billion people log on to Facebook daily. In Europe, it is estimated that over 300 million people are actively using Facebook. Facebook’s user-friendliness attracts educators, especially for online learning, to use it for educational purposes. Use of Facebook may break the walls of a classroom to a wider audience which is dynamic. Facebook allows educators to gather information about the users in a specific group via APIs, so that the educator can create state of the art analytics about their students and their interactions about specific subject given in the course material via Facebook. Some research show that social network sites enable students to interact with one another, build a sense of community, develop content, as well as require students to be active in their own learning through participating, thinking, and contributing. Anadolu University Open and Distance Education System is the first institution in Turkey that offers higher education through contemporary distance education model. Articles 5 and 12 of the Law no. 2547, regulating the Turkish Higher Education and adopted on November 6, 1981, allowed Turkish universities to offer continuous and open education. In 1982, the Faculty of Open Education of Anadolu University was officially appointed by the Higher Education Council as the institution responsible for offering continuous and open education. The Open Education Model, which started with two distance education programs in the field of Economics and Business Administration, has expanded since then, now offering many undergraduate and associate degree programs as well as certificate programs for students. Today around 1.4 million students are enrolled to the programs offered by Anadolu University Open Education system in Turkey. In this study, using Bergen Facebook Addiction survey, an analysis of the Facebook addiction of the students who are already enrolled in one of the open education programs offered by Anadolu University is investigated. Statistical analysis of the data is done by using categorical data analysis techniques. The results obtained from the analysis are used to discuss the usefulness of Facebook on open education.

Acknowledgments

This study is funded by Contract No 1601E011 from the Anadolu University Scientific Research Projects (BAP).

References


The Student Perspective: An Exploratory Study to Understand the Skills Gap in a Midwestern Community

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Abstract

In November 2015, a local foundation partnered with Bemidji State University’s Marketing Assistance and Research Solutions (MARS) to capture data from 108 organizations in a Midwestern municipality to further understand the skills gap within the community.

1. Introduction

The skills gap is real. Organizations in a Midwestern community need job seekers who have the essential skills and abilities to fill open and needed positions. Then, upon hire, can use these essential skills and abilities to immediately make a productive contribution. The purpose of the research was “to understand the skills gap in a Midwestern community.”

2. Research Design & Data Collection Method

There was one research design employed in this study. In lieu of other forms of data collection, exploratory research design and the use of a semi-structured interview method using a judgement sample was used to gather data from 77 primary decision makers (i.e. CEO, CFO, President, Founder, Owner, etc.) of local organizations in 13 sectors. Additionally, 3 interviews were conducted with primary leaders to provide a “Community Perspective.”

3. Findings

76.92% have job openings for which they are unable to find qualified candidates. 69.23% reject applicants due to not having the proper skill set required, 46.15% have open positions for which they sometimes get no applicants, 61.54% rate the severity of the current shortage at severe, 40% are not doing anything to respond to the shortage, 61.54% are creating benefit packages to recruit and retain qualified workers, 38.46% feel that technical skills and 38.46% soft skills are valuable to improving the workforce.

4. Mars Student Researcher Perspective

This skills gap is real and has an affect on organizations across the world. As a college graduate pursuing a career, this topic is not something that initially comes to mind, but is very important and essential to the growth and change in all organizations across the globe as millennials and future generations continue to change the workforce. This will only continue to expand and organizations need to take action in order to adjust and retain employees.
Developing an Online Mental Health Portal for University Students: The Uni Virtual Clinic (UVC)

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Abstract

Mental disorders are highly prevalent in university students. Despite the severity of untreated disorders, less than one-fifth of students with mental health problems utilise mental health services. Traditional university-based mental health clinics tend to deliver face-to-face care, which may be more time consuming and less cost-effective than distal interventions. In addition, technology-based interventions are highly relevant to this population. Consequently, there is a need for the development of a university based online service to complement traditional services and more efficiently address student mental health. The uni virtual clinic (UVC) is a comprehensive online service that has been designed to prevent and treat mental health problems and related issues in university students. It is anonymous, free to the end-user, tailored, and incorporates evidence-based treatments and information. The UVC contains resources targeting unique issues experienced by university students that impact on their mental health. It provides students with information about mental health problems and other related student-specific challenges, screening and self-help tools, and information about where they can receive help for mental health problems and other related problems at university. The information provided by the UVC about sources of help can be easily tailored for each university’s set of resources. A key priority of the UVC is to enable young people to find the right help as quickly and easily as possible. Accordingly the clinic incorporates devices that enable university users with varying levels of knowledge about mental health problems to navigate through the system. This includes the problem-solving tool, which helps users to find the most appropriate resources through both guided and unguided pathways through the clinic. In addition, the clinic can be tailored to the user’s preferences, the interface enabling students to save factsheets, tools, and self-help packages on their UVC profile homepage to complete at a later date. The pilot version of the UVC has been completed. The potential for the dissemination of the UVC in universities globally is strong. In addition, the UVC has potential to serve as a model for developing such clinics for young people in schools and other settings.
Online Searching and Validity of Students' Academic Research: The Case of Kuwait University

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Abstract

This study has been conducted in order to explore the means the students use for information and data collection required for research papers in two colleges: College of Business Administration and College of Social Sciences at Kuwait University.

A Sample of 500 students were surveyed on the uses of search techniques and methods containing the default browser on their smart phone versus the use of the library facilities and database to emphasise proper searching methods, techniques, and choice of sources including domains; in terms of validity, authenticity, and credibility.

Students must also be encouraged to visit the library more often for a more accurate, reliable, and wider selection of sources that include proper databases provided by the library and are relevant to their search fields.

It has been proven to a great extent that students of all ages rely on online searching due to the easy access to such information thanks to the smart phones and their default browser I. E. Google; Allowing it to be the only means to obtain information without filtering the credibility nor authenticity of the source, thus hindering the integrity of the writer and his words.

It is concluded that an effort must be made to bridge the gap between students and other better means of retrieving scholastic information rather than resorting to online weak, unsupported, unverified information for his/her paper.

Thus, with the effort to reconstruct, and restructure the ELU curriculum to amend those mistakes and reintroduce the library and its facilities as a vast source of great knowledge; in other words to convince the students that the library is a portal to proper and authentic information rather than rendering it obsolete.
Poster Session 2

Evaluation of a Teaching Sequence Regarding Science, Technology and Society Values in Higher Education
(Authors: María Amparo Oliveros, Benjamín Valde, Eduardo Cabrera and Lidia Vargas)

Financial Literacy of Open Education Students in Anadolu University, Turkey
(Authors: Fikret Er, Ali Özdemir, M. Recep Okur, S. Fatih Kostakoğlu, Fatih Temizel and Harun Sönmez)

Community of Practice in a Government-led International Exchange Programme: Intercultural identity and the role of the nation-state
(Author: Haruko Ishii)

Sustainable industrial ecosystem model based on CTS + I for economic growth in development countries
(Authors: R. Ibarra, B. Valdez, A. Oliveros, E. Cabrera and I. Araujo)
Evaluation of a Teaching Sequence Regarding Science, Technology and Society Values in Higher Education

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Abstract

This work shows the results of a teaching-learning sequence applied to the concept of the nature of science and technology implemented on manufacturing technology engineering students at Autonomous University of Baja California, Mexico, during the academic period 2012-2013. The sequence was implemented to the course of Applied Human Values, on which students ponder and debate on principles of science and technology; taking as main objective to identify student beliefs on ethics, and values and assumptions of science. The Methodological design is quasi-experimental, pre-post-test without controlling group. The study allows identifying a slight improvement in the engineering student beliefs about the aspects of science, technology and society that are being evaluated.

Keywords Engineering Students, Instructional Sequence, STS Aspects, Values.
Financial Literacy of Open Education Students in Anadolu University, Turkey

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Anadolu University, Turkey

Abstract

After the 2008 global economic crisis, country governments cast financial literacy an important role because of the socio economic results that the individuals with enormous debts and generally with inadequate retirement plans face. Because of this reason, it is considered to be valuable to measure the financial literacy level of every socio economic status in order to be able to form prevention sets. Anadolu University Open and Distance Education System is the first institution in Turkey that offers higher education through contemporary distance education model. In 1982, the Faculty of Open Education of Anadolu University was officially appointed by the Higher Education Council as the institution responsible for offering continuous and open education. Today around 1.4 million students are enrolled to the programs offered by Anadolu University Open Education system in Turkey. Anadolu University also offers a second university opportunity to the people with a university degree. Therefore the student body of Anadolu University Open Education system is very diversified and dynamic. There are students from almost every age group starting from eighteen and going towards late sixties. In this study the financial literacy survey created by OECD is adapted and a survey in Turkish is given to a sample of students from Open Education System of Anadolu University. There are 1285 students in the sample. In order to analyze the data set, first an exploratory data analysis of the data is applied then categorical data analysis of the some variables are investigated. Finally, a factor analysis of the data set is also carried out. In this study, the results of analysis is given and discussed in detail and also implications of the results in terms of open education system are shown.

Acknowledgements

This study is funded by contract No 1507E551 from Anadolu University Scientific Research Projects.

References


Community of Practice in a Government-led International Exchange Programme: Intercultural identity and the role of the nation-state

Haruko Ishii

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Abstract

This poster presentation poses two questions; one is about the role of the “nation state” on the government-led international exchange programme where the participant’s intercultural learning is particularly seen on an individual basis. Second is how the participant’s learning and construction of an intercultural identity can be described by the idea of “community of practice.”

The international exchange programme is called the Ship for World Youth (SWY) programme and has been operated by the Cabinet Office of Japan for the past 28 years. It is a programme that involves 200 youths (18-30 years of age) from 12 countries around the world each year. Although SWY is not an academic program and does not have a curriculum, the programme’s environment promotes good learning opportunities through discussion, particularly on global issues. The slogan of SWY is “How to make the world a better place.”

While living together during 40 days onboard, participants faced and had to resolve, certain conflicts in addition to sharing limited space and resources, as humans have to do on Earth. It was observed that participants’ interests shifted from global issues of discussion to how we can mutually understand and respect each other as individuals.

The present study, which forms part of my doctoral thesis, is based on interview research conducted with the Japanese government officials responsible for organising the SWY programme.
Sustainable industrial ecosystem model based on CTS + I for economic growth in development countries

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Abstract

The proposed model of sustainable industrial ecosystem incorporates four organizational systems: 1) Strategic linkage of triple helix, 2) Competitiveness and innovation, 3) Business intelligence, and 4) Social responsibility. Researchers and students from universities and research centers nationwide participating in the challenges and strategic projects of companies in the industry. The implementation greatly benefit indicators of productivity and competitiveness in the industry with permanent impacts that permeate society. It seeks to promote an innovation ecosystem, which begins with the development of talent and skills, integration of university researchers in the scientific-technological development programs including industry projects. The creation of shared infrastructure between school and enterprise, integration of systems and technology management processes and intellectual property to generate a change that brings economic growth to the region and the country. The sustainable ecosystem model greatly impacts indicators that are part of the National Development Plan and the levels of competitiveness of emerging countries. An impact on society, as culture of innovation change, with companies reaching high added value, more high-paying jobs and a higher quality of life for families.
Poster Session 3

Examining Collective Responsibility for Knowledge Advancement through Portfolio Assessment
(Author: Yuyao Tong)

Building knowledge community in post-secondary large lecture courses: A Blended Fostering Communities of Learners Approach
(Author: Steven Ehrlick)

The Review on Teaching Program for Language Lesson
(Author: Aysegul Karabay)
Exchanging Collective Responsibility for Knowledge Advancement through Portfolio Assessment

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Abstract

This abstract examined students’ collective responsibility for knowledge advancement in a principle-based knowledge building environment, supported by Knowledge Forum® (KF), through portfolio assessment. In the knowledge building approach, collective cognitive responsibility and adding value to the community’s knowledge are emphasized, and twelve KB principles were constructed to support the development of KB communities [1]. As well, knowledge is viewed as a social product and ideas could be sustainable improved [2]. To support knowledge building pedagogies, Knowledge Forum®, which is a multimedia community knowledge space, was designed to provide a shared discourse environment. Scaffolds, embedded in KF, are regarded as a meta-cognitive prompts to help students to generate their notes, such as “What I initially thought”.

Furthermore, in the knowledge building environment, the role of assessment designs in scaffolding students’ collective knowledge advancement was also emphasized. Student-directed electronic portfolio assessment, asking students to identify their notes in the KF, is designed to help students characterize their collaborative inquiry in KF [3].

In this study, participants were forty Grade 9 students who studied a Chinese novel Romance of the Three Kingdoms in a literature course in a Hong Kong secondary school. Students generated questions, explanations and constructed portfolio notes on KF. Qualitative analyses of students’ portfolio notes suggested that it can scaffold students to characterize the collective knowledge advancement, moreover, correlation analysis showed that KB principles were related to domain understanding. Implications are discussed.

References


Building knowledge community in post-secondary large lecture courses: A Blended Fostering Communities of Learners Approach

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Abstract

This design-based research study examines the ways in which the knowledge community collaborative learning approach can be enacted in undergraduate large lecture courses through a scaffolded, complex curricular design that utilizes active, inquiry-based learning. This study involves the re-design of a course that covers basic business concepts for undergraduate media students. By combining a lecture in a traditional setting with smaller breakout tutorials, the study involves adopting and adapting the Fostering Communities of Learners (FCL) pedagogical model (Brown & Campione, 1996) by blending its methodology with digital components of both Knowledge Building (KB; Scardamalia & Bereiter, 2006) and Knowledge Community and Inquiry (KCI; Slotta & Najafi, 2010), most prominently with the addition of a digital collaborative knowledge base. One of the primary goals of this research is to identify digital tools that will facilitate and enhance deep inquiry within a knowledge community and thereby expand upon the FCL pedagogical model. By appropriating design elements from KCI and KB, a Collaborative Knowledge Base (CKB) was introduced as a major research element in the curricular design. The CKB is intended to be a permanent online hub of ideas that would be impossible for one student to amass if working independently. It will become a research library that all students and student groups can contribute to and benefit from, as well as serving as a resource for completion of the consequential task.

References


The Review on Teaching Program for Language Lesson

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Abstract

The curriculum which is determiner training -education activities at schools is a guide which shows what will be taught, why it will be taught and how it will be taught related to a lesson during training-education period and in another saying, it is a project plan which has got this quality. Interviews which are made during the application of a program may reveal whether outputs of the program are deficient. The goal of this research is to review on the curriculum of Turkish lesson which is a language lesson in Turkey, in accordance with views of formal teachers. This research is a case study. On the case study, researcher tried to make an integrative model from complex events and facts in the environment and viewpoints of persons who attend in the research during this period and the reason of their behaviours are reviewed deeply. 20 formal teachers who work at state schools which are chosen in a purpose compose the working group. Questions have been involved to determine on views of teachers related to the assessment of curriculum for Turkish lesson on a semi-structured interview form. Qualitative data has been reviewed with the use of content analysis. As a result of the content analysis which has been made, it has been determined that formal teachers have found the objectives efficient on the learning domains of listening, reading, writing and they waiting to have a various supports for it as they have needed e-sources as to use them during the lesson.
Many thanks for your participation and we hope to see you next year…!

Cambridge University, UK
www.liceducation.org

Have a great trip back home….!!!