We would like to dedicate this issue of the
IAFOR Journal of Education to the late
Professor Stuart D. B. Picken

The Reverend Professor Stuart D. B. Picken (1942-2016)

Order of the Sacred Treasure (瑞宝中綬章), M.A. (Hons), B.D., Ph.D. (Glasgow), F.R.A.S.

Cleric and Philosopher

It is with sadness that we inform our friends of IAFOR that the Chairman of the organisation, the Reverend Professor Stuart D. B. Picken, passed away on Friday, 5 August, 2016.

Stuart Picken was born in Glasgow in 1942 and enjoyed an international reputation in philosophy, comparative religious and cultural studies, but it is as a scholar of Japan and Japanese thought for which he will be best remembered, and as one of the world's foremost experts on Shinto.

Picken entered University of Glasgow, Scotland aged 16, to study divinity and philosophy, and his studies culminated with a doctorate that looked at Christianity and the work of Kant. In 1966 he was ordained in the Church of Scotland, and began his career as a minister in Orkney.

However, his curiosity led him from isolated rural Scotland to the world's largest city, and following a visit to Tokyo on a Rotary scholarship, Picken was appointed Professor of Philosophy at the International Christian University (ICU) in 1972. Here he turned his western theological and philosophical training to comparative religious and cultural studies of Japan, at a time when the country was emerging from the shadows of the Second World War.

His groundbreaking and controversial work on suicide in Japan made his name within the country, but it was his subsequent work on Shinto that influenced the rehabilitation of the religion at a time when it was dismissed in the west as pagan and primitive, or unjustly caricatured for its wartime associations.

As Japan emerged as an economic superpower in the 1970s and 1980s, and given his growing prominence as an academic, he was much in demand as part of a period where Japanese wanted to learn more about themselves as seen through the eyes of the west, and where western businesses were eager to learn from the all-conquering Japanese model. By then fluent in Japanese, Picken served as a business consultant to such corporations and also served as a consultant to various businesses, including Jun Ashida Ltd., Mitsui Mining & Smelting Corp., Kobe Steel, and Japan Airlines. During this period he was active in the St Andrew Society, when he founded the Tokyo Highland Games, which is still an annual event.

Professor Stuart D. B. Picken (IAFOR), Professor Arthur Stockwin, OBE (The University of Oxford) and Professor Jun Arima (University of Tokyo) discuss Japanese security at The European Conference on Economics, Politics and Law 2014.

The author of a dozen books and over 130 articles and papers, Picken was to stay at ICU for 25 years, where he was a popular lecturer and mentor to both Japanese and visiting scholars, serving tenures as Chairman of the Division of Humanities from 1981-1983, and as Director of Japanese Studies from 1995-1997, as well as concurrently founding Director of the Centre for Japanese Studies at the University of Stirling, Scotland from 1985-1988. A keen amateur footballer, whose devotion to Japan was rivalled only with that he felt for Glasgow Rangers, he continued to play into his fifties at ICU, encouraging many students to take up the sport.

He left ICU in 1997, and from then until 2004 was appointed the founding Dean of the Faculty of Foreign Languages and Asian Studies at Nagoya University of Commerce and Business, and the founding Dean of the Graduate School Division of Global Business Communication from 2002-2004.

Upon his retirement from his academic posts, he returned to Scotland to re-enter the ministry in 2005, as minister of the linked charge of Ardoch with Blackford, yet he continued his academic and Japanese interests as the Chairman of the Japan Society of Scotland.

Whether in his research or teaching, Picken devoted much of his life to increasing understanding between his adopted country and the west, and in 2007 he was recognised with the Order of the Sacred Treasure, an imperial decoration for his pioneering research and outstanding contribution to the promotion of friendship and mutual understanding between Japan and the UK. He also served as the International Adviser to the High Priest of the Tsubaki Grand Shrine, one of Japan's largest and oldest shrines.

From 2009, he was the founding Chairman of The International Academic Forum (IAFOR), a Japan-based interdisciplinary research and events organisation, where he was highly active in helping nurture and mentor a new generation of academics, and facilitate better intercultural and international awareness and understanding, and in the years immediately preceding his illness, he continued to lecture throughout the world, in Europe, North America, Asia and the Middle East.

He is survived by his wife, Hong Wen, and children, Fiona, Jeannette, William and Lynn.

President & C.E.O.

Dr. Joseph Haldane

B.A., Ph.D. (London), F.R.S.A., F.R.A.S.

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Prof. Dr. Raymond Q. Datuon completed Bachelor in Secondary Education, majoring in history (2002), at the Philippine Normal University, a Masters in Educational Management (2010) in Polytechnic University of the Philippines-Open University Systems and a Doctorate in Educational Management (2013) in Polytechnic University of the Philippines. He served as Executive Officer and volunteer campus minister of Marian Youth Movement in the Archdiocese of Manila. Appointed as Chief Justice in the Student Government of the Philippine Normal University in 2001-2002. Full-time Faculty in St. Mary's Academy of Caloocan City from 2003-2005 and presently the School of Education Dean, concurrently the Officer In-charge of the Student Life Office, Head of Faculty and Staff Development Office and Senior High School Program in Chiang Kai Shek College (Manila, Philippines) and Part-Time Lecturer in Far Eastern University-Institute of Technology (Manila, Philippines). He was also appointed as Head of Research, Publication, and Faculty Development Office in Chiang Kai Shek College from October 2013 – June 2014. Currently, he is looking forward for opportunities in pursuing postdoctoral studies.

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Jillian Marchant holds a Master's Degree in Public Administration with a major in Policy and is presently a Ph.D. Candidate with the School of Education at James Cook University in Australia. She is a published author of several articles that seek to appreciate the unfolding association between increasingly accessible formal adult learning and social development in

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Dr. Daniel Velasco earned his B.A. in both English and French from UCLA, and his M.Ed. from National University. He spent the first part of his career in the field of international/cross-cultural education as an instructor, administrator, student counselor, and academic director at a variety of post-secondary institutions. His role as an international student counseLlor prompted him to diversify his education, and he soon earned an M.A. in psychology from Antioch University, and started a private practice specialising in positive psychology. He continued on to The Chicago School of Professional Psychology, where he earned a PhD in International Psychology. Dr Velasco currently resides in Japan, where he is a mental health counsellor, associate professor, researcher, and public speaker. He regularly lectures on intercultural communication, teaching strategies, positive psychology, and counseLling strategies with a focus on adaptation and acculturation. He is an active member of the Japanese Psychological Association (JPA), the American Psychological Association (APA), the International Council of Psychologists (ICP), the International Mental Health Professionals Japan (IMHPJ), the Japan Association for Language Teaching (JALT), and Teachers of English to Speakers of Other Languages (TESOL).

Dr. Tony Yeigh, Southern Cross University, Australia

Dr. Yeigh is a Lecturer in the School of Education at Southern Cross University (SCU), Australia, where he teaches in the areas of educational psychology and classroom management. Dr. Yeigh has also had extensive consultancies relating to the Australian Government Quality Teacher Programme (AGQTP), working with classroom teachers at both the primary and secondary levels of professional development. His research interests are in the areas of working memory (WM) and classroom instructional design, and in this respect his Ph.D. thesis examined the relationship between cognitive load and cognitive inhibition, an executive function of the WM system. Dr. Yeigh is a research associate with the Centre for Children and Young People (SCU), as well as a member of the Association for Mindfulness in Education (AME) and of the Teacher Education Research Group (SCU). He is also leader of the School of Education Learning Sciences Research Group, which focuses on the cognitive-

psychological, social-psychological and cultural-psychological foundations of human learning. Based on these research affiliations Dr Yeigh has published widely in high quality education research journals and texts, and is currently pursuing research in the areas of pre-service teacher training, educational mindfulness and social-emotional wellbeing.

Dr. Yoshihiko Yamamotoe, Shizuoka University, Japan

Dr. Yoshihiko Yamamoto is currently teaching English at Shizuoka University and has lived in both Australia and New Zealand for more than 10 years. He holds a PhD (Education), University of Canberra, M.A. in TESOL, University of Canberra, B.A. in Education & in Linguistics, Victoria University of Wellington. His research areas are Discourse Analysis (gender talk), Sociolinguistics (gender stereotypes) and Applied Linguistics (in general).

Editors' Introduction

It is our great pleasure and honour to introduce Volume 4, Issue 2 of IAFOR Journal of Education. This issue is a selection of papers submitted directly to our journal as well as studies presented during:

1. The Inaugural Asian Conference on Education & International Development 2015. ACE-ID 2015 was held at the Rihga Royal Hotel, Osaka, Japan, from March 29 to April 1, 2015. Conference Theme: "Education, Power and Empowerment: Education as an Instrument of Global Transformation".
2. The Asian Conference on Education 2015. ACE 2015 was held at the Art Center of Kobe, Kobe, Japan, from Wednesday, October 21 to Sunday, October 25, 2015. Conference Theme: "Education, Power and Empowerment: Transcending Boundaries".
3. The Asian Conference on Education and International Development 2016. ACE-ID 2016 was held at the Art Center of Kobe, Kobe, Japan, from Sunday, April 3 to Wednesday, April 6, 2016. Conference Theme: "Education and Social Justice: Learning For Global Diversity".
4. The European Conference on Education 2016. ECE 2016 was held at the The Jurys Inn Brighton Waterfront, Brighton, United Kingdom, from Wednesday, June 29 to Sunday, July 3, 2016. Conference Theme: "Education and Social Justice: Democratising Education".

The first paper, written by Sylvia Chong Nguik Yin is entitled "Identification of Early Predictors of Adult Learners' Academic Performance in Higher Education". This study used enrollment data from a Singapore university that focuses on adult learners. The paper describes predictive modelling techniques developed for use in this study. The research findings highlight the impact of students' prior academic preparation including the quality of the school they attended, prior test scores, and prior English and Mathematics grades. These were significant predictors of the adult learner's academic performance for the first semester at university.

The second paper, written by Mozhgan Ghaffarzadeh is entitled "A Comparative Study of Discrimination in Education: The Learning Environment and Behaviours of Students and Teachers in Iran". This paper explores the teaching and learning environment as well as the physical charactaristics of ten schools in Iran including public, private, and semi-private schools. Observations were recorded in detailed notes over ten years during teaching and inspection within the schools. Findings describe differences in teaching methods and facilities and point out possible remedies for inequities between schools in Iran.

The third paper, entitled "Assessing the Metacognitive Awareness among the Foundation in Engineering Students" is co-authored by Betsy Lee Guat Poh, Kasturi Muthoosamy, Chiang Choon Lai, and Ooi Chel Gee. This article describes the awareness among a group of first year students of their metacognitive abilities throughout their first semester in the Foundation in Engineering program. Metacognitive Awareness Inventory (MAI) (Schraw & Dennison, 1994) was employed as a rating instrument to measure the students' baseline in metacognition and traced their metacognitive strength in a consecutive manner. The ten weeks of teaching and learning sessions exposed the students to various activities and have somehow revamped the students' rating in term of metacognitive knowledge and experiences. The students' responses showed a gradual improvement in their metacognitive abilities over the preliminary, intermediate and end of the semester surveys, with the exception of debugging skills. As a future study, the researchers suggest an intervention on a specific module to be carried out to enhance the students' debugging skills along with the other seven MAI components.

The fourth paper, entitled "The Link between the Process of Change and Coaching in an Organization – A Case Study" is written by Josephine Jim. This article demonstrated the benefits of coaching in supporting organizational learning and change in a lifelong learning institution in Hong Kong. The author recorded the staffs' responses to the change process on a series of factors and issues in the pre- and post-coaching stages. Findings from the case study support providing coaching to staff going through the change process of a huge project involving changes in various levels in the organization: management, administration, operation and services. The author advocates coaching in education institutions where it is not currently a common practice.

The fifth paper, co-authored by Adolfina Pérez Garcias and Victoria I. Marín, is entitled "Ethics Issues of Digital Contents for Pre-Service Primary Teachers: A Gamification Experience for Self-Asssessment with Socrative". This study presents an educational experiment with pre-service teachers for primary school from the University of the Balearic Islands, who were involved in a learning activity using the webtool Socrative for quizzes to work on the topic of ethics issues of digital contents. Based on the activity, the authors highlight the interest on gamification strategies to encourage learning and participation.

The sixth paper, written by Adam Gyenes, is entitled "Conspicuous Internationalization? Creating an 'International Communication Lounge' on a Japanese University Campus." The article explores the process by which a self-access center for language learning and intercultural exchange was established on a university campus in Japan. A theoretical model of policy borrowing is used to frame the author's ethnographic work, supported by interview data collected from various stakeholders in the university. The center is shown to have become a hub for internationalization within the university: a gathering place where students are motivated by one another to study English and find out about study abroad, and a space used to enhance the international image of the university.

The seventh paper, entitled "An Analysis of Creative Process Learning in Computer Game Activities Through Player Experiences", is by Wilawan Inchamnan. This paper describes a behavior analysis for measuring the creative potential of computer game activities and learning outcomes. The research approach applies heuristic checklists in the field of the gameplay to analyze the factors in the stage of player activities involved in the performance of the task and to examine player experiences with the Player Experience of Need Satisfaction (PENS) survey. The findings show the creative potential that occurred to yield levels of creative performance within game play activities to support learning.

The eighth paper, co-authored by Yang Wang and Chao Liu, is entitled "Cultivate Mindfulness: A Case Study of Mindful Learning in an English as a Foreign Language Classroom." This case study investigated how mindfulness affected the learning process of college English as a foreign language in China and found that by engaging in mindful strategies, students took ownership of their learning; the students formed a closer relationship with each other and with their instructor. In such a community, the students became more willing to take risks, concentrated on their learning, and became more confident about learning English language. The students started to value their own learning process and became more motivated to learn.

The ninth paper, written by Chen Szu-An, is entitled "A Study of Comparatively Low Achievement Students' Bilingualized Dictionary Use and their English Learning." This paper presents a study on Taiwanese EFL learners' behaviors of using bilingualized dictionaries and their perspectives on book dictionary. The research participants were 147 comparatively low-achievement university students. Questionnaire results present their positive reflection on the

helpfulness of using bilingualized dictionaries in learning English. Their dictionary use behaviors might be affected by classroom activities and assignments. This paper concludes by arguing that advance guidance of using dictionaries may need to be integrated into the course.

Please note that we welcome original research papers in the field of education submitted by teachers, scholars, and education professionals, who may submit their manuscripts even though they did not participate in one of the conferences held by IAFOR.

We also welcome book reviews, reviews of the literature in the field, and contributions introducing key educational scholars. The next issue scheduled for March 01, 2017 will also be a selection of papers submitted during the above mentioned conferences. IAFOR publications are freely accessible on the website (Open Access).

Moreover, there is no publication fee for authors. Please find the guidelines on our journal homepage and at the end of this issue, and follow our guide for authors before submitting your paper.

Best regards,

Bernard Montoneri and Lucy Spence

Identification of Early Predictors of Adult Learners' Academic Performance in Higher Education

Sylvia Chong Nguik Yin

Abstract

Universities are inundated with detailed applicant and enrolment data from a variety of sources. However, for these data to be useful there is a need to convert them into strategic knowledge and information for decision-making processes. This study uses predictive modelling to identify at-risk adult learners in their first semester at SIM University, a Singapore University that caters mainly to adult learners. Fourteen variables from the enrolment database were considered as possible factors for the predictive model. To classify the at-risk students, various algorithms were used such as a neural network and classification tree. The performances of the different models were compared for sensitivity, specificity and accuracy indices. The model chosen is a classification tree model that may be used to inform policy. The implications of these results for identification of individuals in need of early intervention are discussed.

Keywords: predictive modelling; adult learners; higher education.

Introduction

The ease of data collection and advances in information technologies, such as storage capability, processing power and access speed, has enabled educational institutions to accumulate vast amounts of data. Universities and their enrolment offices are inundated with detailed applicant and enrolment data from a variety of sources, such as student demographics, professional experience and academic background. However, for these data to be useful there is a need to convert them into strategic knowledge and information for decision-making processes. Over the past decade, data mining has gained increasing attention in academia to generate data driven evidence (Koh and Chong, 2014). Data mining approaches can discover hidden relationships and patterns. These relationships and patterns can, in turn, be developed into models to predict students' performance and behaviour. The predictive models can develop knowledge and insights, on which informed and strategic decisions can be made.

The purpose of this study is to develop predictive models to identify early predictors of academic performance of adult learners who are enrolled in the part-time undergraduate programs at SIM University, Singapore. SIM University is Singapore's only privately-funded university dedicated to working adults. The University has provided pathways for many to pursue lifelong learning and higher education while balancing career, family and social responsibilities (SIM University, 2014).The research scope was developed in the context of the SIM University's enrolment process. The research is timely and significant because of the growing number of adult learners who are returning to higher education (Macfadgen, 2007). his paper focuses on the factors that predict adult learners who may be academically at-risk and proposes incorporating into the enrolment process a predictive model to identify potential at-risk students.

Context of Study

The profile of students in higher education is changing (Chong, Loh and Babu, 2015). There is an increasing number of non-traditional students – these are students who are not in the group of 18-22 year-old full-time undergraduates (Wyatt, 2011; Macfadgen, 2007). There are 13,369 adult students currently enrolled in SIM University (SIM University, 2014). This is significant, as more and more adults who have been out of school for some years are turning to higher education institutions to start, continue or complete undergraduate degrees. In August 2012, the Singapore government declared support for the continuing higher education sector by expanding and diversifying the pathways in higher education (MOE, 2012). The restructuring of higher education pathways and institutions ensures that Singapore develops a more competitive workforce. The Singapore government, in a bid to encourage and support lifelong learning and continuing education, has made available a range of financial support instruments such as government subsidised bursaries and tuition loan schemes for adult learners to take up part-time undergraduate programs in SIM University (MOE, 2012). SIM University must modify and target their enrolment and admission strategies to better serve this growing population of adult learners. It is important for SIM University to identify and profile students who will eventually succeed, as well as applicants who will struggle or are inappropriate for admission.

With growing participation adult learners in higher education, SIM University must sift through an increasing number of applications. Making informed enrolment decisions will require accurate data and analysis for evidenced-based insights and knowledge discovery. Incorporating into the enrolment process predictive models to identify potential at-risk students or student success is highly advantageous. A combination of an explicit knowledge base together with sophisticated analytical approaches and clear domain information can uncover

patterns, associations and/or relationships to support enrolment management. By analysing enrolment data, it is possible to develop models that will be able to predict the potential of in-coming students.

Review of Literature

The review of literature is organized in two parts. The first section includes an overview of the data mining process and its use in higher education. The second section provides a review of studies on predictors of academic performance in higher education.

Use of Data Mining in Higher Education

Data mining has emerged in the wake of higher education's ability to capture a rapidly growing amount of data to "develop models for improving learning experiences and improving institutional effectiveness" (Huebner, 2013). The data mining process is often initiated without any preconceived outcomes; it adopts a data analysis methodology (Chong, Mak and Loh, 2016) and is often interchangeable with the term Knowledge Discovery in Databases (KDD) (SPSS, 2009) with the aim of obtaining insightful and useful findings (Giudici, 2013). In its basic form, the data mining process is the extraction of the knowledge within large databases. The data mining process involves several phases among which are: data acquisition, feature selection and extraction from database, model development and pattern recognition using data mining techniques, model interpretation and knowledge generation. Data mining, used in higher education, can strategically combine selected institutional data and statistical analysis to generate information upon which students, educators, administrators and management can improve practices. This highlights the importance of data mining as an approach to build models by transforming raw data into usable knowledge and information (Giudici, 2013).

Chang's (2009) study used data mining techniques to develop a model to predict the academic performance of university applicants. The predictive model was developed based on variables taken from the university's integrated admissions system. The integrated system included databases on application, enrolment and student progress data. The study showed that the neural network and decision tree models developed were able to inform university recruitment strategies, as well as support institutional research. Ramaswami and Bhaskaran (2010) used a CHAID (Chi-square Automatic Interaction Detector) prediction model, based on a classification tree, to identify a set of predictive variables and assess the impact of these variables on the academic performance of university students. A pilot experiment with 224 students from two different universities along with 35 variables was conducted. The model showed a strong correlation between attributes such as location, school type, parents' education, secondary school grades and the students' performance at the universities. Kovacic (2010) developed prediction models of students' success based on enrolment data with statistical techniques such as CART (Classification and Regression Technique) and QUEST (Quick, Unbiased and Efficient Statistical Tree) classification tree methods. He concluded that classifying students based on pre-enrolment data helps to identify students who may be at risk, and recommended orientation, advising and mentoring programs to support these students.

The literature also indicated that algorithmic or data mining approaches to develop predictive models could provide notable results vis-à-vis traditional statistical modelling approaches (Li, Nsofor and Song, 2009; Bogard, James, Helbig & Huff, 2012). Vandamme, Meskens and Superby (2007) used decision trees, neural networks and linear regression for the early identification of three categories of first-year students: low-, medium- and high-risk students. Some of the demographics and academic variables of these students were significantly related

to academic performance. Such predictions are useful to identify and support students with appropriate interventions to improve their academic performance.

Predictors of Academic Performance

The antecedents to success in university prior to students' matriculating are well established. Evidence exists to show that pre-university academic performance has a significant impact on subsequent academic performance in university. The relationship between pre-university grades and university performance has been validated in studies (Iam-On and Boongoen, 2015; Adelman, 2006). Adelman's (2006) research on persistence points to the importance of both pre-university (high school) performance and the rigor of the high school curriculum. Iam-On and Boongoen (2015) affirmed the importance of pre-university grade-point average in predicting success in university. However, the predictive ability of pre-university school grades is different for different individuals and groups. Power, Robertson, and Baker (1987) showed that the correlation between pre-university/high school grades and Grade Point Average (GPA) at university is generally about 0.5. They also found that secondary school grades are not as predictive for mature students' performance as they are for school leavers' performance. According to Bhardwaj & Pal, (2011) personal, social, psychological and environmental variables have an impact on students' academic performance. Other variables such as living location, medium of teaching, mother's qualifications, and family annual income also potentially affects student performance (Bharadwaj & Pal, 2011). Demographic variables that have been found to be determinants of academic performance include age, gender, employment responsibilities, and student workload (Palmer, Bexley and James, 2011).

In addition, pre-university factors that are commonly associated with individuals most at risk include: low pre-university school grade-point average (Adelman, 2006), low SAT/ACT scores; minority status (Pascarella and Terenzini, 2005), low family education levels, and low family income (Eagle and Tinto, 2008). Other variables that contribute include non-cognitive factors such as motivation, aspirations (Eagle and Tinto, 2008), and tendencies toward social and academic integration (Braxton and Hirschy, 2005; Eagle & Tinto, 2008). These non-cognitive factors are also seen as predictors of academic performance. Investigating the interaction of more traditional risk factors, such as demographics, with early engagement indicators can lead to a richer understanding of the predictors of success for students.

Research Objectives

The key purpose of this study is to identify early predictors of academic performance during the adult learners' initial semester at university using a data mining approach. Through this, SIM University hopes to identify students or applicants who are academically at risk as early as possible. Decision trees are used to build these models so that appropriate enrolment and intervention strategies can be designed and implemented. Specifically the study aims to achieve the following research objectives:

- Identify characteristics that are available at application and early engagement variables of adult learners who are academically (GPA) at-risk in higher education
- Build models for early prediction of the academically at risk with the identified application characteristics and early engagement variables
- Evaluate these models using cross-validation

Research Methodology

Data Source

The target sample for this study was comprised of first-year students who started their part-time degree program at SIM University in January and July 2013. Data was extracted from an in-house student information management system which collects and catalogues data from numerous sources within the admissions office as well as in other divisions of the university. For the purpose of this study, a range of demographic and academic data was extracted for 2,392 students that fall within the target sample.

Data Understanding

In order to identify potentially useful and credible patterns in the data, several iterative steps were taken in the development of the enrolment model. Students with missing data were removed from the dataset because some data mining algorithms were not able to handle missing data. To assist with data understanding, profiling was also conducted to determine the proportion of at-risk students in relation to the overall student participation rates.

Profile. Students studying in SIM University were relatively equally distributed in terms of gender, with more than half of the sample being between 21 and 25 years of age (M = 26.5, SD = 4.98). 22.7% of the students were identified as at risk students based on their Pre-University Cumulative Grade Point Average (CGPA) (See Table 1 for more details).

Table 1. Profile of Sample Used for Modelling

	N	%
Gender		
Female	1147	48.0
Male	1245	52.0
Age		
21 to 25	1387	58.0
26 to 30	599	25.0
Above 31	406	17.0
At Risk Status		
At Risk	542	22.7
Not At Risk	1850	77.3
SIM University School		
SASS	546	22.8
SBIZ	848	35.5
HDSS	291	12.2
SST	707	29.6

Variables. Predictors for the study can be broadly categorized into the three following groups. The description of the variables is presented in Table 2.

- Demographic variables (gender, age, marital status, race, length of working experience]
- Pre-SIM University academic performance indicators (prior diploma school, diploma CGPA, years since they last studied, field of diploma study, relevance of previous diploma study to current degree, O-Levels English and O-levels Mathematics) and
- University variables (SIM University schools and Credit Units (CUs) registered).

Demographic variables. As a university dedicated to adult learners, SIM University's enrolment is typically characterized by a diverse student profile in terms of their race, marital status, age and working experience. In view of this, demographic variables are of particular interest as students at different life stages handle the demands of a university program differently.

Pre-SIM University academic performance indicators. The concept of students' innate academic aptitude and its impact on their ability to cope with the demands of a university

education has been discussed in literature (Pascoe, McClelland and McGaw, 1997). In view of this, proxy indicators like O-levels English and O-levels Mathematics, subjects that most students offer at national examinations were collected to represent the students' academic competence. In the same token, diploma GPAs and the field of their diploma studies may also serve as a good gauge of the student's aptitude in respective programmes.

SIM University variables. SIM University's programmes are offered by four schools that cover a range of disciplines: School of Arts and Social Sciences (SASS), School of Business (SBIZ), School of Human Development and Social Services (HDSS), and School of Science and Technology (SST). As it is likely that programs offered by each school required and emphasised different domain knowledge and skills, it is insightful to identify and study between-school differences on the students' academic performance. Course workload is another predictor of interest in this study. To capture course workload, the number of Credit Units (CUs) that the students registered for at the start of the semester is used as a proxy.

Table 2. Variables used for data exploration and analysis

Variable Role Level	Role	Description/ Type
At Risk Indicator	Target	Student academic risk status (binary: at risk or not at risk)
Demographic Variables:		
Gender	Predictor	Student gender (binary: male or female)
Age	Predictor	Student age at intake (numeric)
Marital Status	Predictor	Student marital status (binary: Single or Married)
Race	Predictor	Student race (nominal: Chinese, Malay, Indian or Others)
Work Experience	Predictor	Student length of working experience in months (numeric)
Name of Diploma Awarding Institution (DIP Institution)	Predictor	The institution that student obtained Diploma from (nominal: A, B, C, D, E)
Diploma CGPA	Predictor	Student diploma final CGPA attained (numeric: 0.0 to 4.0)
Years since study	Predictor	Number of years since student last studied (numeric)
Field of Diploma Study	Predictor	The diploma area of study that student previously graduated from (nominal: Engineering, Business,
Relevance of Diploma Study	Predictor	Whether student diploma field of study is relevant to the degree he/she is pursuing (binary: relevant or not relevant)
Mathematics "O" level Grade	Predictor	Student previous Math grades (ordinal: 1 to 9)
English "O" level Grade	Predictor	Student previous English grades (ordinal: 1 to 9)
SIM University Variables		
SIM University School	Predictor	The school which the student is currently enrolled in (nominal: SASS, SBIZ, HDSS, SST)
CUs Registered	Predictor	Number of credit units student registered for that semester (numeric)

Modelling

A binary target variable 'at risk' was also constructed where students with a CGPA score of 2.3 and below is flagged as at risk while those with a CGPA score of above 2.3 is flagged as not at risk. The threshold CGPA cut-off of 2.3 was used to be consistent with SIM University's practice of offering academic counselling to students with a CGPA score of 2.3 and below.

After data preparation, a data driven approach was used to select statistically significant predictors. Using IBM SPSS Modeler 14.1, a list of significant predictors was identified using Model Feature Selection node, Neural Networks, CHAID, C5.0 and CRT based on their statistical significance (p-value <.05). As each algorithm has its own computation methodology strengths, comparing the list of predictors chosen by different algorithms offered a balanced and insightful approach in short listing variables that are consistently important for subsequent modelling. This controlled for variable selection bias. The list of short listed variables was then evaluated based on inputs from the literature as well as by subject matter experts who have contextual knowledge of the workings of UniSIM and the Singapore education landscape.

In model building, the CHAID decision tree was chosen as the baseline decision tree among the other decision trees that were developed via different algorithms on the full dataset (N = 2,392). The selection of the baseline model was based on an evaluation of a basket of criterion which measured the models' specificity, sensitivity, accuracy, and G-mean (Kubat, Holte & Matwin 1997). Collectively, the different criteria represented the models' ability to correctly classify at risk students, correctly classify not at risk students, and measure the degree of closeness of predicted values to actual values and measure the trade-off between specificity and sensitivity respectively.

Subsequent to this, the team attempted to build a contextualised decision tree for UniSIM which could better the predictive performance of the baseline decision tree. In this phase, greater emphasis was placed on literature and domain knowledge whereby different predictors were used as the first tree splitting criterion. All these predictors were selected based on their statistical significance (p-value < .05) as well as their influence on the students' performance as observed from domain knowledge. After the alternative CHAID trees were grown, a 10-fold cross validation was applied to ascertain their stability and to prevent over-fitting. In instances of significant deviation in performance criterion the outliers were removed, a model was reconstructed and cross-validated using the same process. Lastly, performance criteria of all the alternative CHAID models were compared and evaluated. The final CHAID model which presented an optimal balance in its accuracy, stability in predictive performance and explanatory power was chosen.

Results and Discussion

Findings from Data Understanding

As part of data understanding, a cross-tabulation was done for each variable listed in Table 2 to understand the proportion of at-risk students compared to the student participation rates. The results of selected variables in Table 3 revealed some interesting patterns.

Table 3. Summary results of selected variables of the at-risk model

1st split criterion: DIP Institution	Institution A		Institution B			Institution C		Institution D		Institution E		
Probability of Sem 1_Outcome = at-risk	0.357		0.213			0.243		0.187		0.167		
2nd split criterion: DIP CGPA	**≤3.08**	**>3.08**	**≤2.09**	**2.09 to 3.30**	**>3.30**	**≤2.91**	**>2.91**	**≤2.09**	**>2.09**	**≤1.86**	**1.86 to 3.08**	**>3.08**
Probability of Sem 1_Outcome = at-risk	0.395	0.186	0.320	0.205	0.078	0.298	0.148	0.377	0.135	0.292	0.179	0
3rd split criterion: Varies	No further split		**Yrs since study end**	**'O' level English**	No further split	**Sch**	**Sch**	No further split	**Sch**	No further split		
4th split criterion: Varies			No further split			**'O' level Maths**	No further split		**'O' level Maths**			

The pre-UniSIM academic performance indicators such as Diploma CGPA, Mathematics 'O' level grades and English 'O' level grades, if the students had a lower poly GPA score (< 2.00) or weak 'O' level English and Maths grade (C6 or less), a higher percentage of the students were classified as at risk. It seems that the diploma awarding institution may have had some influence on the students' academic performance as a substantial percentage of graduates from Institution C are classified at risk (21.2%) compared to their participation rate (13.5%).

Evaluation and Validation of Model

Based on the confusion matrices presented in Table 4, the three alternative CHAID models offer a more balanced predictive performance than the baseline reference model given their higher G-Mean scores (defined as a Geometric mean of Specificity and Sensitivity (Kubat, Holte, & Matwin, 1997). Out of the 3 models, the DIP Institution model was selected as it offers comparable specificity and sensitivity indices with no significant trade-off in other evaluation criteria. In this instance, it is important that the model has a good hit rate (evaluated holistically based on specificity and G-Mean indices) since the   practical cost of

misclassification would mean that actual at-risk students would not be able to benefit from subsequent intervention strategies or support.

Table 4. Comparison of evaluation criteria on CHAID models with different factors as tree splitting criteria

	Reference Model	DIP Institution	Diploma CGPA	UniSIM Schools
Specificity	40.8%	50.9%	50.4%	48.7%
Sensitivity	84.8%	76.8%	75.4%	78.4%
Accuracy	74.8%	70.9%	69.7%	71.7%
G-Mean	58.8%	62.5%	61.6%	61.8%
Error rate	25.2%	29.1%	30.3%	28.3%

The chosen DIP Institution model was then tested for its stability and replicability using the 10-Folds Cross Validation method. The cross validation result that is presented at Table 5 suggests a reasonably stable model and consistent predictive performance.

Table 5. 10-folds Cross Validation Performance of the chosen DIP Institution CHAID model

	Chosen DIP Institution CHAID model	10 Folds Cross Validation
Sensitivity *Ability to correctly identify actual cases (true positives)*	76.8%	77.3%
Specificity *Ability to correctly identify negative cases (true negatives)*	50.9%	48.1%
Accuracy *Closeness of its prediction to the actual values (true positives & negatives)*	70.9%	70.8%
Error Rate *Proportion of incorrect predictions (true negative & positives)*	29.1%	29.2%
G-Mean *Geometric mean of sensitivity and specificity*	62.5%	60.1%

Upon examination of the final CHAID decision tree (see Figure 1), we find that the DIP Institution (x^2 = 44.66, p-value < .05) that the students graduated from is significant. It is also observed that the CHAID decision tree divides into three branches with a few DIP Institutions grouped together (for example, DIP Institutions A, B and D are grouped at 1 split, while Dip Institution E remains by itself). This could perhaps be attributed to a lack of comparable grading criteria adopted by different DIP Institutions. This is an indication that the quality of their prior academic preparation is an important influencing factor on the adult learners' ability to cope in the degree program in addition to their innate academic potential.

Figure 1. Final CHAID Model
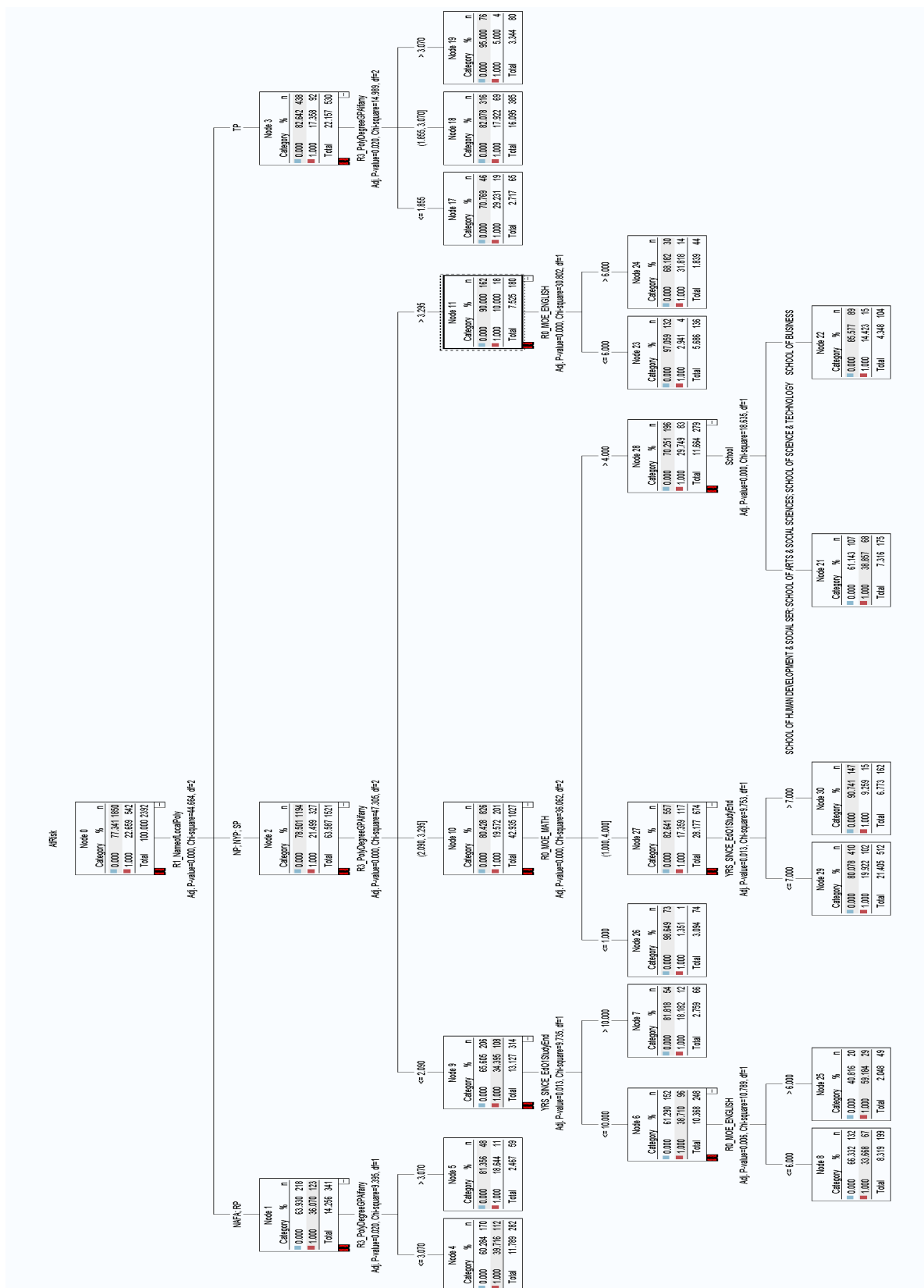
Implications and Application of Findings

In the CHAID model (see Figure 1), pre-SIM University academic performance variables: the Pre-University institution that the students graduated from, students' CGPA score and 'O' level English and Mathematics grades emerged as significant predictors of the adult learner's academic performance for the first semester. The finding that the pre-university institution that the students graduated from is a key predictor indicates that there is a wide variation in the standards of performance among the different diploma institutions. Singapore's education system is essentially centralized and standardized (Lo, 2014). This variation in academic performance standards among feeder institutions is an issue of concern for the University's enrolment office.

The quality and strength of the students' academic foundation prior to entering University impacts how they cope with the demands of a university program. The finding that pre-university diploma CGPA is a significant predictor of academic outcomes is consistent with Geiser and Santelices' (2007) study that concluded that high school GPA is consistently a strong predictor of four-year college academic outcomes.

The importance of a strong pre-university academic foundation is consistent with views that high school English and mathematics proficiencies are critical parts of undergraduate preparation for success. Research also demonstrates that language proficiency is correlated with academic success (Ellis, Chong & Choy, 2013; Gottlieb, 2006). Goldinch and Hughes (2007) investigated the relationships between students' confidence in their generic skills on entry to university, their learning styles and their academic performance in the first year. Their study highlighted a link between students' confidence with language and numeracy proficiencies.

The model developed in this study can be of assistance to university enrolment management in many ways. An awareness of how potential students may perform academically could lead to a more targeted marketing campaign. Promotional materials about academics, mentoring and student support resources can raise applicants' awareness of how these services can aid in adult learner transition to university. With the identification of significant factors that may affect the students' initial academic performance, universities can provide timely interventions through early identification and monitoring of possible at-risk students. A multi-pronged support structure may be more efficacious in assisting these students to remain in their degree program. Concrete steps, such as academic counseling may be offered to targeted students to maximise their learning and overall university experience. In this way, resources can be more effectively and efficiently targeted towards a comprehensive support for these students.

Future Directions

Although this study is limited in that it is based on SIM University's 2013 enrolment dataset the proposed model may serve as a baseline for future research. Another limitation of the present study is that the academically at risk status (operationalized as CGPA) was assessed for only a single academic year. There are three potential future research directions. Firstly, more variables could be included to improve the enrolment models as well as to develop other relevant models with reduced misclassification of students' academic performance. Other decision tree models and ensembles of models may also be explored as educational institutions exploit data mining for effective decision making, efficient operations and to improve teaching and learning (Koh and Chong, 2014). Secondly, there is a need to follow various groups of students, students who are at risk, transferees, withdrawals, as well as students who are high

performers. Including a time line in the analysis to follow these groups of students in subsequent semesters and tracking their study outcome would help to model their learning behaviour and patterns. Thirdly, aside from enhancing the accuracy of prediction, one of the directions for future research could be focused on using the data collected to identify and develop the support systems for teaching and learning.

Acknowledgement

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A Comparative Study of Discrimination in Education: The Learning Environment and Behaviours of Students and Teachers in Iran

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Abstract

It is the learners' right to get an education free from discrimination. Discrimination in education ranges from gender to race, age, social class, financial status, and other characteristics. In this study the focus is on discrimination in education in regard to social class and financial status. The paper describes observations of the school building layout and corresponding activities and behaviours in language education classes. The researcher observed 10 English language classes from different districts during 10 years from 2004 through 2014 and took notes on the activities and behaviours provided in the classroom to identify whether there was any correspondence with educational behaviours. The investigation in this study concluded that the language classes of most of the public (state) schools and some semi-private schools included a curriculum based on translation and memorization teaching methods. In these schools, learners exhibited stress and inattention that disturbed their learning. In these classes learners were threatened by laughing or rough criticizing by the teachers. The observation results were analyzed to make comparisons between schools and inform the level of equality in different schools.

Keywords: discrimination in education; language classes; parent; social class; financial status; curricular activities.

Introduction

It is important to recognize how quickly and how profoundly legal understanding of the concepts of 'equality' and equality law have changed and continue to change (Mountfield & Chambers, 2009). The current study aims at identifying the level of equality and discrimination in educational settings in a province in Iran. As Isaxanli et al. (2002) have stated, "among the changes occurring throughout the world is the requirement that social justice is gained in societies." In recent times, different ideologies and notions about social justice through education have arisen. Gordon Brown, prime minister in England believed that "It is education which provides the rungs on the ladder of social mobility." (Brown as cited in Smith, 2012, p. 2). Smith (2012) described a political perspective on educational equality following political economist Thurow (1980). In this perspective, the educational experiences of the poor prevent them from competing with better educated groups and social mobility stalls. Although there is a view that poor are poor because they failed to work hard and take advantage of educational opportunities, the moderate view is that the poor are poor because of inadequate education, inferior schools and disrupted families.

Different people need different considerations, quoting the Roman Emperor Justinian, "justice is the constant will to render to each his due" (cited in Miller, 2003 p.76). In other words, everyone should receive what they deserve. Do the poor deserve to be hungry, uneducated or sick? How can we realize who deserves what? Miller (2003) and Garner, Wagner, and Kawulich (2009) provide three concepts to consider: (a) if two students behave in a similar way, the punishment or reward should be similar; (b) the treatment should be relevant, for example a person should not be punished because his/her name begins with a specific letter; (c) the treatment should be proportionate, meaning that if we have to behave differently with different people that treatment ought to be in proportion to what they have done.

This study aims at investigating whether there is justice in educational conditions for learners in the Mazandaran province in Iran and to what extent the probable differences in social and financial status may be related to education discrimination.

Literature Review

The Significance of Education and Teaching Language in Particular

Education is a basic human right and very significant in the development of countries and societies. Having an appropriate educational situation for all children will assist in reducing poverty, diseases related to poverty, maternal diseases, and hunger. Education can lead to economic growth in the country. Michaelowa (2000) declared, "Education affects the life of individuals, their participation in economic activities, and overall economic development" (p. 1). It has been noted in UNESCO's pamphlet (2000) that everyone has the right to education and it shall be free.

In this paper, English language education and language classes are investigated. Language education is the teaching and learning of a foreign or second language. Globalization has created a need for communicating in multiple languages. An optimum learning environment is necessary to assist learners in the language learning process.

The Significance of Teachers and the Learning Environment

Teacher quality is very important in education. Many researchers have concluded that student achievement is affected by their teachers (Hanushek, 1971; Murnane, 1975; Amor, 1975; Park and Hannum, 2002; Rivkin, Hanushek, & Kain, 2005; and Aaronson et al., 2003). A study by

Earthman (2004) investigating student academic achievement and building conditions concluded that the quality of the physical environment significantly affects student achievement. In a review of school environments by Higgins Hall, Wall, Woolner, and McCaughey (2005) significant improvements in the learning environment was identified as leading to better attitudes toward teaching and learning.

The importance of the learning environment in language education led to the current study conducted to investigate the relationship between the possibility of education discrimination in language classroomlearning environments and the educational behaviours of both teachers and learners.

Educational Status in Iran

Education in Iran is divided into K-12 education and higher education. K-12 education under consideration in this paper is supervised by the Ministry of Education. The structure of the Iranian education system in schools is divided into the following stages: Pre-school Education (1 year in length, called *Pishdabestan*, is not compulsory), Primary Education (five years, called *Dabestan*), Middle school (three years, also called Guidance or *Rahnamaie*), and Secondary Education (four years, called *Dabirestan*). English as a second language is introduced from grade 7 (the beginning of middle school). In Iran, private schools were permitted to re-open in 1988 as non-profit institutions. Although education is free until the end of secondary education and compulsory for the first five years of schooling, there are differences between different regions in the country regarding the school facilities and programs.

The Importance of Comparative Studies on Education

Comparative education is a fully established academic field of study that examines two or more educational systems or situations in one country (or group of countries) by using data and insights drawn from observing the practices and context. Comparative international research is an attempt to understand local problems from a global perspective (Villalon, Suzuki, Hererra & Mathiesen, 2002). A list of quality measures helps to see a more comprehensive picture as well as make informed decisions about what is important and what should be modified, added or removed (Limlingan, 2011). As McNaught, Lok, Yin, Lee, & Song (2014) stated, although most comparative education research tends to contrast different curriculum and educational practices across different countries, internal studies are also helpful for considering the differences within the same national context. Attention to comparative education has increased significantly in recent decades; however, more comparative studies that include classroom observation are needed. This paper aims to make a comparative view in considering the significance of teachers and the learning environment through observations in English language classrooms.

Methods

In this study, the researcher compared four districts in a province in Iran (Mazandaran, located in the north of Iran) regarding their educational status in language learning. The target was to evaluate the extent to which variations among schools may lead to learners' and teachers' educational behaviors and to investigate education discrimination in different schools. The schools under study were selected based on three criteria: type and appearance. The selection method will be presented in the procedure section. In this article, the researcher aims at answering the following research question: To what extent do language teachers' and learners'

behaviours and their educational status in classrooms vary regarding the physical environment of the schools and the regions in which they are located?

The Participants

The language learners of ten schools in four different cities in Mazandaran province (figure 1) were selected for the study. Two of these four cities (figure 2) are located in the west of the province and two others in the east. 542,549 students are educated in primary, secondary, and high schools in Mazandaran. This province is one of the most important provinces in the country. There are 27,063 classes in its 6,043 schools. These four cities were selected in this province for the current study because of their geographical location. Two of them are located in the east and two in the west. As there are some cultural differences between west and east of this province, the researcher tried to select the schools in order to generalize the results to most parts of the province to some extent.

The participants were 260 learners who attended these ten secondary schools in Noshahr, Noor, Qaemshahr and Behshahr. All of them are in secondary school, year 3, and female. They were chosen among 80 secondary schools for female learners in the mentioned cities.

Figure 1. Mazandaran Province in Iran

Figure 2. Mazandaran Province and its selected cities for the study

The Procedure

The first step was to select ten schools out of the 80 *Rahnamaei* (middle schools). To do so, the cities of Noshahr and Noor in the west, Qaemshahr and Behshahr in the east were chosen because of their geographical location. Afterwards, three schools in Noshahr, three others in Qaemshahr, two schools in Noor and two others in Behshar were selected. There were two main criteria for selection: (a) physical environment and (b) type of school. Each of these main criteria were rated as excellent, medium or inappropriate.

Ratings and Coding

The buildings in the study were evaluated based on the layout, whether it is timeworn, new or refreshed. The facilities were identified: projector, whiteboard, blackboard, appropriate chairs, computer, smart board, and others. Based on these three criteria, the schools were identified as A, B & C. A for an excellent, B for a medium and C for an inappropriate physical environment. The locations of the schools were noted based on rural or urban. The types of schools in the province were coded according to public, semi-private and private schools (table 1). The school types ranged from 1 to 3. 1 was assigned for a public school, 2 for a semi-private and 3 for a private school. All the information were gathered by close observation.

Table 1. The selected schools in four cities in Mazandaran Province

Name of the City	Kinds of schools		
Noshahr	C1	B1	A2
Qaemshahr	C1	B1	A3
Noor	C1	A3	
Behshahr	B1	B2	

The researcher observed classes during the nine-month academic year during a period of ten years, from 2004 to 2014. Through these ten years, the researcher observed the classroom situations in her role as either teacher or examiner and took notes of behaviours and actions in the classrooms. The three schools in Qaemshahr were observed from 2004 to 2007. Behshahr, Noor and Noshar were observed from 2007-2009, 2009-2011 and 2011-2014 respectively. All of the selected language classes were held at 8:00 to 9:15 AM to homogenize the groups and reduce the effect of time on teachers' and learners' behaviours' in the classroom. It should be noted that based on the Ministry of Education in Iran, all the textbooks and contents of learning materials are the same, although the school facilities are different from one another.

Findings

During ten years of observing educational situations of these ten language classes, the researcher tried to take note of every behaviour and activity in the classroom. Researcher notes describing one session in three classes in C1, B1 and A3 types respectively are presented in the following.

C1 denotes a public school with an inappropriate physical environment, B1 denotes a public school with a medium physical environment, and A3 denotes a private school with excellent physical environment

Table 2. Activities of an English class in C1 school (public school with an inappropriate physical environment)

Activities of a sample session   Time: 8:00-9:15 AM
The English class began at 8:00 AM. The program was to ask questions about the previous lesson. Before asking, the teacher checked the learners' assignments and put a minus mark for everyone who does not have an acceptable homework. While checking the homework, a student was writing the proper answers of the questions of the book (page 7) on the board and others were copying. Afterwards the teacher called some learners to get ready for answering the previous lesson questions. The learners were asked to read the English text. Their pronunciation was not accurate but there was no correction or attention by the teacher. After asking questions, the teacher wrote "How many" and "How much" on the board and made two questions by them. Then she answered the questions by "a little," "a few," "some," "much," "many," and " a lot of," respectively. Then she asked the students to read the conversation in their books using "how many" and "how much." She read aloud the sentences in the dialogue and translated them sentence by sentence. She did the same for the reading and patterns sections of the textbook. The teacher used criticism and laughing for those learners who made some mistakes while reading. She used some penalties for those who did not do their homework well that would range from writing that part twice to sending them to the dean's office for punishment. She threatened the weak students that she will read their names aloud in front of all of the other learners in the school as weak ones. The considerable factor was the teacher's action toward penalties. She did not pay enough attention to them while checking and it caused the writing of the same errors several times by learners. While observing learners' behaviors in the classroom, the observer could often see cheating, inattention and stress.

Table 3. Activities of an English class in a B1 school (A public school with a medium physical environment)

Activities of a sample session   Time: 8:00-9:15 AM
The class began at 8:00 AM. The teacher started to teach grammar and asked the learners to take notes in their notebooks. She was teaching adverbs and adjectives. After writing the notes on the board, she waited for some minute to let the learners write them. She walked among learners to solve their probable problems. She taught structure deductively. Afterwards, she asked learners to make some sample sentences with selected adjectives and adverbs. Then she referred to the sentences in the book and asked the learners to find adjectives and adverbs there. She translated the sentences after reading. Then she identified the homework for next session. She asked them to prepare a wall-newspaper about this lesson in groups. The important learners' behaviors were memorization, and a little stress in the classroom. The point that attracted the attention of the observer was the environment of the classroom. All of the walls were covered by student made, colorful wall-newspapers about different lessons.

Table 4. Activities of an English class in an A3 school (a private school with an excellent physical environment)

Activities of a sample session   Time: 8:00-9:15
The class began at 8:00 AM. The teacher checked the learners' assignments by the help of group leaders. Then she asked two of learners who did not do their homework to stay at the classroom after finishing the session to talk about the problem. After addressing the homework problem, she asked the class to watch a short film about time travel and asked them to talk about it. She warmed up the discussion by asking some questions such as, "What occurred in the film?" and "Do you think it is possible to travel in time?" The learners were involved in the teaching process. They could laugh and talk aloud without any stress. The teacher used the Smart Board to show a PowerPoint about time travel to teach future tense. Afterwards she distributed information about some famous teams in the country and asked the learners to predict the probable results of the plays using future tense. The assignments were done in groups and the best predictor group was encouraged by rewards. The learners were collaborating with each other in the class freely. They could walk in the class and asked the other classmates' assistance. The teacher walked among them to solve probable problems. After finishing the activity, for the next session, the teacher asked the students to write a composition about what they expect to be in the future.

Four cities were considered in this study from different geographical parts of the province. Five schools were selected in the west and in the east among 80 schools in the district. The differences between these ten schools in Mazandaran province in Iran were identified. Although there were some differences between all of the classes, the similarities between public schools and some semi-private ones were distinguishable in contrast with private ones. Most private schools had a well-prepared building and campus and afforded appropriate facilities for teaching. The teacher/learner activities in private schools included cooperative learning and rewards and discipline that fit the circumstances. The lessons were based on Communicative Language Teaching, engaging the students in lively discussions on interesting topics. The teacher/learner activities in the public schools and semi-private schools involved more memorization and isolated grammar lessons.

The teaching/learning activities in the ten schools can be thought of as a continuum with the A3, or private schools with excellent physical environments on one end and public schools with inadequate physical environments on the other end of the continuum, with some schools falling in between these two points. The private schools with excellent physical environments were found to have the following characteristics:

- Cooperative learning
- Understanding
- Less Cheating
- Considerable attention
- Reasonable teacher behaviours regarding learners' mistakes
- Student involvement in the teaching/learning process
- Cooperative teaching
- Meaningful learning

- Less stress
- Communicative Language Teaching (CLT) method

Most of the private schools tried to attract the best teachers and accepted more qualified learners. Some of the private schools had entrance examinations. The most important point was not the exam, but the tuition the families must pay for registering their qualified learners. In fact, even learners with excellent grades who could not afford the tuition, could not register. In other words, it is the learners' parents who afford their children with the best school facilities. In such schools most of the parents are educated and wealthy. Some of them even donate some equipment such as expensive Smart Boards to their children's schools.

The public schools with inadequate physical environments were found to have these characteristics:

- Translation
- Memorization
- Considerable Cheating
- Inattention
- Rough criticizing by the teachers
- Boredom
- Grammar teaching
- Repetition
- Stress
- Grammar Translation Method (GTM) or Audio-lingual Method (ALM)

As shown in table 5, the teacher and learner activities in classrooms vary according to differences in the physical environment and types of schools. The public schools more highly relied on the translation method and memorization, whereas the private schools were eager to implement Communicative Language Teaching (CLT). Semi-private schools are similar to private ones but differ in the amount of tuition and types of facilities. The tuition is less than private schools and higher than public ones. Although public schools only require a small fee for insurance and some other expenses in the beginning of the year, there are some parents in Iran that cannot even pay the expenses of a public school.

Table 5. The main characteristics of each of ten target classes and the teacher/learner activities

City	Qaemshahr			Behsahr		Noor		Noshahr		
Types of schools	A3	B1	C1	B1	B2	A3	C1	A2	B1	C1
Observation year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Class size	30	30	30	29	27	30	15	32	31	14
Main teaching method	Co-operative teaching	Structural teaching method and co-op teaching	Translation	Repetition and audio-lingual method	Translation and grammar teaching	CLT method and cooperative teaching	Translation and structure teaching	Communicative teaching	Audio-lingual method	Translation and memorization
Main learning activities	Group learning	Working in groups to promote their structural learning	Translation	Repeating and memorizing	Taking notes and memorizing	Working in pairs	Repeating and taking notes	Cooperative learning	Repeating and memorizing	Memorizing and translating
Main student problems	Not allowing the learners to work with the smart board because of big number of learners' in the class	Large class size	Persian interference in learning	Not remembering well the memorized items and having stress	Bored students	Not allowing the learners to work with the smart board because of the rule of the school	Cheating and inattention	Large class size	Boring situation	Stress and boring situation
Main teachers' problems	Teaching learners in different levels in one single class	Large class size	Not having enough ability in speaking English	Not enough energetic	Large class size	Teaching learners in different levels in one single class	A lot of number of weak students in the classroom	Teaching learners in different levels in one single class	Not enough energetic	A lot of number of weak students in the class

Conclusion

Quality education is the right of every child in the world based on UNESCO's disciplines and human rights (2000). Education can create a clear picture of one's surroundings and kindles the flame of curiosity and the ability to reason. Economically, the best jobs are provided for the best educated persons and results in a better quality of life. In other words, social and cultural deficiency in a country arises from the lack or deficit of education. Education is such an effective factor in improving society that it must be promoted through the expenditure of time and money. In this study, observations of language class activities were related to the physical and financial status of the schools. Based on the results of these observations, there is a considerable gap between language class activities in different schools based on their physical status and the school types. This provided an answer to the research question: To what extent do language teachers' and learners' behaviours and their educational status in classrooms vary regarding the physical environment of the schools and the regions in which they are located?

Limitations of the Study

More schools and classes from all over the country or even the world would allow for more helpful and generalizable results, but it was not possible for the researcher to include more schools or classes. Some potential school observations had to be dropped because school cooperation was difficult to attain. A suggestion for the future is another longitudinal study of teacher and learner behaviour in different classrooms encompassing a larger population using comparative research methods to achieve more generalizable results.

This study attempted to identify the relationship between the physical environment and types of schools with language learning/teaching activities in the classroom. Further research can be done to investigate this relationship in other subjects in schools universities. The findings of such research can inform the amount of discrimination in education at all levels of education and its effect on the learning/teaching process. This study is one beginning step toward further research on the solutions and strategies for understanding the problem of discrimination in education.

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Assessing the Metacognitive Awareness among Foundation in Engineering Students

Betsy Lee Guat Poh, Kasturi Muthoosamy, Chiang Choon Lai, Ooi Chel Gee

Abstract

The transition phase is a critical moment to students who have completed their secondary school education and are proceeding to pre-university education in Malaysia. The long duration of exposure to rote-learning and examination oriented education systems at school has somehow shaped these students' perceptions about teaching and learning. Thus, this paper aims to examine the quality of first year students' experiences in constructing their knowledge and skills throughout the Foundation in Engineering (FIE) programme. This experience refers to metacognitive awareness, namely students' learning experience from one mode of thinking to the other to construct meaningful knowledge and skills. The researchers used the Metacognitive Awareness Inventory (MAI) (Schraw and Dennison, 1994) as a rating tool to trace the students' baseline in metacognition and access their successive levels of metacognitive awareness throughout their first semester in the FIE program. The students showed improvements in a number of metacognitive sub-processes. The findings provided the details of the quality of the program's efficacy and served as a benchmark for future development of effectiveness of teaching and learning approaches.

Keywords: metacognition; metacognitive awareness; teaching and learning; academic achievements; MAI.

Introduction

The term "metacognition" was coined by John Flavell (1979) to described the state of consciousness of one's own thinking and learning processes (Kayashima *et al.*, 2004). Learners exhibiting metacognition are acutely aware of the knowledge content in their mental resources and possess the ability to control and monitor these cognitive activities to perform higher-order thinking skills (Ozsoya & Ataman, 2009; Pennequin *et al.*, 2010). Thus, two essential components play a dominant role in the control of metacognition i.e. metacognitive knowledge and metacognitive skills (Hollingworth & McLoughlin, 2001). Metacognitive knowledge refers to what one recognizes about his or her own potential in processing information, about knowing the features of a task and also allocating appropriate strategies that can be applied to successfully accomplish a task (Flavell, 1987; cited in Hollingworth & McLoughlin, 2001). Metacognitive skills refer to the ability to use metacognitive knowledge effectively (Ozsoya & Ataman, 2009). Metacognitive activities help to control and monitor one's own cognitive system and functioning process. Self-regulation exercises commit one to demonstrate high order executive skills such as prediction, planning, monitoring and evaluation (Ozsoya & Ataman, 2009; Schneider & Artelt, 2010).

Engineers by definition are real life problem solvers, critical thinkers and innovators. It is expected from the engineers to develop solutions for various application problems. In other words, they are self-regulated learners and possess the ability to think metacognitively. The path to become an engineer regardless of specialization primarily relies on engineering education. Thus, the development of engineering students' thinking abilities highly depends on the teaching and learning process and the contextual learning environment during their academic years. This includes the exposure of students to various engineering concepts and hands-on experience to develop their technical skills. In other word, metacognitive skill is an integral part of the knowledge development that engineering students should cultivate and master as early as possible starting from the Foundation in Engineering (FIE).

Problem Statement

The transition period from school to university is a critical moment to upgrade students' ability to university students' status. Students' performance at the primary and secondary school level in Malaysia is constantly assessed by grade levels achieved in their examinations. In the process, they fail to develop an inquisitive mind and analytical skills as most of their time is spent attending tuition classes, extra classes, and examination workshops to better prepare them for the upcoming examinations. As a result, these students retain a rote learning mindset and studying pattern when they enter the university. These are the common issues observed in first year students at other institutions as well (Bowles et. al., 2011; Briggs, Clark & Hall, 2012). In order to provide the academic preparation of the first year entry in the FIE programme, the Foundation Engineering School has begun to review the performance of its programme to ensure that it provides students with top notch engineering education. Thus, this study aims to assess the FIE students' baseline and follow-up levels of metacognitive awareness throughout the program.

Literature Review

The importance of metacognitive awareness in teaching and learning has been widely acknowledged (Hurme & Jarvela, 2001; Ozsoya & Ataman, 2009; Schneider & Artelt, 2010; Stillman & Mevarech, 2010). Nevertheless, metacognition is an inner awareness rather than an observable behavior which is crucial to measure such ability. Several explorations have been carried out by researchers to discover appropriate instruments to measure the metacognitive

ability. Schraw and Dennison (1994) developed the 52 item Metacognitive Awareness Inventory (MAI) to measure adults' metacognitive awareness. The findings indicated that MAI provides a reliable initial test of metacognitive awareness among older students. Kazemi and Ghoraishi (2012) measured university students' metacognitive awareness in mathematical problem solving by using two methods i.e., protocol analysis and self-questionnaire. A total of 64 university students were asked to write their total mental process during problem solving and subsequently they responded to a metacognitive inventory that rated their metacognitive abilities. The results showed that both methods were applicable for measuring metacognitive awareness.

Self-questionnaire is the most extensively used method to measure metacognition, whereby it allows the participants themselves to rate their metacognitive skills without a researcher's interference. Young and Fry (2008) assessed Schraw and Dennison's MAI to ascertain how the metacognitive rating associates to single tests and cumulative GPA as well as end-course grades for college students within one semester. The findings revealed a significant positive correlation between the MAI and overall academic performance. However, they were amazed to discover the insignificant correlation between the MAI scores and a single test of a course. According to their report, single test performance might be influenced by the affective behaviors of students over a particular course. In another study, Kesici,Erdogan, and Özteke., (2011) examined differences in metacognitive awareness strategies in prediction of high school students' mathematics and geometry course achievements. Schraw and Dennison's MAI (1994) was also adapted in the study and discovered that declarative knowledge is a significant predictor of mathematics course achievement while evaluation and procedural knowledge of metacognitive awareness strategies are significant predictors of geometry course achievement. Ciascai and Lavinia (2011) employed the Junior Metacognitive Awareness Inventory to scrutinize the potential gender differences in metacognitive abilities among a group of eighth grade pupils. Their statistical analysis indicated that the boys and girls adapted differently in their metacognitive knowledge and skills in the learning process.

However, subsequent research reports inconclusive findings regarding the differences in metacognition according to pupils' gender. Abdolhossini (2012) reported the effects of cognitive and meta-cognitive methods of teaching mathematics subject for high school students. The results showed that cognitive and meta-cognitive methods of teaching had positive effects on educational progress of male and female students. Nevertheless, no positive relation was observed between the boys' and girls' average grades. Ayazgok and Aslan (2014) examined science and mathematics university students' reflective thinking skills and level of metacognitive awareness according to age, gender and the level of class and found that there was no significant difference according to gender regarding metacognitive awareness or reflective thinking. Thus, there are a variety of challenges related to metacognition investigation. For instance, Bersley and Spero (2014) compared three groups of college students who received different instruction methods of the same course material. They revealed that the group receiving direct infusion of critical thinking increased the students' knowledge of what they knew and did not know. In other word, the students' metacognitive awareness was stimulated through the act of intervening. Hoorfar and Taleb (2015) studied the correlation between mathematics anxiety and metacognitive knowledge for 323 seventh grade female students. Results showed that mathematics anxiety was negatively correlated with metacognitive knowledge. On the other hand, Bayat and Meamar (2016) investigated to what extend algebra problem solving performance, metacognitive strategies and cognitive strategies served as predictors of mathematics achievement in a public university in Malaysia. The findings revealed asignificant contribution of algebra problem solving performance and overall metacognition in mathematics achievement.

Thus, the purpose of this study is to trace the students' baseline in metacognition and access their successive levels of metacognitive awareness throughout their first semester in the FIE programme. In addition to this,, the researcher would like to measure to what extent the metacognitive awareness served as a determining factor to students' overall academic performance.

Methodology

In this study, a quantitative method was used. The quantitative data helped to tracestudents' baseline in metacognition and access their successive levels of metacognitive awareness throughout their second semester in the FIE programme. The researchers also examine to what extent the MAI scores served as a determining factor to students' overall academic performance.

Participants

173 surveys were distributed to the FIE students, out of which 75 were disqualified and 98 valid surveys were analyzed. About 23.5% of the survey participants were female and the rest were male (Figure 1). This is the usual female to male ratio in any engineering department. Although gender is sometimes perceived to be a factor in the outcome of the MAI scorea prior report (Abdolhossini, 2012; Ayazgok & Aslan, 2014) revealed insignificant gender differences on metacognition abilities, thus in this present study the gender factor has been disregarded.

The programme consists of three semesters and the study was conducted when the participants were in their second semester. There were six modules offered in Semester 2 i.e., Calculus 1, Mathematical Techniques, Computer Method, Electricity and Magnetism A, Thermal Science A and Study Skills. Study Skills was delivered as a project-based subject where the students worked in groups to organize a charity event such as a marathon, blood donation drive, concert and others. The aim of this module was to develop report writing skills and soft skills in order to prepare them for undergraduate studies and for future careers.
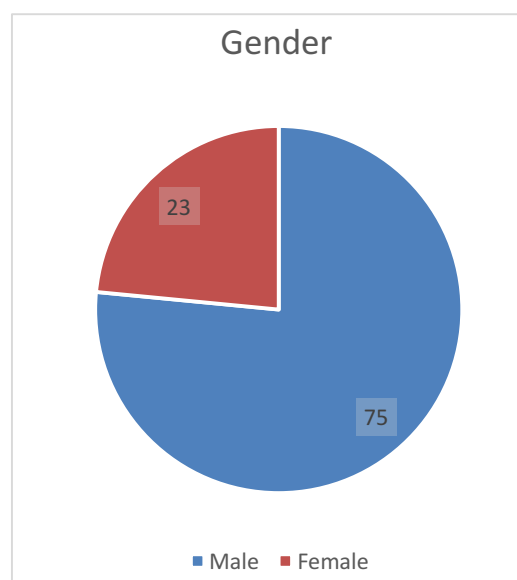

Figure 1. Gender Composition

Instruments

Schraw and Dennison's MAI (1994) was used in this study. In the MAI inventory, there are 17 items related to Knowledge of Cognition (declarative knowledge, procedural knowledge, conditional knowledge) and 35 items related to the Regulation of Cognition (planning, monitoring, evaluation, debugging strategies and information management strategies). The 52 items were measured by a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." A list of abbreviations describing the metacognitive components of Knowledge of Cognition and Regulation of Cognition is exhibited in Table 1 while Figure 2 shows the composition of questions in percentage for each metacognitive component.

Table 1. List of abbreviations representing the metacognitive components of MAI

Abbreviation	Meaning
IMS	Information Management Strategies
DK	Declarative Knowledge
M	Monitoring
P	Planning
E	Evaluation
PK	Procedural Knowledge
CK	Conditional Knowledge
DS	Debugging Strategies
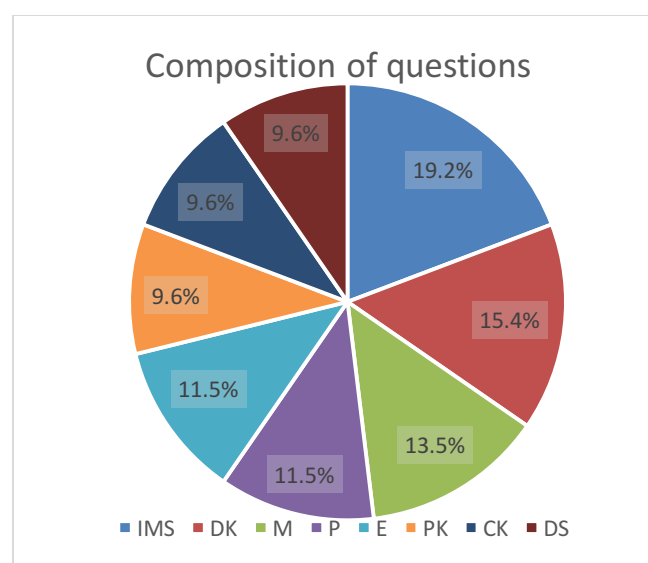
Figure 2. The percentage of items for each metacognitive component

Procedure

The participants were given the survey on the 1st, 6th and 10th week of semester two. An introduction about the study was presented to the students before the first survey was conducted. The participants were informed about the confidentiality of their responses and their participation was on a voluntary basis. During the second survey, the results of the first survey were reported to the participants and were explained briefly about their baseline in metacognitive skills. At the final survey, the students were given a brief statement about their metacognitive progression based on the second survey's results before they filled in the questionnaire.

Data Analysis

The quantitative data were analyzed using SPSS 15.0 to measure the descriptive status and distribution of the data set. In order to examine the significance of metacognitive awareness as an influential factor on students' academic performances, Spearman's Rho non-parametric correlation analysis was carried out.

Results and Discussions

Overall, there was a gradual increase in positive responses from Survey 1 up to Survey 3 (Figure 3), with a significant decrease in the Strongly Disagree sector.
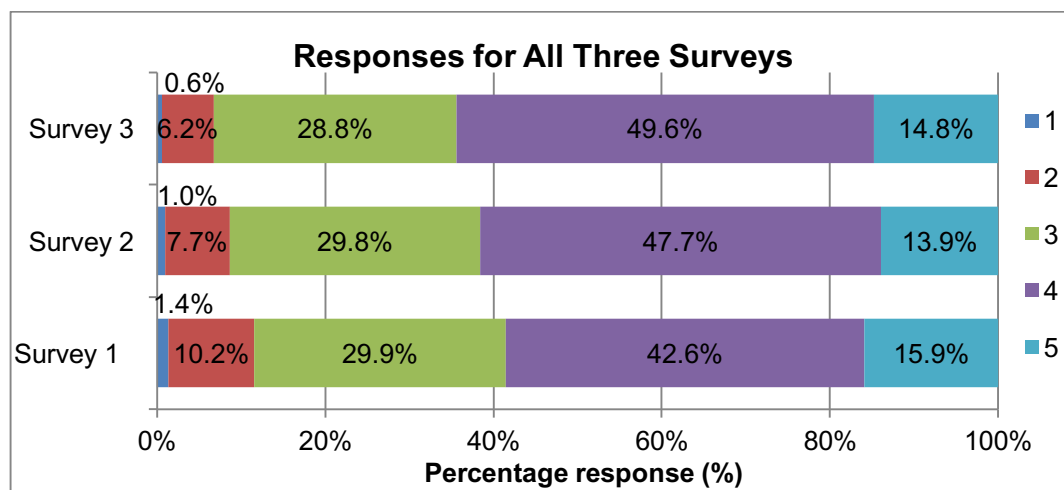

Figure 3. The distribution of the agreement and disagreement scales for the three conducted surveys

Note: 1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree.

Though no intervention was carried out in this study, the positive response is perceived to be due to students' persistent exposure to and awareness of the various skills in learning. The students were briefed about all the skills involved in metacognition during the three surveys. For instance, when Survey 2 was conducted, the students were given feedback on the overall MAI score in Survey 1 before they answered a series of questions reflecting their metacognitive awareness. Similarly, prior to Survey 3, feedback on Survey 2 was given with extensive explanation regarding the students' strengths and weaknesses. This could have initiated the students to recognize and reflect on their metacognitive abilities and explore unattained metacognitive skills throughout the whole semester.

The in-depth study focusing on the Knowledge of Cognition and Regulation of Cognitionfor both sectors showed a gradual increase in the mean score over the three surveys conducted as shown in Table 2. As aforementioned, with three surveys conducted within a short duration (one semester), the students were constantly reminded of the learning skills available for them to explore and enhance their learning experience. This could have played a role with the positive outcome on both sectors of Knowledge and Regulation of Cognition. Metacognition is a self-awareness ability, and students are often not conscious about their knowledge and skillsin the learning process (Kazemi & Ghoraishi, 2012).

Table 2. Mean and standard deviation of the MAI score

	Mean and standard deviation		
	Survey 1	Survey 2	Survey 3
Overall MAI score	3.62 ± 0.350	3.66 ± 0.322	3.72 ± 0.340
Knowledge of Cognition	3.56 ± 0.827	3.64 ± 0.753	3.68 ± 0.702
Regulation of Cognition	3.64 ± 0.822	3.67 ± 0.757	3.74 ± 0.713

Responses Difference between the Surveys

Figure 4 compares the score for all eight components categorized in the MAI based on Agree, Neutral and Disagree divisions. Initially, the students revealed their strong awareness, especially in their regulation abilities and their strength in debugging skills, which exhibited the highest. However, the ten weeks of teaching and learning sessions exposed the students to a variety of activities that added to their metacognitive knowledge and experiences. InKnowledge of Cognition, the level of agreement on the subdivisions, such as declarative knowledge and conditional knowledge showed a continuous increase. However, the students' opinion about their procedure knowledge decreased slightly after the second survey.
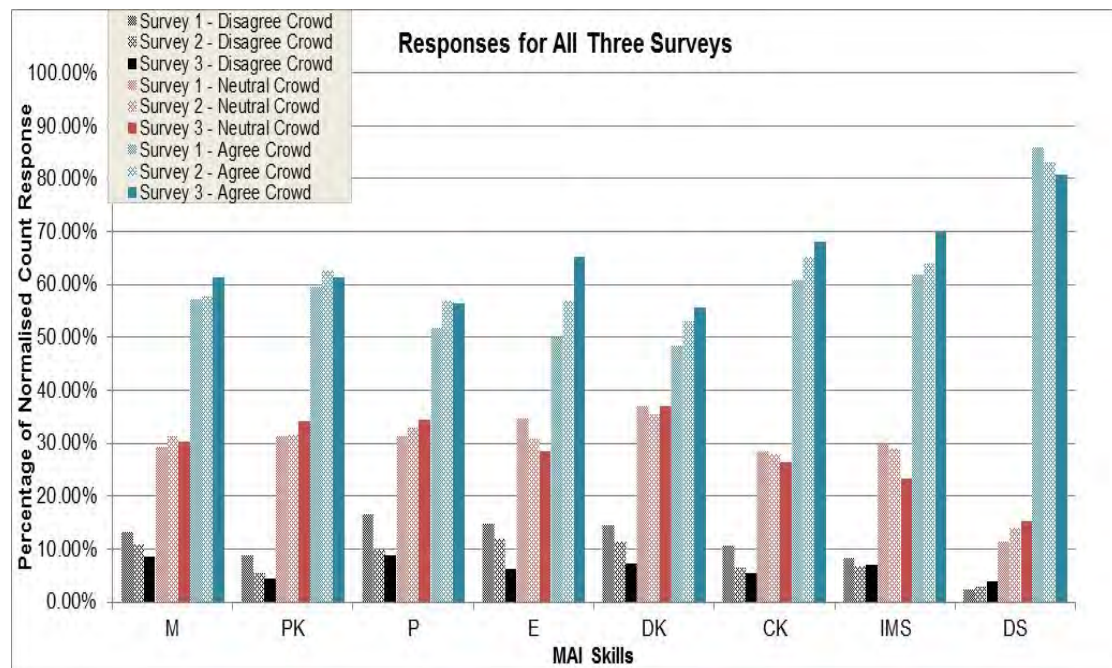
Figure 4. The breakdown of the responses of participants on the eight MAI skills based on three types of crowds (Agree, Neutral, and Disagree)

Regarding metacognitive experiences (Regulation of Cognition), the students showed greater abilities in management, evaluation and information management strategies. However, students' awareness about their debugging skills decreased over the three surveys.

The discouraging response for debugging skills could be due to the fact that initially (during Survey 1) the students were unfamiliar with the content and depth of knowledge required from each module as well as the lecturer's expectations. However, as the weeks of teaching and learning passed, the students began to realize the demands and challenges from each module and thus the low response in debugging skills. This would be especially felt in modules that require theoretical knowledge and applications (problem solving skills), such as Calculus 1 and Thermal Science A. Anxiety and low confidence has been found to be directly related to negative metacognition (Hoorfar & Taleb, 2015).

When responses between surveys were compared, more than 5% difference in the evaluation skills were observed between Survey 1 and 2 (Figure 5). In other word, the students showed higher positive responses when it comes to items such as "*I know how well I did once I finish a test,*" "*I summarized what I've learned after I finish,*" and "*I ask myself how well I accomplish my goals once I'm finished.*" On the other hand, the students' disagreement responses in terms of planning skills exhibited a difference of more than 5% between the two surveys.

Some students presented a lesser negative attitude toward planning when they responded in Survey 2. They seemed confident when they answered the items such as "*I pace myself while learning in order to have enough time,, I think about what I really need to learn before I begin a task,*" "*I set specific goals before I begin a task,*" "*I ask myself questions about the material before I begin,*" "*I read instruction carefully before I begin a task,*" and "*I organize my time to best accomplish my goals.*"
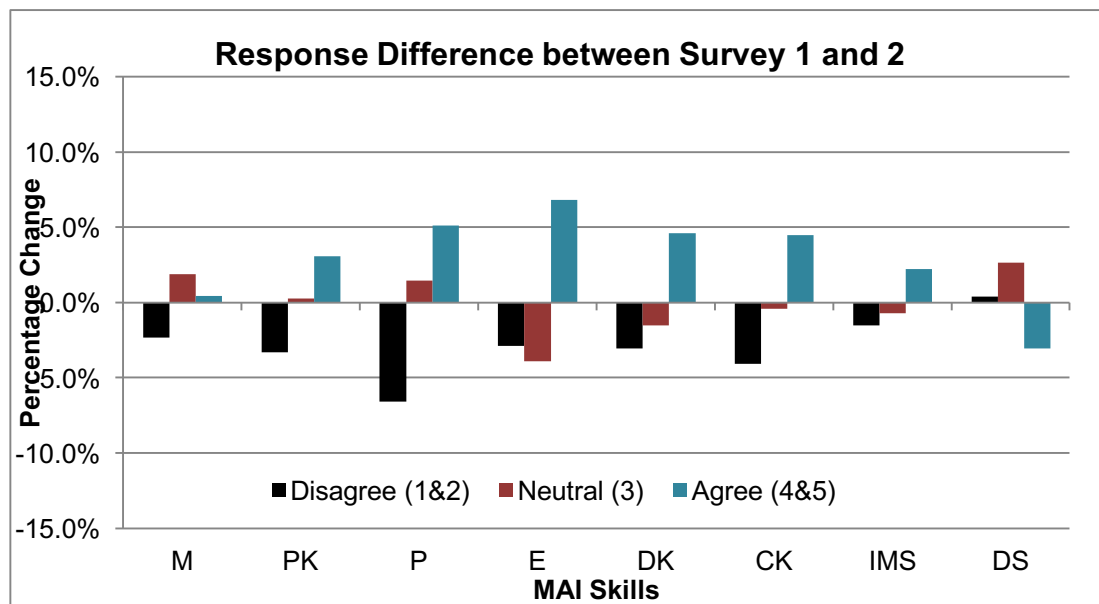
Figure 5. Differences in students' responses between Survey 1 and Survey 2

The students showed a decreased response in the debugging strategy after five weeks of teaching and learning sessions. The students seemed to be hesitant about their debugging strength when they responded to items such as "*I change strategies when I fail to understand,*" "*I re-evaluate my assumptions when I get confused,*" "*I stop and go back over new information that is not clear*" and "*I stop and reread when I get confused.*"

After the third survey, the students' responses in planning showed minimal differences i.e., less than 1% between the Survey 2 and 3 (Figure 6). However, many students focused on their strengths and weakness in their regulation skills, especially on monitoring, evaluation and information management skills. There were some students that felt their strength in evaluation improved over the ten weeks of teaching and learning sessions.

At the same time, some students were more aware of their information management skills and monitoring skills when they responded to the items such as "*I ask myself periodically if I am meeting my goals,*" '*I consider several alternatives to a problem before I answer,*" "*I slow down when I encounter important information*" and "*I consciously focus my attention on important information.*". Nevertheless, there was a tremendous drop in the students' confidence with the debugging strategy.
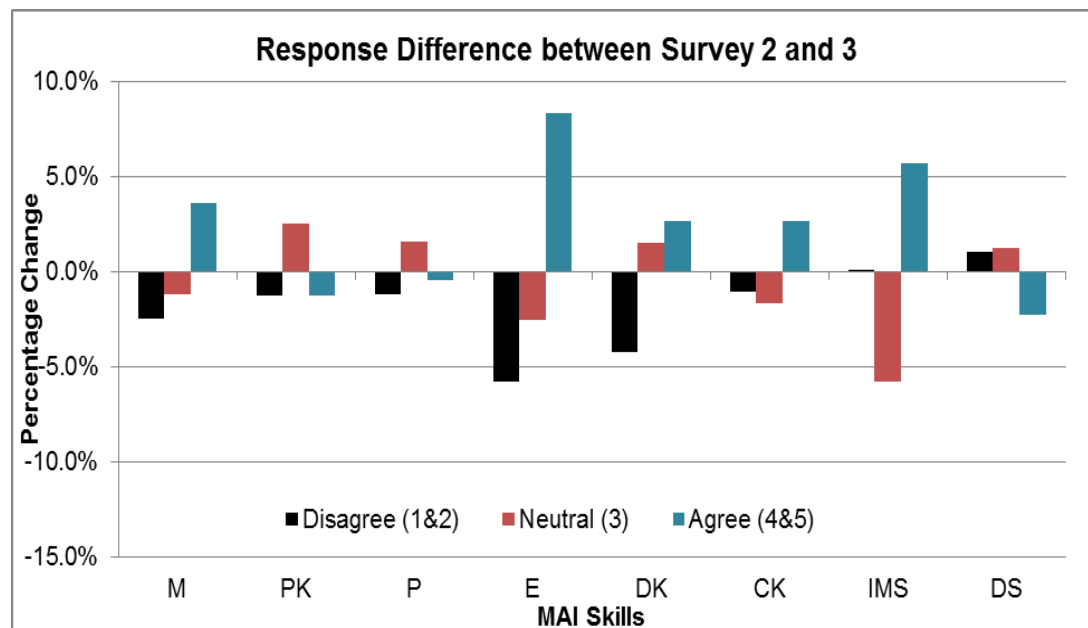
Figure 6. Differences in students' responses between Survey 2 and Survey 3

Obvious positive responses were seen for all the eight MAI components except debugging strategy (Figure 7) over the ten weeks of teaching and learning sessions. As there are six modules taught for the semester, there is a wide spectrum of learning skills experienced by the students. For instance, the Study Skills module, which is project-based, requires the students to organize a charity event focusing on management proficiency and related skills such as monitoring, planning and evaluation.
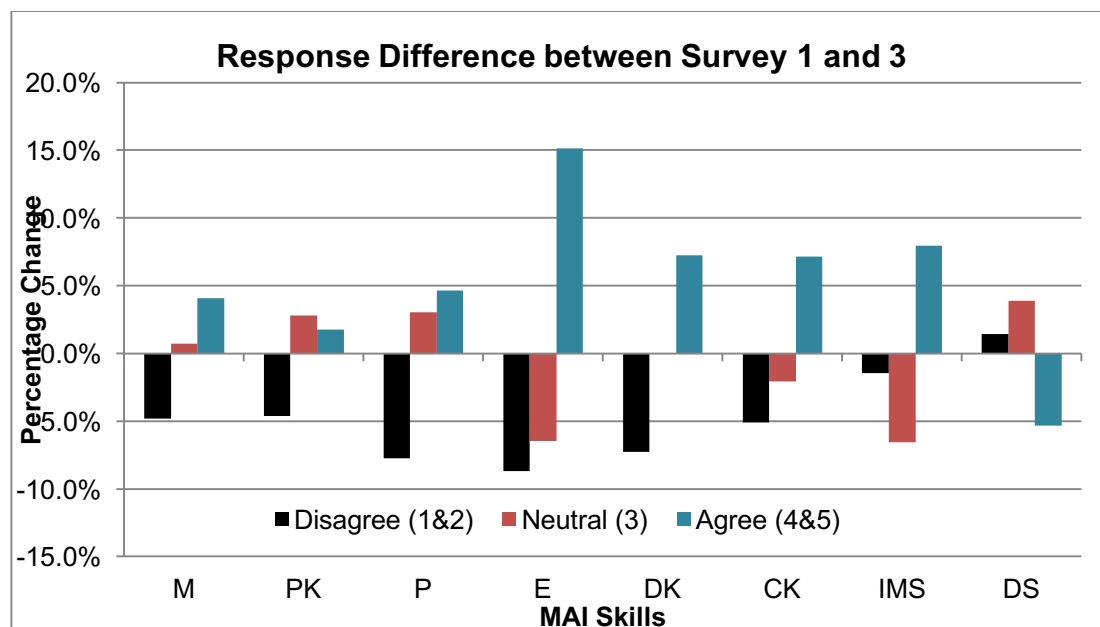
Figure 7. Differences in students' responses between Survey 1 and Survey 3

MAI Score and Overall Academic Achievement

A Spearman's correlation was conducted to determine the relationship between overall academic achievement and the MAI subscales. The MAI scores were based on survey 3 where

the students have completed their Semester 2 teaching and learning sessions. Findings from the analysis are summarized in Table 3.

Table 3. Correlations between MAI components' scores and overall academic achievement

			Exam Result	Mean M	Mean PK	Mean P	Mean E	Mean DK	Mean CK	Mean IMS	Mean DS
Spearman's rho	Exam Result	Correlation Coefficient	1.000	-.185	-.037	-.203[*]	-.054	-.013	.141	-.163	-.066
		Sig. (2-tailed)	.	.068	.717	.045	.595	.896	.167	.109	.520
		N	98	98	98	98	98	98	98	98	98

*. Correlation is significant at the 0.05 level (2-tailed).

According to the findings of the study, there was no significant correlation between overall academic achievement and all MAI components. However, there appears to be a weak correlation between planning and overall academic achievement $r = -0.203$, $p < 0.05$. This could be mainly due to the fact that this study serves only as an awareness program rather than an intervention to the existing teaching and learning delivery system. In addition, the survey was conducted based on all six modules in the semester, whereas a more focused survey on a particular module might provide a significant correlation between MAI score and academic achievement. As previously reported, interventions or direct infusion and continual reinforcement are necessary to improve the metacognitive skills among students, especially for mathematics subjects and subjects that require problem solving or critical thinking (Kesici *et al*., 2011; Bensley & Spero, 2014). In this case, intervention would be necessary to improve the students' debugging skills along with the other seven MAI skills. In addition, a mixed methodology (protocol analysis and self-questionnaire) would be needed to validate and substantiate the measurements of metacognitive awareness (Kazemi & Ghoraishi, 2012).

Conclusion

Based on the findings, the aim of increasing awareness among FIE students on their metacognitive skills is a useful tool for learning efficiency, critical thinking and problem solving (Kesici *et al*., 2011). There was an obvious improvement in the eight tested metacognitive skills based on preliminary (Survey 1), intermediate (Survey 2) and end of the semester (Survey 3) surveys, with the exception of debugging skills. Nevertheless, there was no relation between the MAI score and the overall academic achievement of the students. Despite this limitation, the current study serves as an awareness program for the students and as preliminary data for the lecturers. As a future study, intervention on a specific module will be carried out with great emphasis on improving the students' debugging skills.

Acknowledgement

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The Link between the Process of Change and Coaching in an Organization – A Case Study

Josephine Jim

Abstract

The aim of this case study was to highlight coaching in the process of change using a real life information technology and operational change project in an institution. It demonstrates the critical importance of coaching in change management, for successful change to occur.Any sustaining change requires ongoing coaching as an integral part of the process. The study heeds a call for adopting coaching to support organizational learning and change. It also attempts to open further research interests in the link between the process of change and coaching, and the benefits of coaching in change management today.

Keywords: organizational learning and change; change management; coaching for change; empowerment.

Introduction

Today's dynamic world is causing organizations, groups and individuals to reframe their view of what 'normal' is: 'Change is the new normal', or 'the new normal is continuous change' (Jorgensen, Owens, & Neus, 2008). Drivers of change can be positive or negative. They can be environmental or personal. They can be of external or internal environments. Changes of external environment can be due to factors like markets, legislation, competition and economy and all these will have consequences for organizations, such as its strategy development. Changes in strategy can lead to changes in the way the organization is structured, which can impact relationships, responsibilities and ways of working. The way in which change is implemented and accepted through the organization will be largely influenced by its leaders, their attitudes and behaviors as perceived by their subordinates. When there are changes in the work carried out, skills of the employees would have to be assessed. Usually, training is needed in order to cope with new skill requirements and coaching is also necessary to facilitate mobility (Gallwey, 2000) (Burke & Litwin, 1992). Changes of internal environment can include immediate working environment, such as a change in job, a new organization, a change in personnel, or a change in terms of conditions of service, which are likely to invoke a range of emotional and political responses from relevant stakeholders. Every organization has its unique culture, and culture change only evolves over time as a result of many other changes.

In the Executive Overview of the Best Practices in Change Management – 2014 Edition, the report suggests that two of the greatest contributors to success are: employee engagement and participation; engagement with and support from middle management (Creasey & Hiatt, 2014). The study reported that the main obstacles when implementing change projects were: changing mindsets and attitudes; lack of motivation of involved employees. The "soft stuff" was the hardest to get right (Jorgensen, et al., 2008). Therefore, the most significant challenges are people oriented, motivation is the key to effective change, and to maintain motivation in the pursuit of change is a real challenge (Burke & Litwin, 1992). Regarding motivation, a coach can play a pivotal role in facilitating the change process (Downey, 2003).

The premise of this research was that change coaching supports effective change, among other valid supports (Bennett & Bush, 2014). The study aimed to establish the link between the process of change and coaching in an organization.The organizations is one of the leading institutions in professional and continuing education and where coaching is not a common practice in the workplace. Using a real-life project example to demonstrate how a coach facilitated the change process, maintained motivation throughout changing events, the study examines change process related factors pre- and post-coaching.

Coaching for Change and its Assessment

Coaching is an effective skill for helping individuals and groups change, and coaching for change can have an impact on the organization or system (Bennett & Bush, 2014). While the efficacy of coaching is still not well understood, the AMA/Institute for Corporate Productivity Coaching Survey 2008 reported that two of the main reasons behind the termination of coaching assignments were: the inability of certain employees to change and the difficulty of measuring return on investment (ROI) (Amercian Management Association, 2008). 'Coaching engages with people, the essentially human nature of coaching is what makes it work – and also what makes it nearly impossible to quantify' (Sherman & Freas, 2004).

One way to track the benefits associated with coaching is through the use of assessments. The critical lesson for coaches is to administer these assessments in a pre- and post-test format (Amercian Management Association, 2008). Though there are several different ways

organization can use coaching, the most commonly used method of coaching is to make it an integral part of a supporting program.

Background of the Case Study

Introduction of a new Student and Course Record System

This case study involved a tertiary education institution in Hong Kong (called the Instituttion hereunder). The Institution was experiencing rapid growth, therefore to support the academic development and operation of the Institution, the Academic and Management Board had decided to partner with Cloud Business Services to implement a new Student and Course Record System in 2013. The author was a member of the Steering Committee participating in the strategic planning of the project. Several rounds of discussion were held with the Institution management to analyze the situation, plan the change process and to advise the management on anticipated hurdles in the process of change.

Understandings from the discussions were: when introducing an initiative – a new information technology system, it required staff to change the way they think and do things within the Institution. These disturbances to their behavior or thinking were likely to be met with resistance in some form (Prochaska, Norcross, & Diclemente, 2006) to bring about changes in behavior, a pervading change in context was required (Palmer & Whybrow, 2008); and to change behavior at the individual and organization level, the expectations, individual roles, behaviors, hierarchies and coalitions that existed within the systems of the organization needed to be examined and made more flexible (Peltier, 2001). According to Peltier (Peltier, 2001), below are opportunities or ways that coaches can help:

a. When big things in the organization change
b. Skill development for individual/group transitions
c. Specific skill development
d. Resolving specific problems

The Institution management, as the change sponsor, recognized the new system would be important in the Institution, the staff would have to go through stages of learning and skill development, and finally, they would benefit from an improved work flow with greater ease in administration, record keeping and retrieving, and enhanced technological skills. This is a directed change project driven from the top of the organization and relies on authority, persuasion, and compliance (Kerber & Buono, 2010, Spring).

For this project, the Institution management had established a change team infrastructure (Galpin, 1996) – Figure 1, to manage the process of change in order to make the implementation of the new system a success.
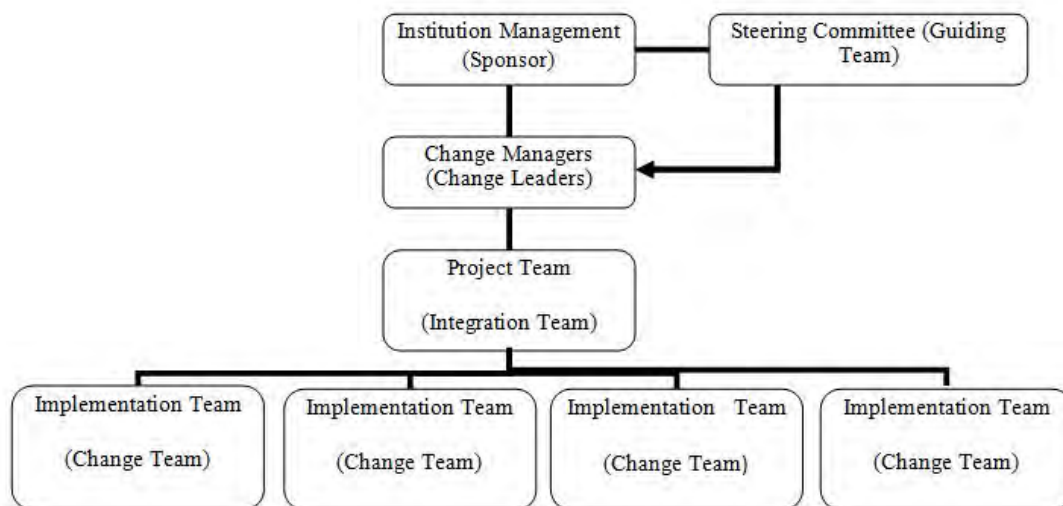
Figure 1. The Change Team Infrastructure (Galpin, 1996)

The author was in the Steering Committee which was guiding the coalition roles. The change sponsor appointed two Change Managers. A Project Team was also appointed since the project was for large-scale change. The Project Team coordinated across the Implementation Teams, identifying and resolving issues. Its members were the leaders of the Implementation Teams. The Project Team provided a coordination function, offering a regular forum for communication and learning among all the teams (Bennett & Bush, 2014).

The Change Managers had conducted a few change agent engagement zessions, followed by a series of fundamental change briefing sessions and system live demo to the change agents, whereby the concepts of the new system were explained, and upcoming changes on the operation processes were highlighted. In this change project, the Change Managers focused on several critical areas: communication, employee involvement, teamwork and change management (Palmer & Whybrow, 2008), and managing the transitions (Bridges, 2009).

During change, the Change Managers advised the Institution management to repeat the message again and again–emphasizing the need to change and the benefits of the new system. A website was established to introduce the background of the project and the newsystem, the change sponsor, the change agents and the system partner, the go-live schedule of the system and the project status. Newsletters were distributed to all stakeholders regularly to update them on the progress of the project, and to announce interim victories and the ultimate success.

Employee participation in the system design workshops and meetings were highly encouraged during the core system design stages because the Change Managers believed that participation gave substantive benefits for both individuals and the school. It was believed that when the staff saw that their input was valued, they would increase their commitment, involvement, and take greater personal responsibility for the new system outcomes (Palmer & Whybrow, 2008).

During change, people went through a series of stages and emotions (Kubler-Ross, 1973):

Pre-contemplation /Denial

The Project Team at the Institution faced a lot of changes in work load and project priorities and they did not believe in the urgency of the new Information Technology system. Program

administration teams in the Institution did not want to accept the new system and expose themselves to the new and long journey ahead.

Emotional arousal – anger, bargaining, upset

After acknowledgment, some project team members asked questions such as "Why now?" "Why me?" "Why not employing somebody else to do the additional work?" When they came to meetings, they revealed that they did not want to accept the changes in work arrangements and of wanted to do anything but get involved in the project. This caused frustration for those members who had already been convinced of the benefits of the project – the change sponsor, which included everyone in the management team and the change agents had the responsibility to implement the change.

Due to insufficient manpower for redeployment, some program teams started to bargain and requested to extend the duration of the project. This could have been due to panic, low confidence, or desperation. After many rounds of meetings on the project, project implementers were convinced of the need and were not going to escape from the situation. Nonetheless, they were still upset by the new arrangement of workload, which meant they would have to compromise some of their routines and were grieving for the loss that they were about to endure. This upset could take the form of sadness and emotions.

Contemplation /Acceptance

The Change Managers saw many team members move out of their denial, anger, bargaining and upset to a stage of acceptance. They were prepared to accept the reality of the situation, and the new and long journey ahead, but they were still uncertain about the impact of change and were in a state of anxiety.

A Discovery Journey of Preparation, Action, Maintenance and Termination

The end of the contemplation stage is signalled by a change in problem behaviors (Prochaska, et al., 2006). Helping relationships between partners, peers, team-mates, and subordinates played an important role during the preparation stageThe buisiest period of change was during the action stage, requiring helping relationships.

In this project, the Change Managers guided the project team to communicate and relate in a way that engendered commitment, responsibility and accountability.

Resistance was part of the territory of change (Palmer & Whybrow, 2008). It occurred when people experienced the discomfort and ambiguity associated with change. The Change Managers listened to all the resistance and addressed them in order to assist the staff to develop new behaviors and thinking. The strategies and techniques they adopted were repeating the communication; acknowledging and legitimizing feelings; raising awareness; supporting individual learning and development; building confidence and providing feedback; rewarding and acknowledging progress to provide support that utilized resistance and enabled people to change (Palmer & Whybrow, 2008). It was understood that resistance exists and and it is important to embrace it and use its energy to build support for change. (Maurer, 1996)

The Change Managers were leading the change by applying critical skills such as communication, presence, engagement, listening, showing empathy, understanding the change curve and negotiating resistance. They also consistently used sound change management strategies and techniques to move people through the change cycle (Palmer & Whybrow, 2008). They listened and agreed with the request that the change agents would need some

coaching in order to do their job well. They sought approval from the Institution management to hire an external coach to conduct a workshop – 'Team Building with Focus on Change Management' for the change agents. The objective was to equip participants with knowledge and skills in managing change in the teams through coaching. As the change sponsor, the Institution management had been pleased with the progress of the changing events, and had been very supportive in approving the recommendations made by the Change Managers.

Methodology and Findings

This article reflects on a change project in a tertiary education institution in Hong Kong from 2013 to present (it was on-going at the time of writing). The project covered changes in the process of a system revamp caused by drivers in the internal environment. Values and benefits of coaching for change reflected were a collection of feedback from relevant stake holders via formal surveys in pre- and post-workshop settings and informal sharing sessions. In this survey, multiple questions used the well-accepted Likert-type scale, with a 1 rating designated as "lowest/least" and a 5 rating designated as "highest/most." There were 9 questions in all, with a 10th question in the post-workshop survey. The questionnaires (Appendix I) had been designed to include below factors related to the change process described by Prochaska et al., (2009).

- clarification on the change process
- degree of emotion aroused in you
- degree of your resistance to the change process
- allowance to give feedback
- helping relations with your peer in the change team
- commitment to implement the change process
- sufficient knowledge and training on implementing the change process
- ability to manage the change implementation process
- confidence in implementing the change process
- enhancing the assertiveness in implementing the change process (only in post-workshop survey)

The questionnaires were distributed face-to-face before and after the one-day coaching session, and were to be completed by all participants in anonymity. The pre-workshop questionnaire was collected before the session started and the post-workshop questionnaire was collected immediately after the session finished. The scores for each question were organized in table and graphic presentation with focus on the differences in the pre- and post-workshop ratings. There were a total of 40 participants, including 14 who attended the first workshop and the other 26 who attended the second workshop. Participants were of various positions in the organizations: among them 13% were directors, 17% were managers, 17% were senior executive officers, 20% were executive officer, 13% were executive secretaries and 20% were executive assistants (Table 1). 20% were male and 80% were female (Table 2). With 36 questionnaires returned from a base of 40 participants, the response rate was 90% (Table 3). Differences in the score ratings of each question at pre- and post-workshop settings were presented in table 4 and graphic formats (Figure 2). And were calculated and expressed as percentage variance (Table 4).

Table 1. Background of Participants (Base: 40)

Position in the organization	
Director	13%
Manager	17%
Senior Executive Officer	17%
Executive Officer	20%
Executive Secretary	13%
Executive/Assistant	20%

Table 2. Gender of Participants (Base: 40)

Male	20%
Female	80%

Table 3. Response Rate (Base: 40)

No. of respondents	36
Response rate	90%

Table 4. Survey Results: Difference in Pre- and Post-Workshop Average Score and Percentage of Difference in Average Score

	Factors related to the change process	Average Score*		Percentage increase/ decrease
		Pre-workshop	Post-workshop	
Q1	Clarification on the change process	3.80	4.45	+17.1%
Q2	Degree of emotion aroused in you	3.06	3.21	+4.9%
Q3	Degree of your resistance to the change process	2.89	2.61	-9.7%
Q4	Allowance to give feedback	3.92	3.76	-4.1%
Q5	Helping relations with your peer in the change team	3.86	4.09	+6%
Q6	Commitment to implement the change process	4.44	4.39	-1.1%
Q7	Sufficient knowledge and training on implementing the change process	3.61	4.18	+15.8%
Q8	Ability to manage the change implementation process	3.64	4.30	+18.1%
Q9	Confidence in implementing the change process	3.67	4.15	+13.1%
Q10	Enhancing the assertiveness in implementing the change process (only in post-workshop survey)	-	4.73	-

* Likert-type scale, with a 1 rating designated as "lowest/least" and a 5 rating designated as "highest/most"
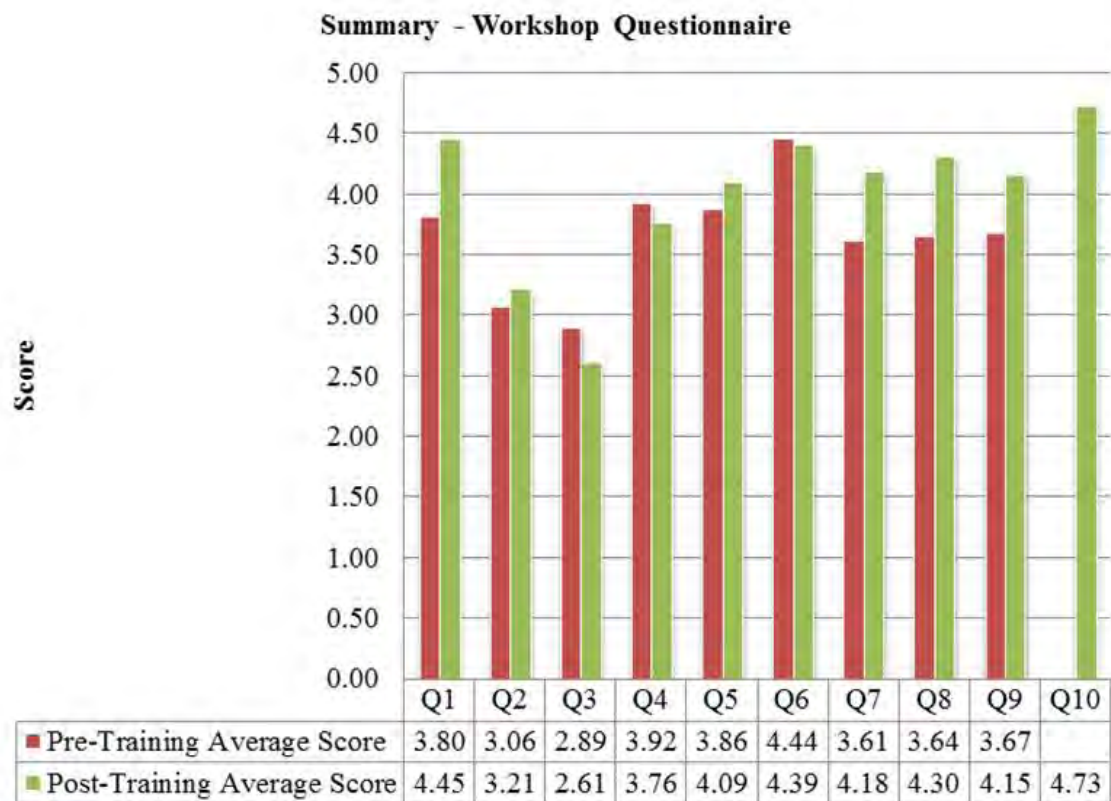
Figure 2. Survey Results: Difference in Pre- and Post-Workshop Average Score (Base: 40)

Remarks:	
Q1 – clarification on the change process	Q6 – commitment to implement the change process
Q2 – degree of emotions aroused in you	Q7 – sufficient knowledge and training on implementing the change process
Q3 – degree of resistance to the change process	Q8 – ability to manage the change implementation process
Q4 – allowance to give feedback	Q9 – confidence in implementing the change process
Q5 – helping relationships with peer in the change team	Q10 – enhancing the assertiveness in implementing the change process (only in post-workshop survey)

Upon administering the assessments in the pre- and post-workshop setting, the findings were as below. After the coaching workshop:

1. There was a 17.1% increase in the average score on "clarification on the change process" – the 2nd top benefit;
2. There was a 4.9% increase in the degree of emotion aroused in participants;
3. There was a 9.7% decrease in the average score on "degree of resistance to the change process" – the 5th top benefit;
4. There were only slight differences in the average score on "allowance to give feedback" (4%);
5. There was a 6% increase in the average score on "helping relationships with peer in the change team" – the 6th top benefit;
6. There were only slight differences in the average score on "commitment to implement the change process" (-1%);
7. There was a 15.8% increase in the average score on "sufficient knowledge and training on implementing the change process" – the 3rd top benefit;
8. There was an 18.1% increase in the average score on "ability to manage the change implementation process" – the 1st top benefit;
9. There was a 13.1% increase in the average score on "confidence in implementing the change process" – the 4th top benefit;
10. The overall average score on "enhancing the assertiveness in implementing the change process" after the workshop was high at 4.73, against a scale with a 1 rating designated as "lowest" and a 5 rating designated as "highest";

Examples of feedback from informal sharing session with randomly selected participants:

"I am happy being able to participate in the project from its design stage. As I have been with the Institution for more than 15 years, I am fully aware of the downsides of the current student record system and I do not wish to see the new system not meeting my practical needs in future. I have always been committed in implementing the change process and help my team-mates as much as I can. This workshop gave me extra opportunities to share my view with peers in the change team." – by A. Chan (See note)

"I appreciate the continuous communication and transparency of the change events so that I could brief new staff on the prospect of the new system, as they are complaining about the time they have to spend on working with the current system which has been obsolete for a long time! This workshop gave me an insight into coaching and equipped me with useful tools – listening and questioning skills, which would help me in dealing with my colleagues during the implementation process in future." – by B. Lee

"As change agents, we would have to guide and train other programme staff in the Institution on the new system when it is ready. We do not have any experience in handling changing project and the resistance to change which we may encounter. We hoped to receive some training and this workshop has given me extras strengths. And it has enhanced my understanding on a change process in an organization." – by C Cheung

Discussion

Coaching had been applied in the change processes in the above project with very positive feedback and appreciation from the Change Team. However, it only served as an integral part of the support program in the change process. The Change Managers recommended hiring an external change coach because they believed an external coach would have an independent perspective, credibility and experience to support and facilitate effective change. In addition, an external coach has greater financial motivation to succeed with their clients than does an internal coach (Bennett & Bush, 2014), and after all, senior leadership have already been heavily loaded with change work and related activities. However, the combined roles of project leader and coach, and change manager and coach in project examples of other organizations is not uncommon, it is common to see executives wearing more than one hat and performing multiple functions in parallel in this fast-moving working environment.

Since the number of participants of the workshop was 40, they were divided into two groups to attend the workshop in two separate days. Team coaching was selected due to budget reasons and also due to its anticipated benefits as described by Clutterbuck (2007), 'helping the team improve performance, and the process by which performance is achieved through reflection and dialogue' (Clutterbuck, 2007).

According to the survey in *Best Practices in Change Management* – 2014 Edition, two of the top five obstacles to success in change management in organizations are: resistance to change from employees; and middle management resistance (Creasey & Hiatt, 2014). The project example is a directed change project driven from the top of the organization and relies on authority at the top, persuasion in the middle, and compliance at the bottom (Kerber & Buono, 2010). In the pre-workshop survey, the resistance from staff was moderate at an average score of 2.89 against a scale with a 1 rating designated as "lowest" and a 5 rating designated as "highest"; and after the workshop, there was a 9.7% decrease in the average score of this factor, to 2.61, which exceeded the medium level. It indicates that more work has to be done in regard to persuasion in the middle. However, other supporting activities such as communication, employee involvement and managing the transitions may attain synergy benefits as a whole.

In this change project, coaching had been made as an integral part of a supporting programme. Change Managers listened and agreed with the request that the change agents would need some coaching in order to do their job well. Despite it was only a one-day workshop for each of the participants, the benefits for the group speak for themselves through the differences in the score rating on the factors related to the change process at pre- and post-workshop setting.

Suggestions for the Future

Further coaching intervention in future may be necessary to the processes of reinforcement and sustainment, as soft and people-related factors typically present great challenges in these processes. The development of the Change Managers to become internal coaches may add value in this situation, and using more cost-effective internal coaches would be useful for managers and supervisors. However, when training internal coaches, using externally based development programs or bringing in external talent as trainers may lead to higher coaching success (Amercian Management Association, 2008).

Combining coaching and change management could be very powerful in facilitating changes in an organization. 'Dealing with organizational change and dilemmas is not for the faint-hearted' (O'Neill, 2007, p.19). Just as sailors learn to read the wind in order to tack and open their sails, the Change Manager must read a few of the signs: key players, support change

agents, timing, go for understanding and keep moving. Only experience and a willingness to act as a coach of change is needed to be instrumental in change. The Change Manager also needs to have his or her own ongoing reflective space, in which to reflect on practice (Hawkins & Smith, 2006). And the Change Manager may expand this practice to include a blend of education and coaching, which would be a very powerful tool in facilitating a change process.

Conclusion

The results of the survey in the case study demonstrated the link between the process of change and coaching in an organization, and these linkages were as below:

- enhance the clarification on the change process
- increase in the degree of emotion aroused in participants
- decrease in the degree of participants' resistance to the change process
- enhance the helping relations with participants' peer in the change team
- increase in the level of knowledge and training on implementing the change process
- increase in the ability to manage the change implementation process
- enhance the confidence in implementing the change process
- achieving a high score in enhancing the assertiveness in implementing the change process after the coaching workshop

However, any sustaining change may require ongoing coaching as an integral part of the process.

Change becomes more important as an organization ages, because it keeps the organization and its management team updated, contemporary and risk sensitive. The business environment is changing rapidly and it is important for an organization and its people to be ahead of the changes, or at least excited to move along with them. Coaching is extremely helpful when an organization is aware of its needs to change, no matter whether the changes are being driven by an external or internal environment. In situations where people are trying to make changes at the emotional level, there may be push back, panic, a lack of confidence, avoidance or insecurity (Hawkins & Smith, 2006). A coach is a professional who has the skills to help others effect personal change.

Organizations are using a variety of methods to measure the success of their coaching initiatives. However, some observers believe 'coaching is not well suited to metrics' (Amercian Management Association, 2008). The observations and processes described and the reflections made in this article were based on a real life project in a sizable organization. Quantitative and qualitative reflections on practical cases can truly demonstrate the link between the process of change and coaching in an organization, and it is evident in this study that the link creates positive energy in the change process, especially in raising ability and confidence.

Limitations and the Need for Further Studies

The limitations of the study were: it was case study base; the sample size was small; the questionnaires had not been validated and the data collected had not been analyzed statistically. Nonetheless the premise of this research has been validated – change coaching is an optimal support to facilitate effective change (Bennett & Bush, 2014). The benefit of coaching in sustaining change in the case study is to be ascertained (the project was on-going at the time of writing). The article heeds a call on adopting coaching to support organizational learning and change, especially in education institutions where coaching is not yet a common practice in the

workplace. Further reflections, studies and or empirical research are warranted to foster the value of coaching in change management today.

Note

All names in the assignment have been changed to preserve anonymity.

Appreciation

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Ethics Issues of Digital Contents for Pre-Service Primary Teachers: A Gamification Experience for Self-Assessment with Socrative

Adolfina Pérez Garcias and Victoria I. Marín

Abstract

The knowledge society has brought many possibilities for open education practices and, simultaneously, deep ethical challenges related to the use, sharing and reuse of digital content. In fact, even at university level, many undergraduate students do not respect the licences of digital resources. As part of the contents of a third-year educational technology course for primary teacher training at the University of the Balearic Islands (Spain), prospective teachers learned about these ethics issues. During the 2015/16 academic year, 125 pre-service teachers from two groups of this course were involved in a gamification experience, using Socrative in real-time in the classroom, in which they had to answer different questions related to digital ethics. Its aim was not only to find out what they knew before working directly with the topic – an initial self-assessment – but also to arouse interest and encourage dynamic participation and interaction. At the end of the course, the participants answered a questionnaire in which they were asked about their perceptions of the use of this kind of educational strategy and their transfer in the future. Data were also collected from the same Socrative quiz and the final exam results related to digital ethics. Overall, the assessment from pre-service teachers was highly positive, as well as the scores of the questions related to digital ethics in the final test, and the conclusions of this study highlight both the importance of using more interactive educational strategies in the classroom and the need for training on digital ethics issues in teacher studies.

Keywords: gamification; higher education; teacher training; digital ethics; Socrative; self-assessment.

Introduction

The Internet has made it possible to access information and digital content to be reused in other contexts, which creates important ethical challenges (Farrow, 2016). Open education is especially interesting for future teachers of any level, who can create their educational materials by readapting the already available resources–images, sounds, videos and so on–on the Internet. However, the ethical challenges suggest that many student teachers do not respect the licences of these resources, mainly because they are not aware of them.

Digital ethics is a part of the digital competence that every teacher needs to develop (UNESCO, 2011). Thus, many teacher training programmes consider modules or contents related to this aspect. At the University of the Balearic Islands (Spain), the student teachers in the Primary Teacher Training program must attend a course on educational technology, which includes digital competence and digital ethics, in their third year.

During the 2015/16 academic year, pre-service teachers of two groups of this course were involved in a gamification experience using Socrative – a web 2.0 technology to create interactive tests–in real-time in the classroom to work on concepts and ideas related to digital ethics. The aim of this experiment was to connect teachers with their prior knowledge as an initial self-assessment, arouse interest and encourage participation. After the experiment, the participants were given a questionnaire in which they were asked about their perceptions of the use of this kind of educational strategy and their transfer in the future.

Therefore, the present work describes the educational gamification experiment with Socrative on pre-service student teachers for primary school; the results obtained from the same experiment; a final student questionnaire and the final test scores of the course (questions related to digital ethics). The conclusions show the value of the experiment and future lines of work.

Reference Framework

The educational experiment is based on two main topics: ethics issues of digital contents, as part of the digital competence; and gamification, as the didactic strategy used for the experiment.

Digital Ethics

The new technological and digitalized world comes with deep ethical challenges, especially related to open education (Farrow, 2016). Open education practices are based on four main principles (Valverde, 2010): (a) knowledge should be free and open to be used and reused, (b) collaboration in the construction and reelaboration of knowledge should be enhanced and promoted, (c) sharing knowledge should be rewarded for its contribution to education and research and (d) educational innovation needs communities of practice and reflection that provide free educational resources. The practices and technologies from educational contexts considered open could include access to educational or published research, software, policies, teaching methods, data sets or other educational resources (Farrow, 2016). However, the Open Educational Resources (OER) which are most considered in Teacher Education, are educational tools, learning contents/resources and implementation resources (licenses and interoperability) (Valverde, 2010). Although there are important advantages of OER, derived from the open education principles, there are also some concerns. Two of the main issues in Digital Ethics, derived from ICT dissemination on a large-scale, are privacy and the protection

of intellectual property (Maggiolini, 2014), which could be included as part of ethics and digital competences.

On the other hand, there is a need for students from different educational levels to develop these kinds of competences, including prospective teachers. New teachers must show competences that allow them to incorporate the digital world into the class–the use level–and enable them to behave coherently with the theory–the sense level (Burguet & Buxarrais, 2013; García-Gutiérrez, 2013). In fact, one of the areas to develop within the digital competences of teacher education (concretely framed in the information literacy) is digital ethics, which considers intellectual property rights, copyrights and ethics (UNESCO, 2011).

However, as Burguet and Buxarrais (2013) point out, training in the ethical dimension is lacking not only in the study program of teacher education but also in schools in general. According to the same authors, teacher training should include the development of the ethical capacities of educational professionals, who can in turn, secure the development of the autonomy of young students so that they can think and reflect by themselves, considering ethical issues of digital content. In this study, we focus on the work done within the university program for primary teacher training related to digital ethics in the module of technologies applied to education.

Gamification

Gamification is defined as the use of game dynamics, mechanics and elements in non-game contexts (Deterding, Dixon, Khaled, & Nacke, 2011). As the main advantages in the educational context, gamification affects students' behaviour, commitment and motivation, which can lead to improvement of knowledge and skills (Hsin Yuan Huang & Soman, 2013).
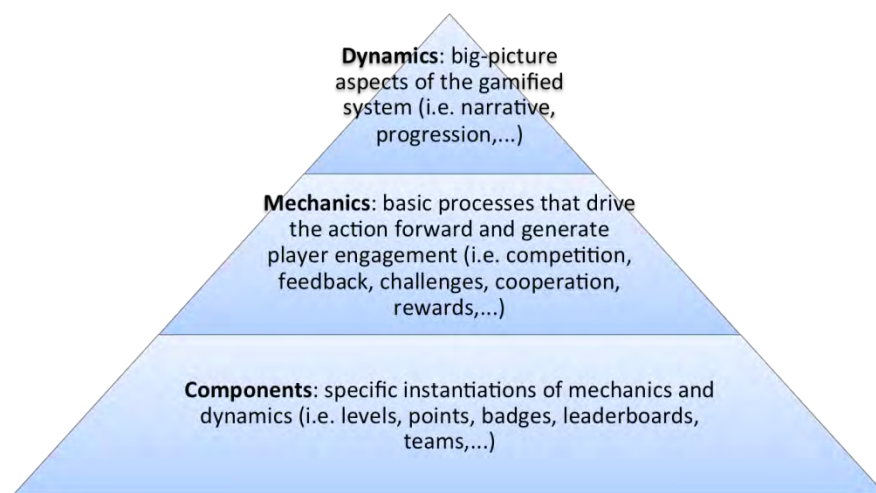
The game elements are shown in Figure 1:

Figure 1. The Game Element Hierarchy, adapted from Werback and Hunter (2012, p. 82)

Some of the more accepted game elements that can be used in the learning context are: points, numerical values given for any single action or combination of actions; ranking, a classification or comparison among students from the same class or year; levels, a system to show student's progress in the assigned activities; badges, distinct awards for the consecution of an objective; and progression, a dynamic in which success is granularly displayed.

In the educational context, gamification includes a range of activities that cover: (a) the incorporation of game rules and structures into class activities or management, (b) learning activities through didactic games or serious games and (c) the gamified development of complex didactic strategies, which include different activity sequences such as the resolution of a case in a learning problem/project-based methodology. The latter is associated with a gamification vision that differs from the classical vision called game thinking in which the goal of gamifying is to present a learning-teaching process centred on the students, where they (as players) get involved, make decisions, achieve progress, assume new roles, participate in a social environment and receive immediate feedback (Gallego, Molina & Largo, 2014).

In recent years, the number of courses that implement gamification strategies in higher education for different kinds of studies has been growing. These strategies are an effective way of maintaining undergraduate students' motivation, concentration and engagement in the curriculum, such as in technical studies (Barragán, Ceada, Andújar, Irigoyen, Gómez & Artaza, 2015; Iosup & Epema, 2014; Villagrasa, 2016), economics (Arias & Djundubaev, 2015), medicine (Martin, Martin, Sanz, & Martín, 2014) or educational sciences, including teacher training (Villalustre & del Moral, 2015; Shiota & Abe, 2015).

Among the ICT tools that can be used to introduce game mechanics and dynamics into educational contexts are webtools, platforms and software (commercial and free). Some of them are Badgeville (http://www.badgeville.com), Openbadges (http://openbadges.org/), Classdojo (http://www.classdojo.com), Atta (http://www.attacommunity.com), Schoology (https://www.schoology.com/home.php), Kahoot (https://kahoot.it) and Socrative (http://www.socrative.com/).

Socrative is a free webtool that allows teachers to create quizzes and use them in real-time to empower the engagement and assessment of students, individually or in teams. While the students are answering, the results are aggregated and visualised in real-time, which enables teachers to have instant insight into students' level of understanding concerning a specific topic related to the curriculum. This tool is very accessible as any device that has internet connection can use it (the teacher needs to provide students with a code).

In the current experiment, Socrative was used to identify the initial knowledge and possible misconceptions regarding digital ethics.

The Educational Experiment

Context and Methodology

The experiment was carried out with 125 third-year pre-service teachers in the Primary Teacher Training program at the University of the Balearic Islands in the course Media and Technology Resources for Teaching and Learning in Primary Education during the 2015/16 academic year. Student teachers were organized into two groups with different teachers. The course was organized using a blended modality: mostly face-to-face classes and the virtual learning environment Moodle. This support basically consisted of the delivery of online materials that were used for in-class work, study preparation or assignment submissions. The final assessment of the course included a final exam, which was focused on the theoretical aspects of the contents, and different practical activities.

The activity (described below) was done by using a computer, a projector, a whiteboard and the student teachers' personal technological devices (laptops and smartphones) and was

focused on a part of the theoretical aspects of the contents of the course. As in the whole studies program, the teaching and learning language for the activity was Catalan.

A gamified quiz was created using Socrative with 27 items related to digital ethics, including copyright and the right to use and reuse digital information, as part of the second content module of the course. The student teachers had previously worked in the first module with the concept of digital competence and its areas, one of them being information literacy in which digital ethics is included.

The quiz was composed of twenty-five statements about student teachers' knowledge, beliefs and personal use of digital information, in which twenty-three are a "True or False" type and two require multiple-choice responses. The remaining two were short answer questions. See Figure 2 for a template on the quiz in appendix 1.

Student teachers entered their names, answered questions and could not skip items or change their answers. Some of the student teachers worked in pairs to answer the quiz because not all of them had their devices in class.

After each response, student teachers received immediate feedback on the answers chosen–the system showed them if they were correct or incorrect providing a self-assessment. The feedback included a brief explanation of the correct answer and some references to consult related to the answer. As student teachers answered the quiz, the display of their progress with a table of results was shown on the class whiteboard in real time. At the end of the quiz, student teachers received information on their scores in relation to the scores of their peers.
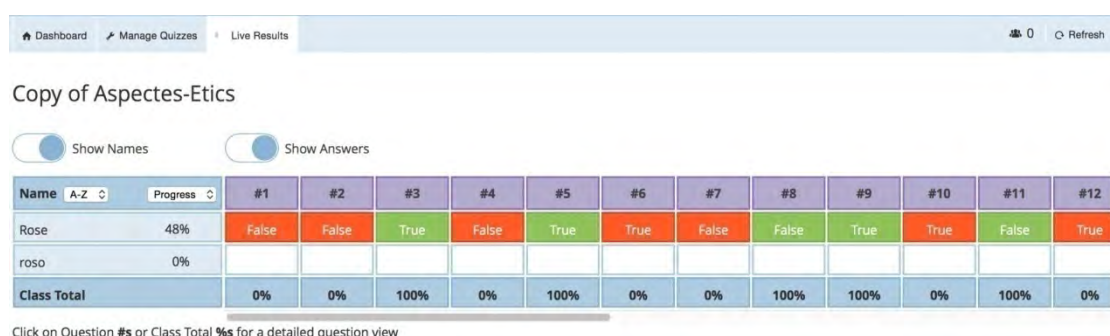
Figure 3. Screen of real time results of the Socrative quiz

The purpose of the quiz was to connect student teachers with their prior knowledge, arousing interest and encouraging participation. The didactic sequence was developed through two main activities in a 1.5-hour session:

1) First, the Socrative quiz was applied in the face-to-face class session. The student teachers answered the quiz individually or in pairs using their personal technological devices in 15–20 minutes. This part was related to self-assessment because student teachers received the feedback on their answers immediately.

2) After student teachers had completed the quiz, the teacher presented and assessed the global results by starting a dynamic participatory class on the topic. Once the questions were discussed and the answers justified, the student teachers posed new questions in the form of examples of use of digital information with the aim of consolidating their learning.

Results and discussion

To assess the experience, information was obtained and analysed based on: (a) the opinion of the student teachers through a final online questionnaire and (b) the score obtained by the student teachers in the Socrative quiz regarding prior knowledge of the ethical use of digital information aspects and examination of the subject.

The data obtained showed that the experience allowed pre-service teachers to connect with their prior knowledge and encourage them to reflect on it. The results of the quiz showed little prior knowledge and false belief, but the good grades obtained in the final test show the improvement of their knowledge of digital ethics.

About the Gamification Experiment

Data Gathered from a Questionnaire

Seventy-eight student teachers (out of 125) that participated in the educational experiment with Socrative answered a final questionnaire.

One of its sections was directed at assessing the learning activity carried out with Socrative, by focusing on its usefulness for encouraging learning and reflection, boosting participation and the student teachers' attitudes towards gamification strategies, which were the issues that the teachers wanted to enhance in their class (see Table 1).

Table 1. Questionnaire statements on the educational experiment with Socrative

Statements
The use of quiz or games to detect previous knowledge encourages learning and reflection
The use of tools to manage student participation in classes (random selection of students who will participate) would speed things up in a fun way.
Using badges in the working sessions of workshop (in the computer lab) would be a good strategy to motivate and track our activity in class

Therefore, first, student teachers were asked to score (from 1 to 5) their agreement with the statement *the use of quizzes or games to detect previous knowledge (as the quiz used on the topic of ethical uses of digital information) encourages learning and reflection*, 1 indicating disagreement and 5 indicating agreement. As can be seen in Figure 4, student teachers' answers (groups 1 and 2) show a high agreement (79.3%). To indicate if there were significant differences between the two groups, student teachers were also asked about their perceptions of the use of gamification strategies in other activities, such as for managing participation in classes and monitoring by using badges. The results show less agreement with the statements.
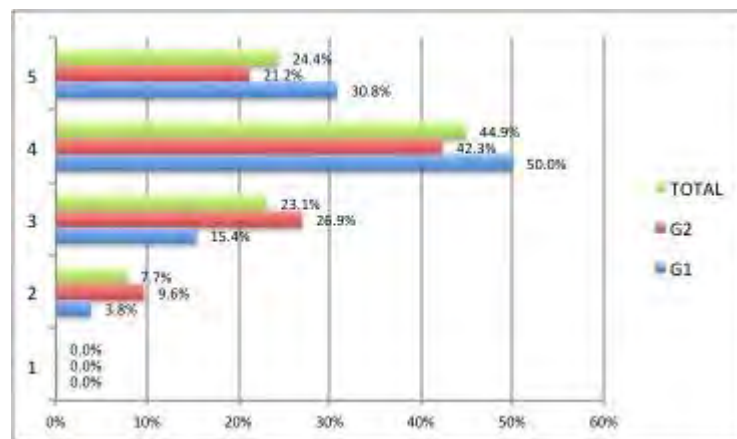
Figure 4. Results from the questionnaire on the agreement with the statement *the use of quiz or games to detect previous knowledge encourages learning and reflection.*

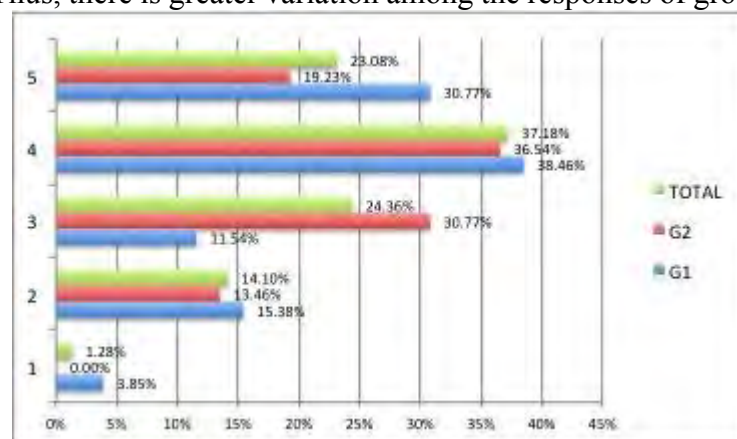Sixty percent of respondents showed a high degree of agreement with the statement *the use of tools to manage student participation in classes (random selection of students who will participate) would speed things up in a fun way* with a deviation of 1.18 points in group 1 and 0.95 in group 2. Thus, there is greater variation among the responses of group 1 (see Figure 5).

Figure 5. Results from the questionnaire on agreement with the statement *the use of tools to manage student participation in classes (random selection of students who will participate) would speed things up in a fun way.*

Similarly, 65.9% of their answers show a high degree of agreement with the statement *using badges in the working sessions of workshop (in the computer lab) would be a good strategy to motivate and track our activity in class* with a deviation of 0.8 points for group 1 and 0.7 for group 2 (see Figure 6).
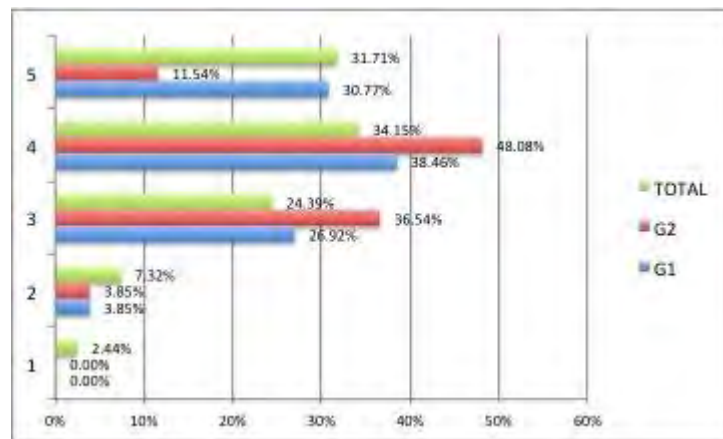
Figure 6. Results from the questionnaire on the agreement with the statement *Using badges in the working sessions of workshops would be a good strategy to motivate and track our activity in class.*

These results indicate that there are low expectations of student teachers in certain gamification strategies. Perhaps this could be explained by the lack of experience with this type of activity and the association of these aspects with games. This might shed light on the lack of knowledge related to gamification strategies in education.

Class Scoring

The total, averaged score of the Socrative quiz was 64% (64.3% in group 1 and 63.7% in group 2) with 16 correct answers out of 25 (15.4/25 in group 1 and 15.9/25 in group 2) (Table 2).

Table 2. Scores of the Socrative quiz on the ethical use of digital information

Total Score	Group 1 Score	Group 2 Score
64%	64.3%	63.7%
Total Correct Answers	**Group 1 Correct Answers**	**Group 2 Correct Answers**
16	15.4	15.9

As illustrated in Table 3, items with the highest percentages of correct answers relate to broader issues in digital ethics, and items with the lowest percentages include procedures or more precise aspects of the ethical use of digital information, which is especially important to incorporate in their educational practices as future teachers.

Table 3. Questions in the quiz with higher and lower percentages of correct answers

Statements with higher percentages of correct answers	
10. Using a fragment of a text segment to quote authorship is a communication act against an author's rights.	96.7%
16. Authors can authorise to distribute, copy or reuse the work.	92.7%
1. An author's rights of a work recognises intellectual property as a natural right to the individual creator.	92.2%
19. Creative Commons allows the authors to distribute their works with specific rights under certain conditions.	92%
Statements with lower percentages of correct answers	
12. A work is protected with copyright when the author registers it as such.	3.7%
6. Author rights allow the authors to adopt measures to preserve their authorship of the work—for example, in the promotion and recognition of authorship.	5%
20. Which one of these uses of information is adequate? A) Publishing a document that belongs to another person on a website or blog B) Making a copy of a musical work that is public domain C) Accessing and downloading free content D) Distributing our works with a Creative Commons license E) Creating a website or blog with links to other pages	12%
8. Making a copy of a CD is a reproduction act against author's rights.	18%

The final exam of the course, which was a multiple choice quiz, included questions on the topic of digital ethics. The scores of these exams are high (around 90%). Group 1 included two questions (out of 20) with 94% and 83% of correct answers, respectively. Group 2 included one question (out of 20) about digital ethics with 94% of correct answers.

Conclusions

The educational experiment with Socrative has been an interesting experience that has achieved the expected objectives of the teachers and authors of the current paper, which were: (a) to expose the prior knowledge of student teachers on the topic of digital ethics while removing misconceptions, (b) to motivate learning and (c) to encourage participation. In fact, the answers to the questionnaire resulted in a dynamic participatory class that addressed these aspects in-depth and in response to student teachers' interests and/or their false beliefs.

Thehe ludic/gamified elements in the learning activity seemed useful to student teachers to be willing to verbalize and participate. In the activity, some of the dynamics, components and elements of games were identified (Werback & Hunter, 2012), i.e., progression in the quiz (a dynamic), competition among peers or collaboration in the case of working in pairs, immediate feedback (components) and the existence of a leader board and punctuations (elements).

However, student teachers' perceptions of the educational possibilities of gamified elements were rather low. This is probably related to the fact that they had not experienced this kind of activity during their studies, so they did not know what the educational possibilities related to gamification are or how to design educational experiences that use these strategies in an effective way. Or, perhaps, they considered that these elements cannot be useful in other contexts. Perhaps they consider the technology to not be for academic purposes. Therefore, for future research, it would be interesting to go deeper into the reasons for these scores and see the actual motives, contrasting with successful gamification experiences, like the one explained in Villalustre and del Moral (2015), which show a high level of motivation and satisfaction by the undergraduate students and the development of generic competences.

Despite the limitations related to the coverage of the educational experiment on gamification, this study has shed light on the importance and need of teaching pre-service teachers about aspects related to the use of digital information, as they will be the future teachers (Burguet & Buxarrais, 2013; García-Gutiérrez, 2013). Technology is becoming increasingly more present in every aspect of life, so it is essential that every citizen now and in the future uses digital contents and manages licensing in a proper way, being respectful to others' authorial rights when using contents and conscious of the rights of their own works when creating new content. Of course, this also applies to any educational resource:images, videos, audio, activities, documents and so on that teachers use and/or create. This idea is also one of the trends that were included in the Horizon 2016 report for university teaching (Johnson, Adams Becker, Cummins, Estrada, Freeman & Hall, 2016).

On the other hand, in the current knowledge society,where information is available everywhere, every educational institution needs to find ways to engage students with the course content, arouse interest in them and motivate students' dynamic participation and interaction in the classroom. This educational experiment has shown a successful way to do this based on a small-scale gamification experience focused on higher education. As future work, a large-scale gamification experience could be considered including different courses in the academic year.

Acknowledgments

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Appendix 1

socrative
by MasteryConnect

Qüestionari Aspectes Ètics   Puntuaci
ón:

1. Els drets d'autor sobre una obra reconeixen la propietat intellectual com a dret natural a la persona creadora

(A) True

(B) False

2. Dret d'autor és sinònim a Copyright

(A) True

(B) False

3. Els drets d'autor permeten que el titular de l'obra obtengui compensació econòmica per la utilització de la seva obra per altres persones

(A) True

(B) False

4. Els drets d'autor permeten que sigui sols l'autor qui tengui drets sobre l'explotació de l'obra: reproducció, distribució i comunicació pública

(A) True

(B) False

5. Els drets d'autor permeten que sigui sols l'autor qui tengui drets sobre la reutilització i transformació de l'obra.

(A) True

(B) False

6. Els drets d'autor permeten que l'autor adopti mesures per preservar la seva autoria sobre l'obra, per exemple en la divulgació i reconeixement d'autoria

(A) True

(B) False

7. Escanejar o fotocopiar un text és un acte de reproducció contra els drets d'autor

(A) True

(B) False

8. Fer un còpia d'un CD que hem adquirit és una acte de reproducció contra els drets d'autor

(A) True

(B) False

Page 1 of 4

9. Compartir còpies d'aquest CD és una acte de distribució contra els drets d'autor

(A) True

(B) False

10. Utilitzar un fragment d'un text citant l'autoria és un acte de comunicació contra els drets d'autor

(A) True

(B) False

11. La llei de propietat intelectual contempla que es pugui transformar una obra per millorar-la

(A) True

(B) False

12. Una obra està protegida per drets d'autor quan l'autor la registra com a tal.

(A) True

(B) False

13. Les imatges disponibles a la xarxa a través de google estan lliures de drets d'autor, per tant es poden utilitzar de forma ética.

(A) True

(B) False

14. Indica quines d'aquests obres estan protegides per drets d'autor segons la llei de propietat intelectual

(A) Programes infromàtics

(B) Fotografies, Gràfics, Mapes, Esquemes

(C) LLibres, Conferencies,

(D) Notícies del día, Informaciones de premsa

(E) Música sense lletra, obres teatrals

15. La jnformació que es troba a Internet disponible per descarregar és de Domini Públic. És a dir lliure de drets d'autor.

(A) True

(B) False

16. L'autor pot autoritzar a distribuïr, copiar o reutilitzar l'obra

(A) True

(B) False

17.   Donat un cas en el que hem creat i distribuït un àudiovisual a partir de material de la xarxa (hem descarregat imatges de la xarxa i les hem modificat; descarregat alguns vídeos dels quals hem seleccionat fragments per incorporar al nostre muntantge i hem incorporat una música de fons també descarregada de la xarxa). Hem incumplit els drets d'autor?

(A) True

(B) False

18.   Per descarregar una imatge o document de la xarxa necessitam disposar del vist i plau del autor/a

(A) True

(B) False

19.   Creative Commons permet als autors distribuir les seves obres amb alguns drets sota certes condicions

(A) True

(B) False

20.   Quins d'aquests són usos adequats de la informació

(A) Publicar a la nostra web o blog un document que pertany a una altra persona

(B) Fer una còpia d'una obra musical de domini públic

(C) Accedir i descarregar continguts gratuïts

(D) Distribuir les nostres obres amb llicència creative commons

(E) Crear una web o bloc amb enllaços a altres pàgines

21.   Domini Públic. Es considera que són de domini públic totes aquelles obres disponibles a la xarxa per a la seva descàrrega.

(A) True

(B) False

22.   Les obres passan a ser de Domini Públic després de 70 anys de la mort de l'autor.

(A) True

(B) False

23.   Les obres de música clàssica són de Domini Públic

(A) True

(B) False

24.   La utilització de recursos a l'àmbit educatiu -aula- té un tractament especial i ens permet la reproducció de material sempre que no s'alteri el sentit o forma inicial

(A) True

(B) False

25. Com podem localitzar obres amb llicència per reutilitzar o lliure de drets?

_____

_____

_____

26. Voleu publicar una planificació d'una activitat educativa (e-recurs) i permetre
que altres mestres la facin servir, modifiquin i millorin amb la vostra llicència i deixar
constància. Quins procediments heu de seguir?

_____

_____

_____

27. Com a membre d'una comunitat, per exemple la universitària, teniu accés a
recursos electrònics disponibles per a la investigació, docència i estudi. Aquests
recursos estan suscrits a llicències d'ús per consultar, imprimir i descarregar.

(A) True

(B) False

Figure 2. Template in PDF format of the Socrative quiz (in Catalan).

Conspicuous Internationalization? Creating an International Communication Lounge on a Japanese University Campus

Adam Gyenes

Abstract

Internationalization has become an important strategy for many Japanese universities as they face falling enrollments. While some have successfully attracted students from overseas, others seek different means by which to promote their international appeal, primarily as an attractor of domestic applicants. One way that this is highly visible is in the creation of international communication lounges on campuses: mediated spaces for intercultural exchange and language study that have developed out of the imported model of the self-access center. This ethnographic study looks at the establishment of an International Communication Lounge (ICL) at a private university on the outskirts of Tokyo, where exchange activities, open-access communication classes, and self-study facilities are provided to students in a casual setting. Phillips and Ochs (2003) four stages of policy borrowing in education are utilized as a framework to gain insight into the motivations of various stakeholders in the development of the facility. The ICL is shown to have had a positive impact on interest in international exchange programs and on motivation to study English among the small group of students who make use of the facility. Through this study, a microcosmic view of one university's efforts to internationalize their campus is provided, and there is an impetus for further discussion on the value and implementation of self-access communication spaces on university campuses.

Keywords: internationalization of higher education; Japanese universities; policy borrowing; self-access language learning; study abroad.

Introduction

Internationalization Outside Japan's Elite Universities

Case studies looking at the internationalization of university education in Japan have tended to focus on elite public and private universities, such as those that have received Ministry of Education (MEXT) funding, first through the Global 30 Project (G30) and more recently as Super Global Universities (SGU) (Askew, 2011; Ishikawa, 2009; Ishikura, 2015; Shimizu, 2014; Yonezawa & Shimmi 2015). Yet efforts to internationalize campuses are being made across the range of universities in Japan. Much like the G30/SGU universities, attracting students from overseas has been viewed as an important goal for many other kinds of institutions as well, with the bold target set by the government of 300,000 international students studying in Japan by 2020 (Ministry of Foreign Affairs, 2015).

For elite national and private universities in Japan, the motivation to internationalize comes from a drive to compete with other knowledge-based economies and their universities to bring in the brightest international talents, a process which in turn, is expected to develop homegrown students into *global jinzai* (globally-minded human resources) who can drive Japan's economic competitiveness in the 21st century. Yet outside of this small group of elite schools, for the bulk of private universities in Japan (of which there are almost six hundred), the motivation to bring an international student body onto their campuses is quite different.

Demographic changes in Japan have led to a diminishing pool of 18-year-old prospective applicants and a surplus of university places. As projected by the Ministry of Education, the number of undergraduate places reached equilibrium with the number of Japanese of college age around 2009 (as cited in Kuroki, 1999, p.17). For those not aiming for places at elite schools, university application now involves contemplation of "the relative attractiveness of competing admission offers from a large number of colleges and universities desperate to fill places and generate enough tuition revenue to avoid bankruptcy" (Kinmonth, 2005, p.106). For these at risk schools, attracting students from overseas is commonly viewed as a way to make up the deficit of domestic applicants. Yet in reality, bringing in large numbers of international students is not without prohibitive costs, risks and challenges that prevent this from happening. As a result, many of these institutions focus their attention instead on the visibility of internationalization on their campuses and other conspicuous means by which their international profile can be raised, primarily as an attractor of domestic applicants.

This ethnographic study charts a project undertaken in one such university, to establish an International Communication Lounge, as a hub of student led intercultural exchange and language learning activities at Kita University (both the name of the university and the lounge have been changed for the purposes of this study). The ICL has become an on-campus focal point of internationalization for various stakeholders in the university administration and for students. Yet through the process by which this space was established, a number of questions are raised. What role does a self-access space for language learning and international exchange play in the internationalization of a university campus? To what extent has the ICL come to meet the differing purposes of university administrators and students and what contrasting notions about internationalization does this suggest about each of them? Guided by these questions, this study aims to further discussion on the role of such communication spaces, which are becoming an increasingly common fixture on campuses in Japan, and simultaneously provides a window on the state of internationalization at a university on the periphery of Japan's higher education elites.

Background: Kita University and Japanese University Internationalization

Kita University has two campuses: the original campus, in a rural, prefectural setting approximately 70 kilometers from Tokyo, opened in the 1960s. A second campus was established in the 2000s in a suburb on the edges of the capital. With Japan's demographic changes already a concern for universities at that time, the location of the second campus within the Greater Tokyo area was chosen as a way to gain catchment. Four of university's five faculties were to offer their programs at both campuses, increasing the total number of students from around 2,500, to more than five thousand, 5,343 in 2015 (data from the university's website). Although some degree programs face difficulty, overall the university has successfully maintained enrolment figures, despite the crunch that is hitting universities in Japan.

However, in the same period the university has struggled to attract international students. In fact in 2004, prior to the new campus opening, the university had 794 international students enrolled in their undergraduate programs, making it the fourth largest international undergraduate student body in Japan. Figures published in 2015 show that this figure has fallen by more than half to 326 (see tables 1 and 2). To put this in context, in the same period the overall number of international students studying in Japan has steadily increased by more than 20,000 (Japan Student Services Organization, 2015), yet the university has struggled to maintain the size of its international student body, despite the concurrent doubling of their capacity through the opening of a new campus.

Sources within the university suggest a major reason behind this is increased competition among Japanese universities for international talent. They highlight the fact that it has become easier for students from China and other Asian countries (who have traditionally made up the bulk of the university's international student body, and continue to do so) to access places at more prestigious schools. Students who at one time chose this university because they faced barriers entering other schools, are no longer coming because they now have more avenues available to them.

Table 1 & 2. Ranking of Japanese universities by number of overseas students in undergraduate programs, 2003-4, 2014-15 (Asahi Shimbun, 2004, p.147; 2015, p.162)

Japanese universities by number of overseas students enrolled in undergraduate programs 2003-4		Japanese universities by number of overseas students enrolled in undergraduate programs 2014-15	
1. Ritsumeikan APU	1378	1. Nihon Keizai	3,098
2. Josai Kokusai	1058	2. Ritsumeikan APU	2,286
3. Takushoku	818	3. Waseda	1,828
4. Kita University	794	4. Osaka Sangyo	1,003
5. Osaka Sangyo	744	5. Nihon	951
6. Nihon	716	6. Meiji	827
7. Tokyo Kokusai	700	7. Takushoku	782
8. Jobu	647	8. Ritsumeikan	766
9. Kokushikan	618	9. Meikai	752
10. Jochi	528	10. Tokyo Kokusai	611
11. Meikai	496	11. Josai Kokusai	584
12. Toyo	453	12. Doshinsha	572
13. Ritsumeikan	411	13. Chuo	551
14. Chuo	403	14. Kokushikan	531
15. Kyushu Sangyo	402	15. Kyushu Sangyo	526
16. Ajia	395	16. Kansai Gakuen	464
17. Kinki	395	17. Keio	464
18. Kyushu Kokusai	394	18. Daiichi Kogyo	441
19. Keiai	360	19. Hokuriku	416
20. Asahi	334	20. Toyo	414
		21. Digital Hollywood	404
		22. Ryutsu Kagaku	398
		23. Shisaikan	359
		24. Osaka Keizai Houka	346
		25. Osaka Kokusai	344
		26. Jochi	339
		27. Osaka	336
		28. Shobi Gakuin	332
		29. Kita University	326

A comparison of tables 1 and 2 would seem to support this view. The total increase in the number of international students studying in Japan is clearly seen in the large numbers of international students at the universities that top the 2015 table. As in 2004, all universities in the top twenty for undergraduate students are private universities: the national universities in general are more focused on recruitment of international students at graduate level (Huang, 2015). Prestigious, private G30/SGU universities such as Waseda, Meiji and Keio occupy places in the top twenty of the 2015 list, when in 2004 they had much smaller numbers of international students. Nihon Keizai, which tops the list with more than three thousand international students, has not received G30 or SGU funding, but is one university that has actively sought to distinguish itself as a leader in international student recruitment within the past 10 years. Within this milieu, *Kita* is a university that finds itself with a drastically reduced international student body.

Although there may be other reasons than those cited for the decline, and it may be a different story at other universities, the difficulties faced by many private universities in Japan are highlighted by this case. Attracting students from overseas in order to make up for the falling numbers of domestic applicants is far from straightforward, and while internationalization is generally considered to be synonymous with large increases of international students at Japanese universities (Askew, 2011; Huang 2015), at many schools this is simply not happening. Increased competition for international talent has left some universities without, and they instead seek other, innovative means to promote internationalization on their campuses, as *Kita University* has done through establishing a prominent, on campus space for international communication.

Literature Review

Self-access Centers and Conversation Lounges in Japanese Universities

There has been a steady growth of self-access centers (SACs) at tertiary institutions in Asian countries since the mid 1990s. They first appeared at universities in Hong Kong where they were modeled on innovative centers at Oxford and Cambridge, and strategically introduced with government funding in a top-down fashion (Fouser, 2003). In Japan, the development has come later and mainly in the private university sector. The first SAC at a Japanese university was established at Kanda University of International Studies (KUIS) in June 2001 (Cooker, 2010), which has also become a hub of knowledge about self-access through the Japan Association for Self-Access Learning (JASAL). In the years since, a number of similar facilities have opened at other Japanese Universities. JASAL currently has 32 university centers listed in its registry (JASAL, 2016) yet there are certainly more at other universities that have not registered their center to this list[1].

SACs at tertiary institutions may have roots in language laboratories, libraries, language centers or computer rooms (Fouser, p.49), but they are distinguished from such facilities by their primary aim and benefit of promoting learner autonomy. Thus SACs can be defined by their purpose of inspiring students to take responsibility for their own language development (Hadley & Brown, 2007). They can also simulate immersion in a native-speaker environment by allowing learners to access authentic materials in their language of study, and offer opportunities to communicate with native speakers or near-native speakers (Gardner & Miller, 1999). As a result, they can motivate students by removing potential barriers to learning created by the demands of university curricula, and help them to overcome the language anxiety that

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[1] The author personally knows of four universities with self-access centers that are not listed.

they may experience in more formal classroom settings. Self-access also appeals to institutions because of its flexibility:

> It can be used on a large scale or a small scale. It can be conducted in a classroom, in a dedicated self-access center or elsewhere. It can be incorporated into a language course or it can be used by learners who are not taking courses. It can function at all learning levels … It allows individualization but also supports groups. It is not culture specific. It is not age specific. In effect, self-access learning can benefit all language learners. (Gardner & Miller, p.11).

However, with a recent boom of new facilities in Japan, there is a notable shift in vision when compared with earlier SAC models. Although a priority at earlier centers had been to provide students with a rich variety of resources such as DVDs, graded readers, or test preparation materials, these are notable by their absence at many newer centers, where the aim has rather been to create communication spaces. In fact, early proponents of self-access had tried to shed "a view of self-access which likens it to quiet study or library work" (Gardner & Miller, p.14). In several cases, self-access center administrators sought to involve students in designing the layout of learning spaces; an exercise that gives students a sense of ownership of the space and which can help to overcome the preconception of a quiet study space (Taylor, 2014). Yet while many new centers are created in the image of cafes or lounges to promote an environment of informal or incidental learning, if self-study resources are jettisoned in the process, then there is a danger that students "misconstrue a SAC as more of a social space than a venue for enjoyable language study" (Hadley & Brown, p.28). A question for consideration as the number and range of centers grows in Japan (and one that is pertinent to this study) is whether a conversation lounge can rightfully be called a self-access center and really shares the same aim of promoting learner autonomy.

Development of a Conversation Lounge as Policy Borrowing"

Administrators at Kita University were keenly aware of facilities such as the SAC at KUIS and the growth of communication spaces at other universities in Japan when they decided to import the concept to their campus. Thus the process of establishing the facility can be viewed as a form of policy borrowing, and is framed in this study through Phillips and Ochs model of 'Four Stages of Policy Borrowing in Education' (2003). This model describes the transfer of education policies from one setting to another through four stages of attraction, decision, implementation and internalization/indigenization. These are visualized and elaborated in their cyclical diagram shown in figure 1.
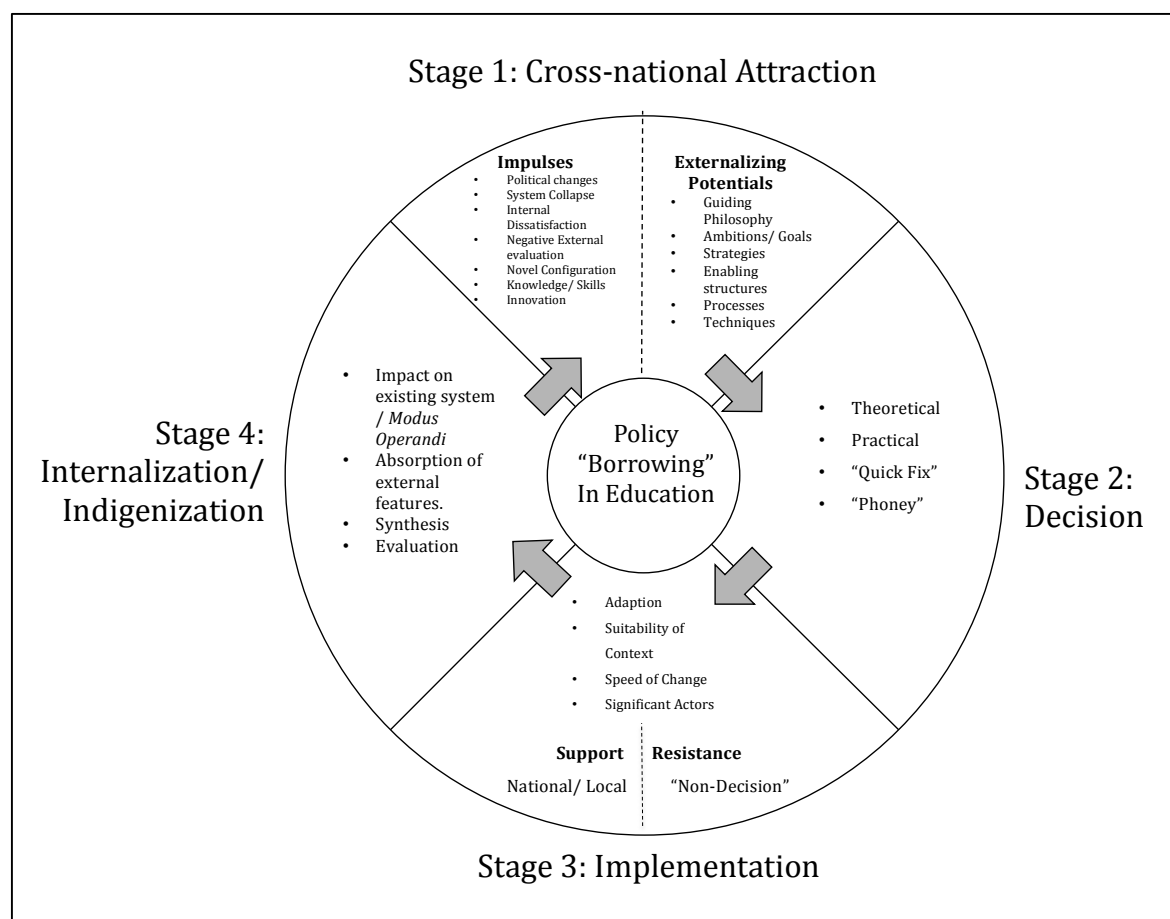
Figure 1. Four stages of Policy Borrowing in Education. (Phillips & Ochs, 2003)

However, this model was developed in the field of comparative education to look at cross-national transfer, and has mostly been applied to the adaption of education systems across borders at the level of national policy. Phillips and Ochs conceived the model out of their own study of transfer between England and Germany (Ochs & Phillips, 2002), and it has been utilized in other comparative transnational studies that looked at borrowing of secondary and higher education reforms at a national level in a number of countries (Chow, 2014; Eta, 2012; Strouzma, 2012). Yet it has also been used at a micro level, for example to study the import of the CEFR (Common European Frame of Reference for Languages) to an English program at a Japanese university (Rappleye, Imoto, & Horiguchi, 2011), and has been suggested as a means of understanding how broad concepts such as learner-centered education transfer across borders (Schweisfurth, 2013).

Although administrators at Kita University were importing a model domestically,from other universities in Japan and not directly from abroad, Phillips and Ochs cross-national transfer model is of relevance in this case. Complexity in the field of internationalization of education often makes it difficult to delineate clear steps in educational transfer in the current age: "a complex sequence of ever-changing processes of regional and trans-regional, national and international systemization and rationalization in education, sometimes replacing, sometimes overlapping one another" (Zymek & Zymek, 2004, p.26). Therefore, a model of educational policy borrowing also needs to be capable of describing the indirect forms of borrowing that take place at a micro level, often between institutions within one country. As in the case of the ICL at Kita University, these importers may not even be aware of the outside origin of the

policy they choose to import, but are nonetheless bringing in foreign concepts as they make efforts to internationalize.

Methodology

As one of the few native English teachers among the university faculty, I was asked to join the project team to establish the International Communication Lounge at Kita University. My direct involvement provided an opportunity to conduct ethnographic research as a participant-observer or participant as observer. Primarily a participant actively engaged in the work of the project, the viewpoint is necessarily subjective. Nevertheless, my status as a relative newcomer at the university and the only non-Japanese member of the project allowed a shift to the positionality of an outside observer in approaching the research questions, with the aim of gathering qualitative data and writing a detailed narrative description of the process.

From the spring of 2014 when initial meetings took place to discuss the possibility of opening the lounge, through to the summer of 2015, when plans had been fully implemented; records were kept of all interactions with others involved in the project during meetings and events held in the facility, as well as many informal discussions and conversations with staff and students. These field notes were then used to map out the establishment process across the first three stages of Phillips and Ochs model: attraction, decision, and implementation.

In order to evaluate the manner in which the fourth "internalization/indigenization" stage of the model had been achieved, semi-structured interviews were conducted in July 2016 with four key members of the project team, and with a focus group of four students who frequently used the ICL. Interviewees were selected as representatives of the different stakeholders within the university who had an interest in the ICL. These interviews help to triangulate the analysis of previously collected observation data, and are referred to in all four parts of the analysis, as the interview subjects were asked to reflect on the establishment process, as well as offer their own evaluation of the role of the ICL and the importance of internationalization within the university. Additionally, as a result of one of the interviews, data about study abroad program participation was made available, and is included in the findings. Details of the interviewees are provided in the table below:

Table 3. Research interview information

Interview	Interviewees	Description
Interview A	ICL administrator	Staff member responsible for day-to-day running of ICL. Responsible for promoting the center among the student body and the main liaison for students who use the center.
Interview B	Admissions office staff	Representative of the university admissions office, involved in initial meetings to establish the ICL.
Interview C	ICL English instructor	Part-time instructor who conducts extracurricular English conversation lessons in the ICL
Interview D	Deputy chief of International exchange Center	Professor who heads the committee of the international exchange center. Assigned to the position one year after the ICL had opened, following the retirement of another professor (referred to as Professor M.).
Interview E	Focus group of four students.	Members of the student group that organizes events in the ICL and frequent participants in extracurricular English classes. All four major in tourism studies, and the group included one freshman, sophomore, junior and senior. They are referred to as "freshman student", "sophomore student" and so on. All four of them had experience of studying abroad.

All interviews were conducted in English, but as all of the interview subjects except interview C were speaking English as a second language, there was some editing for legibility when transcribing the interview data.

Findings

Stage I: Attraction

When Kita University opened a new campus in 2005, the design of the building included a large 'English and Internet café', which students could use for self-study. However, save for providing a few computers and English language newspapers, there was little intervention made to moderate the use of this space, and it received little attention from students for its intended purposes. In spring 2014, three sections of the university came together with the aim of renovating it: the international exchange center, admissions office, and English faculty. It was renamed as the International Communication Lounge and activities that would attract students to use the facility were discussed. Referring back to figure three, the main impulses from Phillips and Ochs's model that motivated each of the three sections can be considered as internal dissatisfaction and negative external evaluation.

The international exchange center's internal dissatisfaction stemmed from low interest in study abroad programs among students. The center has exchange agreements in place with universities in countries including the United States, China, Korea and Portugal. However, few students at Kita took advantage of these opportunities, and in particular, no student had ever been sent to the USA as an exchange student. A handful of students each year participated in

short-term study abroad programs of up to one month. By increasing student interest in study abroad through the ICL, and providing English classes in the space to help students prepare for tests such as TOEFL, they hoped to promote both long and short-term exchange programs:

> Professor M. … He especially wanted some students to go to the USA as an exchange student, but the students … they need to pass the English exam to be an exchange student. So he decided that we will make a place for, how do you say that … students who want to go abroad, so they can study English if they want or whenever they want. (Interview A)

For the admissions office, the impulse was a perceived negative external evaluation, especially in the eyes of potential students and their parents who might visit on open-campus days. Members of the office were aware of similar spaces at other Japanese universities, yet noted that many of those universities they were in direct competition with lacked such facilities. Thus, developing the visual impact of the ICL as a prominent and vibrant part of the campus was a strategy whereby they could distinguish Kita from local competitors and make the campus appeal to prospective students with interest in languages and international exchange:

> I guess for *nyuushi* (admissions) it is for parents of high school students. They really want that their son or daughter will have international skills. Like, not only studying their major, but learning English and some skills to be able to work in an international environment. They really want their children to be that kind of person. Probably for *nyuushi*, it is a good thing to attract those high school students. (Interview A).

> For *nyuushi*, it's a kind of promotion, and we have a tourism department, so it is very attractive for high school students who want to major in tourism. I think it is the most important for us that we could connect it to the department. (Interview B).

My personal involvement was as a representative of English teachers, for whom internal dissatisfaction stemmed from the difficulty of reforming the university's English curriculum. Although the university has no language majors, languages are given importance within the curricula of all departments and English classes are a requirement for all first and second year students in every department. This however, results in large classes of between 40-60 students with varying levels of ability and motivation, as more than a thousand students must be processed through several required English courses each year. Motivating students to be willing to communicate in class under these circumstances can be a challenge, and it can also be difficult for those students who do have ability and an interest to fully benefit from the classes, as students attested to during the focus group interview:

> I sometimes feel those [required] classes are too easy or it is just useful to revise my English … My major is international tourism, but I think it's not enough to touch the international, because almost all students are Japanese and can't speak English well in the class. So I wonder about is it is really international? I think it is not so international.

> (Interview E, freshman student)

> Interviewee: It was difficult for me to ask a question [in required classes]. That is the difference.

> Interviewer: Why do you think it was difficult to ask questions?

> Interviewee: The atmosphere is like… very strict. If I say something then everyone will pay attention to me. (Interview E, sophomore student)

While many English teachers among the faculty are interested in reforming the English programs, institutional constraints make it difficult to enact the large structural changes that would be needed for any significant impact. The ambition therefore, with the ICL was to provide small, student-centered classes that are a supplement and alternative to the compulsory classes in the English curriculum to benefit those students with high motivation who were being let down by the curriculum.

Stage II: Decision

From these initial impulses that were discussed informally in spring 2014, the three sections came together to make plans to renovate the English and Internet café and launch the International Community Lounge from September.

The Four Stages Model suggests four possible reasons that bear on the decision to import a foreign model: theoretical, practical, quick fix, or phoney:

> Is it used to illustrate a theoretical solution to improve the situation at home, or to innovate reform? Is the foreign education policy or practice discussed as a realistic and practical solution, or as a 'quick fix'? Or is it used in the decision-making process as a 'phoney' solution to 'scandalise' or 'glorify' current practices at home? (Ochs and Phillips, 2004, p.10-11)

Given some of the impulses discussed in the previous section, it could be construed that the decision to open the ICL was a quick fix, or phoney decision. Rather than tackling the problems that were the causes of dissatisfaction with the English curriculum, was this just an attempt to paper over cracks? Was the purpose to create an image or façade of internationalization for parents of prospective students, rather than something that would genuinely benefit students?

While the respective incentives of each stakeholder can be interpreted in this way, the most basic reason for the decision was the fact that a space already existed on the campus and was not being used. For this reason, it can be said that ultimately the decision to establish the ICL was made for practical reasons. As noted in the literature review, self-access centers operate on a principle of autonomous learner participation. Therefore, once the decision was made to open the ICL in the autumn semester, the major concern for all stakeholders was how students could be attracted to the space, and motivated to continue to use it:

> Before we had the space called English café there, but actually if we go there we could just see some students eating or sleeping or chatting with their friends in Japanese ... So we really wanted to change this atmosphere when we opened the ICL and we worried how we can get students to go there. (Interview A)

Stage III: Implementation

The ICL was officially opened in September 2014, for the start of the fall semester. The room was divided into two sections: a lounge area with sofas, computers in private booths, a selection of English language magazines and television screens that stream English language content; and a study area with a whiteboard and round tables to accommodate small group classes.

The first semester was something of a trial period in which the aim was to promote the space widely on campus and gauge how many students could be expected to participate in classes and events. From the start of the 2015 academic year, plans would be consolidated.

Three activities were trialed in the first semester. First, a native English instructor was hired part-time to provide English communication classes three evenings a week. These classes were extra-curricular, but were provided for free and were open-access. At first these classes were quite unstructured, as it was difficult to gauge how many students would be interested and whether they would keep attending. There were numerous challenges as the instructor noted:

> I didn't know how many students were going to be there week to week. We had lots of students show up for the initial introduction classes, and then far fewer actually coming to the lessons, and also a real mixture of levels in the classes which made it more difficult to prepare for… there was no real way to prepare for it in the beginning. (Interview C).

Once it was clear that there were enough students to make it viable to run the classes, a curriculum could be developed and these challenges were dealt with:

> We ironed those things out and there is more structure now as well, and that helps students because they know what to expect as well. Now we have split it into three levels so we have a beginner class that is really for beginners… Separating the beginners and the intermediate has encouraged more students to keep coming. Interview C).

Secondly, a committee of student volunteers was formed and initially tasked with arranging themed lunchtime events and parties. Over time, these events have become more ambitious and frequent and include a weekly English lunch, lessons run by students, an annual speech contest and excursions to sightseeing spots in Tokyo where students volunteer to assist tourists. The committee has also gradually taken over the responsibility of recruiting students to the ICL, and taken control of the space, making requests to the university administration about how the space is used:

> They really wanted to have a place to learn by themselves: collecting and eating and learning together like that. So their first request was to use the ICL only for themselves, without other students. A space only for ICL students… Then they said they want to have someone always in the ICL to help for English or learning English, like a staff member. (Interview A).

Thirdly, online conversation lessons were provided on computers in the center. Students could sign up for these and access these lessons via a video conferencing software platform. However, these did not prove to be popular and were phased out from the 2015 academic year.

Referring back to the third stage of the model, the transition from decision to implementation is met with support and resistance. In this case, the establishment of the ICL happened quickly and with little resistance. In a sense, this was possible because the motivations of the three major stakeholders supported each other. Before the ICL was established, without the mutual benefits that were garnered from it, their agendas each faced significant resistance within the university. Reforming the university English curriculum for example, to create smaller, more communicative classes has met with resistance to treating English differently from other university classes, and as a result institutional constraints limit and shape what is possible within university language classes.

However, these barriers do not apply in the context of the ICL, where greater freedom and flexibility are allowed, due to the classes being held outside of the curriculum, and this was made possible because of the agendas of the other two stakeholders. Likewise, the admissions

office and international exchange center were constrained in their ambitions to attract internationally minded students or to promote exchange programs, but were able to further these aims through their mutually supportive agendas.

Stage IV: Internalization/ Indigenization

Criteria for attainment of this fourth stage of Phillips and Ochs model include synthesis, absorption or impact on the existing system. In order to evaluate these impacts, semi-structured interviews were conducted as a follow-up to the initial study, two years after the ICL opened. Two themes that emerged from these interviews were the effect of the ICL on student motivation to study English, and to study abroad.

Motivation to study English

On average between twenty and thirty students a week join the English classes and events in the ICL, and there was some concern that this was not enough, and that more could be done broaden the appeal of the ICL and engage students:

> I hope that more students are interested in the ICL or English or the opportunities, because we prepare opportunities, but the students don't respond very much to our action. I think we can do more. (Interview D).

However, there was recognition that the student committee had a positive impact on maintaining the motivation of the group of students who use the ICL:

> The committee is really important for ICL. Because the students … how do you say that? This is really difficult to keep their motivation for learning English because English is a language and today if I learn ten words, probably tomorrow I will not use these ten words. When they join the group they have an opportunity to use English with their senior or when they go to a volunteer activity. The opportunity is really important. (Interview A).

As well as motivating each other, individual students show the self-motivation to take charge of their own learning that self-access centers aim to promote:

> The biggest stand out student in terms of utilizing my being there would have to be K. He was already one of the best students in terms of ability, on top of that he is very motivated and if no-one else is around when he shows up he is always ready with a list of specific things he wants to talk about like grammar points or vocabulary or some other problem. There is him, and one or two others like that. (Interview C).

However, for the majority of students this is not the case:

> A lot of them are still quite intimidated by learning English. Without a teacher there I don't know how many would be there off of their own backs. (Interview C).

Therefore, while some students show the characteristics of self-motivated, autonomous learners and are attracted to the space, it is questionable whether the ICL as a conversation lounge actually develops these characteristics in students. Perhaps if the space had dedicated full-time staff, or a library of self-study materials as traditional self-access centers do, learner autonomy would be promoted more effectively. Nevertheless, it has become a gathering place for students with an interest in English, and as a social space, it has created an atmosphere in which they motivate one another.

Motivation to study abroad

Data on the number of students studying abroad each year was made available as a result of one of the interviews, and is shown in table 4:

Table 4. Annual student participation in study abroad programs (university's own data used with permission)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Long-term university exchange Programs (up to 1 year)	1	1	2	2	1	3	1	1	1
Independently arranged study abroad (2 to 6 months)	3	4	5	0	2	1	6	7	3
Short-term programs (up to one month)	1	3	4	4	16	9	4	20	17
Total	5	8	11	6	19	13	11	28	21

While participation in long-term exchange programs remains limited to one or two students a year, the table shows a notable rise in the number of students participating in short-term study abroad programs of up to one month since the ICL opened in 2014. However, given that there are only two years showing this increase, those interviewed were hesitant to attribute this rise to the effect of the ICL:

> Many students go and went abroad who are studying in ICL. It means if someone comes to the ICL they are interested to go abroad. But the number of students … although the number of students studying abroad increased in the last two years, I cannot say if it is really because of the ICL. (Interview A).

> We should take into consideration that the number of students studying at this campus increased since 2007, so perhaps we cannot say if the ratio is larger. (Interview D).

Changes in the data over a longer period are needed before a positive effect on the number of students studying abroad can be claimed as a result of the opening of the ICL. However, what can be claimed is that the ICL has given students who are interested in studying abroad a place to meet and gather information from one another:

> After I enrolled in the university I found out about that ICL system. I thought it sounds good, so I tried to go. And I can practice conversation there and develop my English. Also, I was able to share information about how to go abroad or how to improve English skills. There are motivated students in the ICL so they made me more motivated ... I wanted to go abroad but I just didn't know how to go abroad. After I went to ICL I met one older student, and he taught me a lot about how to go abroad, so then I went to the Philippines last year. (Interview E, sophomore student).

Discussion

Utilizing Phillips and Ochs model of four stages of policy borrowing in education as a lens through which to view qualitative data about the establishment of an international communication lounge provided some insights into the broader questions about internationalization that preface this study, and certain conclusions can be drawn about them.

What role does a self-access space for language learning and international exchange play in the internationalization of a university campus?

It can be concluded the main impact of the ICL becoming "internalized" on the campus has been to bring together students with an interest in languages and study abroad, where they motivate each other and exchange information. Indirectly, the agendas of the three major stakeholders have created a cycle of attraction: Students with an interest in languages and foreign cultures are attracted to the university by this prominent international space; they are provided with classes to improve their English communication skills and a social environment that encourages them to communicate, and become interested in studying abroad. This in turn raises the international profile and visibility of internationalization on the campus, which is an attractor of new students.

The visual representation of Phillips and Ochs model (figure 1) also represents policy borrowing as a cycle, in order to illustrate the fact that once a system or program becomes internalized or absorbed, then in turn it becomes a catalyst for new impulses for change. These impulses can be the new knowledge and skills that administrators have gathered from the establishment process, and also new internal dissatisfactions, as they look to broaden the appeal of the ICL and increase student participation in classes and events, or develop the facilities to support autonomous learning more effectively.

To what extent has the ICL come to meet the differing purposes of university administrators and students, and what contrasting notions about internationalization does this suggest about each of them?

Insights relevant to this question emerged from the interview data, as all interviewees were asked why they thought it was important for the university to be more international. Their answers provide insights on their differing viewpoints as stakeholders. For the administrator who works closely with students on a day-to-day basis in the ICL, internationalization of the university gives students a more broad-minded way of thinking, and is linked to cross-cultural understanding:

> This goes for all universities in Japan I think, but after graduating university they really need the way to think about something… I want them to have a skill to think about something not only for the Japanese person, but for everybody. The ICL is really helpful for that kind of thinking. Like, many students are there and many countries students are there and they have an opportunity to talk with them. Many students haven't been to somewhere outside of Japan in our university. Learning other countries language is not only the way to understand what do you say, but also why do you think so. (Interview A).

For the representative of the admissions office the benefits of internationalization are more closely related to the employability of students, who need direct experiences, in order to develop their identity:

> Interviewee: The ultimate goal of university is that finally we have to work … job-hunting. So the activities of ICL should become the advantage for students when they are job-hunting.
>
> Interviewer: So you would like the ICL to support students, for example for TOEIC?
>
> Interviewee: TOEIC is important but it is more important for them to understand other countries' cultures and they can get their Japanese identity as well. In the future we have to work with the other countries so we have to get used to the circumstances or situation. We should challenge them to have more experiences. (Interview B).

For the professor who heads the international exchange center, internationalization is of intrinsic value as a learning experience:

> It is basically a very natural thing to me. It is a basic thing to be open. Globalization means normalization for me. It is very natural … If you see people, you learn. If you see different people you learn more. So as university students or teachers or staff, an opportunity to see a more global world is a learning opportunity, so why not? … If they speak and understand English, they can get more opportunities, they can understand more deeply how the others see the world. So it is just important. It is very natural for me. (Interview D).

While the perspective and emphasis of each stakeholder is slightly different, there is a common theme running through the three quotations and they are all essentially saying something very similar: All of them view internationalization as an asset to students in the future, not simply in terms of gaining language skills or higher test scores, but through experiences that broaden their perspective and give them a stronger understanding of their identity in the world.

Conclusion

The question in the title of this paper, "conspicuous internationalization?" was the spark for undertaking this research, and essentially it is a question of whether this communication lounge was developed to internationalize the university campus or just to give the appearance of internationalization: a kind of *tatemae* internationalization to appropriate a Japanese term for contrasting a person's true feelings with displayed behavior. A narrative was constructed through Phillips and Ochs model of education policy borrowing, which gave insights into the impulses, decision-making, implementation and internalization of the ICL. While some of the impulses for this may have been superficial: to create a highly visible international space on the campus; the ICL has developed into a hub for students who are attracted by internationalization, where they can improve their language skills, gather information about studying abroad, and motivate one other.

This narrative is limited by the subjectivity inherent in a participant observer approach, yet it is an approach that has generated a rich, qualitative description of the process, which would be useful to other university administrators in Japan or elsewhere interested in developing similar spaces. Although it has been possible to map out the complete cycle of the establishment process in the two-year period covered by this study, the conclusions are somewhat tentative, and potential areas for future research would be to look at the longer-term effect that this space has on study abroad rates or actions that are taken by administrators to promote autonomous learning. Furthermore, as demographic changes in Japan start to affect universities in Japan more severely, the strategies and stances that are taken towards internationalization will be an interesting area for future research.

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**An Analysis of Creative Process Learning in Computer Game
Activities Through Player Experiences**

Wilawan Inchamnan

Abstract

This research investigates the extent to which creative processes can be fostered through computer gaming. It focuses on creative components in games that have been specifically designed for educational purposes: Digital Game Based Learning (DGBL). A behavior analysis for measuring the creative potential of computer game activities and learning outcomes is described. Creative components were measured by examining task motivation and domain-relevant and creativity-relevant skill factors. The research approach applied heuristic checklists in the field of gameplay to analyze the stage of player activities involved in the performance of the task and to examine player experiences with the Player Experience of Need Satisfaction (PENS) survey. Player experiences were influenced by competency, autonomy, intuitive controls, relatedness and presence. This study examines the impact of these activities on the player experience for evaluating learning outcomes through school records. The study is designed to better understand the creative potential of people who are engaged in learning knowledge and skills during the course while playing video games. The findings show the creative potential that occurred to yield levels of creative performance within game play activities to support learning. The anticipated outcome is knowledge on how video games foster creative thinking as an overview of the Creative Potential of Learning Model (CPLN). CPLN clearly describes the interrelationships between principles of learning and creative potential, the interpretation of the results is indispensable.

Keywords: creative potential; learning model; digital game based learning; player experience; game; creative component.

Introduction

A digital game involves role-play characters, complex problems to solve, and compelling music and graphics (Shute, 2011), with knowledge and skills being learned during the course of playing. Games, in general, support the development of critical thinking through visualization, experimentation, and creativity (Amory, 2007). Game elements often provide problem solving experiences as players try to break down the tasks, engage meta-cognitive skills, and think critically (Turcsányi-Szabó, Bedő, & Pluhár, 2006). Games also offer an opportunity to explore new ideas and actions through the diversity of game play opportunities generated by communities of players. While there has been significant growth in game-based learning research in the past two decades (Habgood and Ainsworth, 2011), this research focuses on the games that have been specifically designed for educational purposes and facilitate problem-solving skills. This study investigates how video games foster creative problem solving and learning processes.

Creative Potential

To identify the potential of games to engage the players in creative processes, criteria related to the activities undertaken need to be clearly defined. As mentioned in the works of Paras and Bizzocchi (2005), games have great potential to support creative processes (Paras and Bizzocchi, 2005). Furthermore, creative ideas resulted from the novel combination of ideas (Spearman, 1930). This creativity involves a process of divergent and convergent thinking (Amabile, 1996), in which problem solving plays an important role (Clark, Veldman, & Thorpe, 1965).

Divergent and convergent thinking are the core elements of the creative process. Divergent thinking is important for idea generation (Amabile, 1996) and is necessary to produce many alternative solutions to the problem (Gordon, 1961). Convergent thinking, as a creative process, occurs in the idea validation stage (Amabile, 1996). It allows an individual to select the correct way to approach the task at hand (Sviderskaya, 2011), with the ability to select a single response from a series of alternatives (Clark et al., 1965). To develop interactive experiences that incorporate these valuable and educative learning processes, a clear understanding of how different game elements are combined to produce the creative potential is needed.

Game Activity Components for Creative Gameplay

The creative game potential measures can be identified by analyzing game activities. The game play activities and the creative process components can facilitate creative processes, and the game activities related to the creative potential during game play. Thus, these activities are able to support the learning of individuals (Inchamnan and Wyeth, 2013). Playing games has a significant role in learning to solve problems (Myers, Well, & Lorch, 2010). Game activities have influences on creative potential through creative gameplay. For example, game activity facilitates creative-relevant skills and provides greater opportunities for players to take a wide focus when engaging in gameplay with open-ended goals. The feedback activities provide positive reinforcement, which enhances free-choice and self-awareness (Inchamnan and Wyeth, 2013).

Self-Motivation Reports

The game environment is the medium that allows players to achieve self-motivation. Games significantly extend the range of experiences available to an individual. Enjoyable game

experiences result from players being able to work through the game interface to become immersed in playful activity. Within this study, measurement of player experience is based on self-determination theory (SDT) (Ryan, 2000). SDT has been successfully applied in many study discipline such as sports, education, and leisure domains. Przybylski, Rigby and Ryan (2010) applied SDT to video game player motivation. Based on SDT and other relevant theories (e.g., presence), Przybylski (2010) and his colleagues developed the Player Experience of Need Satisfaction (PENS) measure, which assesses the game play experiences in terms of competence, autonomy, relatedness, intuitive controls, and presence/immersion (Przybylski et al., 2010). The PENS measure the individual player experience by assessing the interface between the player and the action taking place within the game environment and how the action and reaction between player and game satisfies specific psychological needs (Rigby and Ryan, 2011).

In this study, to assess game play experiences, the 21-item PENS survey was adopted. It evaluates game play experience from five dimensions: competency, autonomy, relatedness, presence, and intuitive controls. Each item consists of a statement on a seven-point scale, ranging from 1 to 7. The interactive experience with the game environment allows players to express their creativity and intentions (Sweetser and Johnson, 2004). This learning experience allows players greater freedom in terms of decision-making.

Game Based Learning

There are many new approaches towards education, teaching and learning. Young people are challenged and engaged to identify rewarding learning experiences that will inspire them in the 21st Century (Perrotta, Featherstone, Aston, & Houghton, 2013). The use of video games in education is focused on the emergence of new trends like Game-based learning that support teaching and learning. Game-based learning refers to the use of video games to support teaching and learning (Perrotta et al., 2013). Game environments influence learners to foster their skills, are an essential part of child development today (Prensky, 2005a). and provide fun and engagement (Prensky, 2002).

Games for Learning

Learning experiences allow players greater freedom in terms of decision-making. Games offer an opportunity to explore new creative uses through the diverse ideas generated by communities of players. Learners gain meta-cognitive skills and group identity that could influence experiences for life through motivating game play (Turcsányi-Szabó et al., 2006). Games keep learners motivated (Prensky, 2005b). The main reason that people play games is because the process of game playing is engaging.

Table 1. Principals and Mechanics of Learning (Perrotta et al., 2013)

Principals	Mechanics
– Intrinsic Motivation – Enjoyment and fun – Authenticity – Autonomy – Experiential Learning by doing	– Rules: simple and binary – Clear and challenging goals – Fantasy and difficulty – Self-control and feedback – Social element

Table 1 shows the principals of learning based on game activity. The principles refer to the underlying assumptions and concepts. Mechanics refers to processes and dynamics involved in game-based learning, which are interdependent (Paras and Bizzocchi, 2005). The principals and mechanics involved in game-based learning are studied based on the extent that video games can impact overall academic achievement. The majority of the studies examine the impact of video games on student motivation and their school record: programming, math and art subject areas. Video games allow learners to engage with topics and ideas through interaction and simulation, rather than through the conventional materials and formats of schooling: textbooks, lessons, assignments and so forth (Perrotta et al., 2013). To understand to what extent gaming impacts learning outcomes, this study examined the relationships between participants' self-reports and academic learning outcomes.

Behavior Analysis

Behavior is the activity of living organisms including how they move, what they say, what they think, or how they feel. The experimental analysis of behavior has uncovered a number of basic principles about how behavior works as a function of environmental variables (Cooper et al., 2007). Behavioral assessment involves a variety of methods including direct observations, interviews, checklists, and tests (Cooper et al., 2007). Direct measurement is concerned with measurement of the specific behavior to be taught. For example, direct measurement must provide data on student response to the actual materials used in the instructional setting (Cooper, 1982). Applied behavioral analysis is concerned with the manipulation of environmental stimuli (Cooper, 1982). Games create environments where each challenge stands alone and is addressed that way by a player. This study focuses on the game environments that foster creative processes by using behavior analysis. Behavioral assessment allows analysis of creativity from a divergent thinking and convergent thinking perspective. Measurement of divergent and convergent thinking can be used in the identification and development of creative potential (Schaefer, 1969).

Factor Analysis

Factor analysis is one of the most commonly used procedures in the development and evaluation of psychological measures (Floyd and Widaman, 1995). The factor analysis method is used to divide criteria into groups (Tzeng et al., 2007). Factor analysis is particularly useful with multi-item inventories designed to measure behavioral styles, cognitive schema, and other multifaceted constructs of interest to clinical psychologists (Floyd and Widaman, 1995). Assessing creative potential requires a focus on how and why an individual responds to activities (Kaufman et al., 2011). The behaviors that are related to the creative activity must be clearly stated and readily translated into the assessment (Amabile, 1983).

This study used three main factors. The first factor comes from the model proposed by Ruscio, Whitney, and Amabile (1998), to identify task motivation as a measure of involvement in tasks. Behaviors such as set breaking, task pace, exploration, enjoyment, and concentration are identified as the ways in which intrinsic motivation manifests itself within the creative process. Second, domain-relevant factors determine the initial set of pathways to search for a solution and the ability to verify an acceptable solution (Amabile, 1983) through assuredness, difficulty and exhibited uncertainty activities within gameplay. Third, the ability to break away from standard thinking, approaches and solutions during problem solving. Individuals can gain experiences from idea generation that may inform their own strategies (Amabile, 1996). Creativity-relevant skills are measured through the specific process factors of concrete focus, concept identification, wide focus and striving (Ruscio et al., 1998).

Methodology

The study methodology was broadly divided into two stages. The first stage involved a game study adapted from an existing creative potential method (Inchamnan et al., 2012). This creative potential method examines players by using established creativity criteria in order to determine the levels of creative activity. The process focused on the reliability of the factors used for measurement determining those factors that are more strongly related to creativity. The second stage involved the determination of relationships of game play elements. The objective of this stage was to investigate and establish related elements that supported creative performance and learning outcome.

To examine the creative process, participants were video recorded while playing the games and a video coding scheme was used to capture the type and frequency of observable behaviors and participant verbalizations. To assess the game experiences, this study used the 21-item PENS survey that consists of five dimensions: competency, autonomy, relatedness, presence, and intuitive controls. Each item consisted of statements on a seven-point scale ranging from 1 to 7. Specifically, the research reported in this paper examined the relationship between creative game play processes and game play experience as measured by the Player Experience of Need Satisfaction (PENS) survey: in-game competence; in-game autonomy; in-game Presence; in-game intuitive control and in-game relatedness. This paper examines the relationship between creative game play processes and game play mptivation experience as measured by the Player Experience of Need Satisfaction (PENS) survey:

- In game Competence. This scale measures participants' perception that the game provides a competency.

- In game Autonomy. This scale assesses the degree to which participants felt free, and perceived opportunities to do activities that are interested in them.

- In game Presence. This scale measures the sense of immersion in the gaming environment. Three items considered are: physical presence, emotional presence and narrative presence.

- In game Intuitive Control (IC). This scale assesses the degree which participants control their character's actions in the game environment.

- In game relatedness. This scale assesses the desire to connect with others in a way that they feel authentic and supportive.

Study Procedure

To explore the relationships between the uses of creative processes during game play and the player experiences, this study focused on four games, that is, Portal 2, I-Fluid, Gunz 2: The second Duel, and Braid. While these games had different mechanics, goals and settings, they all required the players to solve problems in the game tasks to progress through the game play. Evaluation methods involved examining the creative process as measured by task motivation, domain-relevant skills and creativity-relevant skills. Game task behaviors and verbalizations were coded to obtain the empirical indices of the creative processes in which game players were engaged. Participants (N=120) were observed during play of the four selected games. To examine the creative process, participants were video recorded while playing the games. A video coding scheme was used to capture the type and the frequency of the observable behaviors and verbalizations. This coding scheme was implemented based on the criteria below that were developed for analyzing creative process (Inchamnan, Wyeth, & Johnson, 2012). The results from stage 1 were used to establish the extent to which the games facilitated creativity and how the components of creativity were involved. A video coding scheme was used to capture the type and the frequency of the observable behaviors and verbalizations in which participants engaged. The coding used items that were identified as significant in the creative process (Ruscio et al., 1998). The coding was performed using both 7-point Likert scales and frequency counts.

In terms of learning, the pilot study included 15 students. The unit outcomes of participants during the study period were observed in order to evaluate logical skills (math and programming) and creative art skills (i.e., animation drawing). The study examined the impact of video games on the students' motivation and their school records: programming, math and art subjects. The participant group played the game Gun Z 2: The second, Duel online between their friends and Bots. In the experiments, gameplay finished in approximately 15 minutes in total and completed a Player Experience Needs Satisfaction (PENS) questionnaire (Przybylski et al., 2012) after playing.

Results

Factor Analysis of Creative Potential Game Activities

The levels of creative problem solving that occured during game play and the determination of the game design elements were necessary in facilitating creative game play. Objects and resource manipulation within the games were a source of behavior variation across all components. Table 2 shows the actual factors that were extracted from all 16 variables. In table 2, all factors account for 72.51 percent of the variability in all 16 variables.

The pilot testing of items performed to ensure a common construct are moderately correlated with one another and are correlated with the total scale score. If one item does not satisfy the moderate correlation constraint (e.g., $r \geq .20$) to other items in the construction process, that item tends to perform poorly in a factor analysis. Kaiser-Meyer > .5 (.789, n=120) is acceptable for this factor analysis technique.

Table 2. Behavioral Factor Total Variance Explained

Factor	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.231	38.947	38.947
2	2.470	15.439	54.386
3	1.618	10.110	64.495
4	1.282	8.012	72.508

Strong Factor Component

According to table 2, Factor 1 accounts for 38.95% of the variance value of all 16 variables. Ten variables that are loaded strongly on this factor are involvement (task), set breaking (task), pace (task), planning (task), playfulness (task), exploration (task), enjoyment (task), concentration (task), assuredness (domain), difficulty (domain) and wide focus (creative).

Table 3. Components Matrix of Creative Components

Component Matrix[a]				
	Factor			
Creative Component	1	2	3	4
Involvement (Task)	.753	-.257		-.131
Stability (Task)	.232	.705	.314	
Set breaking (Task)	.863			
Pace (Task)	.787	-.246		
Planning (Task)	.888	.149		.127
Playfulness (Task)	.830	.361	-.111	
Exploration (Task)	.843	.317		.111
Enjoyment (Task)	.804	.384		
Concentration (Task)	.790		.118	
Exhibited uncertainty (Domain)		.605	.569	
Assuredness (Domain)	.748	-.506		.185
Difficulty (Domain)	.298	-.461	.574	-.157
Wide focus (Creative)	.329		-.556	-.321
Striving (Creative)	-.257	.834		-.215
Concrete focusses (Creative)		.131	-.328	.860
Concept identification (Creative)	.248	.295	-.515	-.328

This issue regarding measured variables concerns the scale on which scores fall. Factor 1 finding refers to the player who can work on solving problems (involvement game activity). The game play gives players the opportunity to manipulate materials; uses or attaches them in new combinations (set breaking game activity). Speed while playing the game allows the participant to work on tasks/challenges (pace game activity), allows players to organize material, to establish an idea, and to order to build on (planning game activity). Playfulness (playfulness game activity) activities engage the player in tasks in a curious manner; trying out ideas in a carefree way and exploration (exploration game activity), being curious, or playful,

while testing out new ideas. The enjoyment (enjoyment game activity) refers to the fact that the player has a pleasant experience, finds pleasure in the task/challenge and focuses on the task; not distracted (concentration game activity).

The task motivation game activities relate to the learning domain-relevant skills during game play. The results in the domain-relevant skills categories might be expected. Players are confident: certainty of ability to complete tasks; assuredness in going about the task; not doubtful, timid, or anxious (assuredness game activity). The player faces the problems within the game activities and reflects on the game tasks by making a negative statement (difficulty game activity). The creative-relevant skill has a relationship between the effect of intrinsic motivation and domain-relevant skill required during game play activities. The creative-relevant skill allows the player to have a future oriented; restatement of the problem given, the self-imposed goal, and statement dealing with a desired final goal (wide focus).

Player Experiences Have an Influence on Creative Process Skills

The significant mean differences of PENS scores (player experience) across creative components shown in Table 4 point out that players felt competence during involvement in the game. The autonomy scale assesses the degree to which participants felt free, and perceived opportunities to do activities that interest them with striving. In game relatedness, the scale assesses the desire to connect with the others in a way that feels authentic and supportive.

These results show significant ($\alpha < .05$) player experiences that are significant to the concept identification within the game play. The intuitive control scale aims to assess the degree to which participants control their character's actions in the game environment. These results show significant ($\alpha < .05$) player experiences that were significant to the concept identification and striving within the game play activities. These findings show that player experiences have an influence on creative process skills.

Table 4. The significant mean differences of PENS scores across creative components

ANOVA Between Group	Df.	F	Sig.
Involvement and Competence	9	7.698	.018
Striving and Autonomy	9	5.301	.040
Concept identification and Relatedness	7	5.003	.025
Striving and Intuitive Control	10	6.587	.042
Concept identification and Intuitive Control	10	6.305	.045

Game Activities Encourage Efficient Learning

The significant mean differences of school record scores across creative components shown in Table 7 point out that players adjusted speed at particular tasks, in a slow to a fast gradient of task rate. The logical skills as programming subjects related how students organize game elements; establishes an idea, order to build in, and steps to take within game activities.

Table 5. The significant mean differences of school record and creative components

ANOVA Between Group	Df.	F	Sig.
Programming and Pace	5	4.104	.032
Programming and Planning	4	5.649	.012
Art and Concept Identification	8	4.406	.044

These results show significance (α < .05) in the relationships between the Art subject and creative-relevant skill as concept identification within the game play activities. These findings show that game activities encourage learning in this domain.

Game Activities Facilitate the Creative Process During the Game Play Experience

The finding identifies (in Table 6) a significant (α < .05) player experience of playing games that were coded with involvement (task motivation), exhibited uncertainly (domain-relevant skill) and concept identification (creative-relevant skill) within the game play. The programming and mathematics results aim to assess the degree that a player has logical thinking about learning. These results show a significant (α < .05) playful learning that was signed with exploration, wide focus, and concept identification within the game play.

Table 6. The significant mean differences of PENS scores across creative components

ANOVA Between Group	Df.	F	Sig.
Involvement and Year of Game Experience	3	8.103	.004
Exploration and Programming	5	7.784	.004
Exhibited uncertainly and Year of Game Experience	3	5.721	.013
Concept identification and Year of Game Experience	3	14.707	.000
Wide focus and Math	4	6.424	.008
Concept identification and Programming	5	9.068	.003

Creative Potential and Learning Outcome

The creative-relevant skill encourages learning activity through the degree to which player has logical thinking of learning (involvement, concept identification and year of game experience). It appears that the ideal conditions for creativity are achieved within self-initiated backtracks by using intentional moves to previous locations or by revisiting a particular game task/challenge (exhibited uncertainly and year of game experience).

Table 7. The significant mean differences of PENS scores across creative components

ANOVA Between Group	Df.	F	Sig.
GPA and Competence	9	8.361	.015
GPA and Intuitive Control	10	5.977	.050

Table 7 shows a significant difference of learning outcome (GPA) within the players' feeling of competence and intuitive control during play games. These findings refer to game activities that can facilitate an individual's learning outcomes by using creative process skills.

Guidelines for Digital Game Based Learning

As aforementioned, the guidelines presented herein are used to assist game developers to produce games that facilitate creative problem solving. First, learning outcomes have to be mapped to the mechanisms of learning that are identified as facilitating creative potential. These conceptual guidelines are shown in figure 1 as an overview of the Creative Potential of Learning Model (CPLN). In the figure, one can see that all principle concepts are linked into the circular module. In order to clearly understand the interrelationships between principles of learning and creative potential, the interpretation of the results is indispensable. A game's ability to facilitate task motivation centers on the creation of an environment that instills confidence to complete tasks and ensures that players have logic skills to explore their experiences.
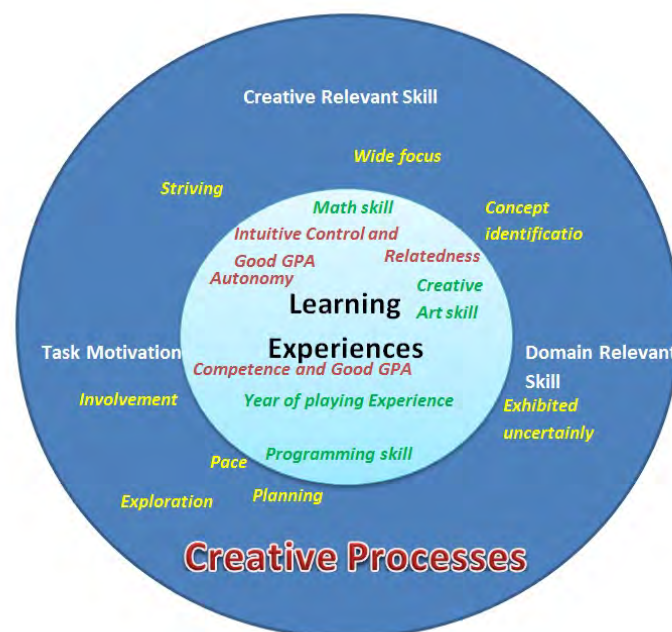
Figure 1. The Creative Potential of Learning Principles Model (CPLN)

Creativity-relevant skills provide greater opportunities for players to strive to engage in gameplay. This can be achieved by allowing activities such as Striving and Autonomy and Striving and Intuitive Control. The results refer to game activity experiences as intuitive control affects the learning outcome.

This can also be achieved by allowing activities that are future-oriented, to let players work through problems which require facilitating interactions with others, and require a feeling of intuitive control (concept identification and relatedness; concept identification and intuitive control). Creative-relevant skills encourage learning activities related to logic, such as concept identification and creative art skill, wide focus and math, and concept identification and programming.

The tension parameter has been identified between providing an experience that encourages striving (creative-relevant skills) and producing gameplay where the player finds it straight-forward to understand what they are required to do and how they might go about doing it (domain-relevant skills). In identifying processes, it appears that the ideal conditions for creativity are achieved within self-initiated backtracks by using intentional moves to previous locations or revisits of a particular game task/challenge (exhibited uncertainly and year of game experience).

Task motivation activities results showed that game challenges effectively allowed for cognitive and logical thinking and strategic planning. There were multiple types of challenges available that players could approach in their own way and at players' own pace. The level of challenge was well matched to player skill level.

The subsequent step of the producing a guideline is to map the game activity components to the mechanisms identified (Inchamnan et al., 2014), and learning skills in Figure 1. These guidelines are outlined below. Please notice that creative components which are facilitated are included in brackets.

- Ensure that the class includes clear goals that allow students to develop their own sub-goals and problem solving skills (wide focus, math skill).
- Create challenges in the class that require logical thinking, involvement and strategic planning in the class (complexity in problem solving, planning, refining problem solutions)
- Implement challenges that develop at an appropriate pace and match a student's skill level (facilitate striving activity, environments that instill feeling autonomy)
- Implement rules that offer freedom of choices, where students have the options about what actions to use to solve a problem in the class lesson (wide focus, object use and manipulation, planning)
- Manage student errors by allowing supports for the recovery from errors, and by ensuring that the impact is minimal (facilitate striving activity, environments that instill confidence)
- Allow students to receive immediate and continuous feedback on their actions (environments that instill competence, understand what is required, clear pathways to complete lesson)

Conclusion

This study examines the aspects of game playing that might help people learn more effectively. The study maps the results of the analysis of players engaging in creative problem solving during online game play. Data analysis helps us to better understand how in-game activities influence a player's engagement in creative activity and learning. Furthermore, this study developed preliminary guidelines. The guidelines consider the specific ways that game developers might align learning mechanisms to support creative problem solving processes.

The activities should provide involvement, exploration and planning. Players should be engaging problem solving skills, concept identification and wide focus. They should be striving, and exhibiting uncertainty.

Future studies should investigate the applicability of the Creative Potential of Learning Model to other game genres. Furthermore, the guidelines proposed in this study could be applied and evaluated in game development to support creative activity for educational purposes. Finally, future works could focus on larger samples in order to find out how games have the potential to help people to learn more effectively in terms of creative processes.

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Appendix 1. Example of School Record

Subject	Cr./Grade/Point	Subject	Cr./Grade/Point
General Education 30 Credits		GT203 Drawing for Animation & Game Develop	3/A /12.0
Humanities 6 Credits		GT204 Computer Programming Concepts	3/C+/7.5
Humanities Mandatory 3 Credits		GT205 Game Concepts and Design	3/A /12.0
GE120 Physical Education for Quality of Life	1/A /4.0	GT206 Mythology and Game Development	3/A /12.0
GE139 Holistic Approaches to Life	1/A /4.0	GT207 Laws & Ethical Issues in Game Dev. Prof.	3/A /12.0
IL103 Information for Research	1/A /4.0	GT208 Business Model Writing for Interactive an	3/B+/10.5
Humanities Selective 3 Credits		LA201 English for Specific Purposes 1	3/D+/4.5
GE121 Man and Reasoning	3/__/____	LA202 English for Specific Purposes 2	3/D+/4.5
GE122 Philosophy and Life	3/A /12.0	Major Courses 45 Credits	
GE123 Thai Studies	3/__/____	FA209 Drawing 2	3/B /9.0
GE124 Thai Folk Wisdom	3/__/____	GD303 Introduction to Graphic Design	3/B /9.0
GE131 World Civilization	3/__/____	GD304 Typography 1	3/B+/10.5
Social Sciences 9 Credits		GT301 Digital Storyboard	3/B /9.0
Social Sciences Mandatory 6 Credits		GT302 Computer Graphic and Animation	3/A /12.0
BA102 Business Analysis and Planning	3/C+/7.5	GT303 Digital Character Modeling	3/A /12.0
LW102 Introduction to the Study of Laws	3/C /6.0	GT304 Game Interface Design	3/A /12.0
Social Sciences Selective 3 Credits		GT305 Digital Objects and Tools Design	3/A /12.0
BA101 Managing Business for New Entrepreneur	3/__/____	GT306 Environment and Level Design	3/B+/10.5
GE125 Politics, Economy, and Society	3/__/____	GT307 Digital Audio & Video for Game Product	3/B+/10.5
GE126 Psychology for Quality of Life	3/B+/10.5	GT308 Project Management for Game Productio	3/A /12.0
GE137 Public Mind for Community	3/__/____	GT309 Game Engine	3/A /12.0
Sciences and Mathematics 6 Credits		GT310 Game Design Criticism and Analysis	3/A /12.0
MA103 Mathematics and Statistic for Daily Life	3/C /6.0	GT311 Game Development Project 1	3/B+/10.5
SC103 Science and Technology for Quality of Life a	3/B /9.0	GT312 Game Development Project 2	3/A /12.0
Languages 9 Credits		Elective Courses 15 Credits	
LA010 Remedial English	-/S /0.0	AD301 Advertising and Consumer Behavior	3/__/____
LA101 English 1	3/D+/4.5	BT321 Digital Imaging	3/__/____
LA102 English 2	3/C /6.0	BT322 Digital Photography	3/__/____
TH103 Communication Skill in Thai	3/C+/7.5	BT323 Multimedia Business	3/__/____
Core Courses 42 Credits		BT345 Graphic Design for Web Site	3/B+/10.5
FA201 Art Aesthetic	3/B+/10.5	BT401 Directed Study	3/__/____
FA205 Thai Art	3/B /9.0	BT402 Special Topic in Multimedia System	3/__/____
FA207 Art Composition	3/A /12.0	GT351 Digital Lighting and Camera Technique	3/A /12.0
FA208 Drawing 1	3/B+/10.5	GT352 Texture Rendering Technique	3/A /12.0
GT201 Intro.to Interactive Design & Game Develo	3/B /9.0	GT353 Interactive Web Site Design	3/C /6.0
GT202 Mathematics for Game Developers	3/C /6.0	GT354 Protfolio Development	3/__/____

Subject	Cr./Grade/Point	Subject	Cr./Grade/Point
GT355 C Programming	3/__/____		
GT356 C ++ Programming	3/__/____		
GT357 2D Game Programming	3/__/____		
GT358 3D Game Programming	3/__/____		
GT410 Co-operative Education	6/A /24.0		
IT207 Electronic Business	3/A /12.0		
MK201 Principles of Marketing	3/__/____		
วิชาหมวดเลือกเสรี			
	0/__/____		

Present :	Total Credits	:	138 Credits.	Cumulative Points :	454.50 Points
	Credits Earned	:	138 Credits.	Grade Point Average :	3.29 Points

Appendix 2. The Pens Questionnaire

ID_____

PENS	1= Do Not Agree(ไม่เห็นด้วย), 7=Strongly Agree(เห็นด้วย) 1 2 3 4 5 6 7
PENS: Competence C1. I feel competent at the game. ผู้เล่นรู้สึกเชื่อมั่นว่าสามารถเล่นเกมได้	
C2. I feel very capable and effective when playing. ผู้เล่นรู้สึกว่าสามารถเล่นเกมได้ดีและมีประสิทธิภาพ	
C3. My ability to play the game is well matched with the game's challenges ความสามารถของผู้เล่นเหมาะสมกับด่านต่างๆในเกม	
PENS: Autonomy A1. The game provides me with interesting options and choices ในเกมเตรียมทางเลือกต่างๆ ให้ผู้เล่นอย่างน่าสนใจ	
A2. The game lets you do interesting things เกมให้ผู้เล่นรู้สึกสนใจที่จะเล่นเกม	
A3. I experienced a lot of freedom in the game ประสบการณ์ในเกมรู้สึกผู้เล่นมีอิสระในการเล่น	
PENS: Relatedness R1. I find the relationships I form in this game fulfilling. ผู้เล่นรู้สึกมีความสัมพันธ์กับเกมและเติมเต็มผู้เล่น	
R2. I find the relationships I form in this game important. ผู้เล่นรู้สึกมีความสัมพันธ์กับเกมมีความสำคัญ	
R3. I don't feel close to other players. (-) ผู้เล่นรู้สึกไม่รู้สึกใกล้ชิดกับผู้เล่นคนอื่น	
Presence/Immersion P1. When playing the game, I feel transported to another time and place. ขณะเล่นเกมผู้เล่นรู้สึกปิติยินดีในช่วงเวลาและสถานที่นั้นๆในเกม	

P2. Exploring the game world feels like taking an actual trip to a new place. การท่องและค้นหาในเกมผู้เล่นรู้สึกเหมือนได้ไปในสถานที่ใหม่ๆ						
P3. When moving through the game world, I feel as if I am actually there. ในขณะที่ผู้เล่นท่องไปในโลกของเกมผู้เล่นรู้สึกเหมือนอยู่ ณ ที่นั้นๆ จริงๆ						
P4. I am not impacted emotionally by events in the game (-). เหตุการณ์ในเกมไม่มีผลกระทบต่อจิตใจของผู้เล่น						
P5. The game was emotionally engaging. เกมโน้มน้าวใจผู้เล่น						
P6. I experience feelings as deeply in the game as I have in real life. ผู้เล่นรู้สึกว่าเกมเหมือนในชีวิตอย่างมาก						
P7. When playing the game I feel as if I was part of the story. ผู้เล่นรู้สึกว่าเป็นส่วนหนึ่งของเนื้อเรื่องในเกม						
P8. When I accomplished something in the game I experienced genuine pride. ประสบการณ์ในการเล่นเกมทำให้ผู้เล่นมีความภาคภูมิใจที่สามารถเล่นและแก้ปัญหาภายในเกมได้						
P9. I had reactions to events and characters in the game as if they were real. ผู้เล่นตอบสนองเหตุการณ์และตัวละครภายในเกมเหมือนในชีวิตจริง						
PENS: Intuitive Controls: I1. Learning the game controls was easy. สามารถเรียนรู้การควบคุมเกมได้ง่าย						
I2. The game controls are intuitive. การจัดการในเกมสร้างความคิดริเริ่มให้กับผู้เล่น						
I3. When I wanted to do something in the game, it was easy to remember the corresponding control. เมื่อผู้เล่นต้องการจะทำอะไรบ้างอย่างในเกมสามารถทำได้สะดวกเนื่องจากอุปกรณ์ควบคุมในเกมสอดคล้องกัน						

Appendix 3. Observations Checklist

Participant number_____

Part 1

Coding Strongly disagree - > Strongly agree (1,2,3,4,5,6,7)	CODE	(1-7)
1. ผู้เล่นพยายามแก้ปัญหาภายในกิจกรรมในเกม (Participant works on solving problems within the game. [involvement]	**A11**	
2. ผู้เล่นเสียสมาธิหรือมีสิ่งรบกวนเพียงเล็กน้อยในขณะแก้ปัญหาThere is minimal distraction from solving problems in the game. [concentration]	**A21**	
3. ผู้เล่นสนใจแต่การกิจในเกมParticipant becomes focused on the tasks in the game. [concentration]	**A22**	
4. ผู้เล่นสามารถปรับดุลความสเถียรภาพของปัญหาภายในเกมParticipant can work on refining the integrity or stability of a problem solution within the game. [stability]	**A31**	
5. อ็อบเจกต์ และ เครื่องมือในเกมพร้อมให้ผู้เล่นใช้ได้อย่างเหมาะสมIn-game objects and materials are able to be readily manipulated. [set breaking]	**A41**	
6. ผู้เล่นสามารถปรับอ็อบเจกต์ และ เครื่องมือในเกมตามแนวทางของตนเองเพื่อบรรลุวัตถุประสงค์เบื้องต้นในเกมParticipant manipulates objects and materials that can be used in different ways to the primary purpose. [set breaking]	**A42**	
7. ผู้เล่นสามารถเร่งความเร็วจากช้าไปเร็วตามระดับภายในเกมThe speed at which participant is required to interact within the game progresses from a slow to fast gradient of working rate. [pace]	**A51**	
8. การวางแผนคือส่วนสำคัญในการเล่นเกมPlanning is an important part of game play. [planning]	**A61**	
9. เกมขึ้นอยู่กับการจัดการภายในเกมThe game relies on the organization or manipulate of objects as a part of game play. [planning]	**A62**	
10. ผู้เล่นสร้างแนวความคิดของตนเองได้ขณะเล่นเกมParticipant is able to establish ideas within the game. [planning]	**A63**	
11. ผู้เล่นสามารถวางแผนเป็นขั้นเป็นตอนขณะเล่นเกมParticipant can plan the order of actions and steps to take within the game. [planning]	**A64**	
12. ผู้เล่นรู้สึกอยากรู้อยากเห็นขณะเล่นเกมParticipant can engage in game tasks in a curious manner. [playfulness]	**A71**	
13. เกมสามารถตอบสนองการลองคิดสิ่งใหม่ๆ หรือทดลองแนวคิดของผู้เล่นได้The game provides opportunities to try out ideas in a carefree way. [playfulness]	**A72**	
14. ความอยากรู้อยากเห็นทำให้ผู้เล่นค้นหาแนวทางต่างๆก่ยในเกมCuriosity during game exploration is encouraged. [exploration]	**A81**	
15. เกมสนับสนุนการทดทองแนวคิดของผู้เล่นThe game encourages playful testing out of ideas. [exploration]	**A82**	
16. ผู้เล่นรู้สึกเป็นช่วงเวลาที่ดีในการเล่นเกมThe game allows players to have a good time. [Enjoyment]	**A91**	
17. กิจกรรมในเกมสร้างความสนุกGame play tasks are pleasurable. [Enjoyment]	**A92**	

	CODE	
18. เกมให้ผู้เล่นรู้สึกมั่นใจในการเล่นThe game allows participant to feel assured in going about required tasks. [Assuredness]	**B11**	
19. ผู้เล่นรู้สึกมีความสามารถในการเล่นได้ดีParticipant feels certain about his/her ability to complete tasks in the game. [Assuredness]	**B12**	
20. ผู้เล่นสามารถเดากิจกรรมต่างๆได้ภายในเกมขณะเล่นParticipant demonstrates little doubt about what she/he required to do during the game play [Assuredness]	**B13**	
21. ผู้เล่นไม่รู้สึกท้อแท้ขณะเล่นParticipant doesn't feel anxious or timid as participant plays the game. [Assuredness]	**B14**	
22. ผู้เล่นเผชิญปัญหาภายในเกมขณะเล่นเกมParticipant encounters problems as participant plays the game. [Assuredness (-)]	**B15**	
23. กิจกรรมภายในเกมยากต่อการเล่นของผู้เล่นIt was difficult to complete tasks in the game. [Assuredness (-)]	**B16**	
24. มีความยากในการจัดการกับ **Object** ในเกมIt was difficult to work with the objects/resources in the game. [Assuredness (-)]	**B17**	

Part 2

Coding	CODE	นับครั้ง
25. ผู้เล่นย้อน ยกเลิกกิจกรรมบางกิจกรรมในเกมParticipant reverses or undoes steps/actions performed in the game. [exhibited uncertainty (-)]	**B21**	
26. ผู้เล่นรู้สึกไม่มั่นใจที่จะสามารถเล่นเกมได้จนผ่านเสร็จParticipant feels uncertain completing tasks in the game. [difficulty (-)]	**B31**	
27. ผู้เล่นรู้สึกสามารถเดากิจกรรมในเกมได้Participant has feelings of self-doubt while playing the game. [difficulty (-)]	**B32**	
28. ผู้เล่นส่งเสียงในทางลบขณะเล่นเกมParticipant produces negative statements about his/her ability as participants play the game. [difficulty (-)]	**B33**	
29. ผู้เล่นส่งเสียงที่แสดงไม่พอใจกับเกมParticipant produces negative exclamations (e.g. curses) as participant plays the game. [difficulty (-)]	**B34**	

Part 3

Coding Strongly disagree - > Strongly agree (1,2,3,4,5,6,7)	CODE	1-7
30. ผู้เล่นเผชิญปัญหาภายในเกมขณะเล่นให้ผ่านแต่ละด่านParticipant encountered problems while completing tasks in the game. [Striving]	**B41**	
31. ผู้เล่นมีอุปสรรค์ในการผ่านด่านต่างๆParticipant encountered obstacles while completing tasks in the game. [Striving]	**B42**	
32. ผู้เล่นมีคำถามที่จะผ่านแต่ละด่านParticipant questions what to do at particular stages in the game. [Striving]	**B43**	

Part 4

Coding	CODE	นับครั้ง
33 ผู้เล่นแก้ปัญหาที่ละด่านโดยแก้ปัญหาที่ละจุดจนกว่าจะสำเร็จThe current problem that needs to be solved in the game requires more than one step. [wide focus]	C11	
34 ปัญหาที่พบแต่จะจุดเป็นการนำไปสู่การแก้ปัญหาด่านต่อไปThe current problem in the game is future oriented. [wide focus]	C12	
35 ผู้เล่นกลับมาแก้ปัญหาเก่าที่ผ่านมาหลังจากที่ผ่านบางจุดไปแล้วParticipant restates the problem presented by the game. [wide focus]	C13	
36 ผู้เล่นสามารถพัฒนาวัตถุประสงค์ของตัวเองได้ในขณะเล่นParticipant is able to develop his/her own goals within the game. [wide focus]	C14	
37 ผู้เล่นทำบางอย่างที่ไม่เกี่ยวกับกิจกรรมในเกมParticipant is performing actions not related to game tasks/goals. [wide focus]	C15	
38 ผู้เล่นเปลี่ยนกิจกรรมหรือทำบางอย่างขณะเล่นเกมParticipant transitions to a new topic area or action in the game. [Striving]	C21	
39 ผู้เล่นรู้สึกสงสัยว่าจะผ่านแต่ละด่านอย่างไรParticipant questioned how to complete tasks in the game. [Striving]	C22	
40 ผู้เล่นสงสัยว่าตอนนี้กำลังทำอะไรอยู่Participant questions his/her current actions in the game. [Striving]	C23	
41 ผู้เล่นพูดหรือทวนคำพูดบางอย่างตามเหมือนที่เกมพูดParticipant repeats instructions, words or concepts presented in the game. [Striving]	C24	
42 ผู้เล่นควนครางคำพูดบางอย่างในเกมParticipant makes exclamations, as a positive or negative outburst. [Striving]	C25	
43 ผู้เล้นพูดว่าชอบหรือไม่ชอบเกมParticipant makes statements of like or dislike about game tasks. [Concrete focus]	C31	
44 ผู้เล่นพูดถึงคุณภาพของเกมในเรื่องการออกแบบParticipant talks about the qualities of the materials, objects or attributes of the game world. [Concrete focus (-)]	C32	
45 ผู้เล่นบรรยายการเล่น กิจกรรม หรือประโยคต่างๆในเกมParticipant describes action/tasks/goals in terms of analogies or metaphors. [Concept identification]	C41	
46 ผู้เล่นอุทานออกมาขณะเล่นเกมParticipant had eureka-type moments in the game. [Concept identification]	C42	
47 ผู้เล่นหยุด เปลี่ยนกิจกรรมบางอย่างเพื่อให้เล่นเกมได้Participant has an abrupt change in activity designed to help complete a task. [Concept identification]	C43	

Cultivate Mindfulness: A Case Study of Mindful Learning in an English as a Foreign Language Classroom

Yang Wang and Chao Liu

Abstract

This case study investigated how the use of mindfulness affected college English as a foreign language (EFL) students learning and how mindful learning strategies supported their learning of English. Mindful learning considers the students' abilities to be aware, perceive and conceive. Mindfulness results in an increase in competence, memory, creativity, and positive affect based on the previous studies. In this study, 24 undergraduate freshmen participated at a Northeastern University in China. The data collection included those undergraduates' pre-surveys, post-surveys, work samples, the instructor's observation notes and the researcher's reflective journal entries. This practice found that by engaging in mindful strategies, EFL students took ownership of their learning in the following ways: students built and became aware of a comfortable learning environment in their classroom through mindfulness; mindful writing helped students generate new thoughts and become aware of their thinking; mindfulness facilitated their learning process, cultivated creativity and intelligence; mindful cooperative learning provided students with an opportunity to discover their awareness, learn from others, reflect and think critically.

Keywords: mindful learning; mindfulness; English as a foreign language learning; college learners; case study.

Introduction

"Many of my students don't seem to care about learning a foreign language. They are sitting in my classroom; however I don't think they are aware of what they are learning." Mr. Liu brought this up when we chatted about teaching English as a Foreign Language (EFL) over coffee. Mr. Liu is an English language instructor at a northeast university in China and we have been working together and sharing ideas on teaching and learning EFL for many years. Both of us realized learning English as a foreign language has been a great challenge for those learners who live in a non-native-English-speaking environment. We have had many EFL students learn English language in this way: they spent plenty of time and effort in memorizing vocabulary and grammar rules, practicing reading comprehension skills, writing three-paragraph-essays, listening to audio recordings, imitating after video clips, and seeking chances to speak English or converse with a native speaker. However, little attention is given to the awareness processes during the learning of English. Many EFL learners compliantly follow their teachers' instruction, keep notes andmemorize the lectures. They passively deposited the input that was passed by their teachers like a banking system (Freire, 2000), without paying much attention to their awareness or mindfulness.

At all the universities and colleges in the mainland of China, English language is one of the mandatory courses. EFL learners are eager to boost their knowledge of English language and culture, in order to become competitive globally. Thus, many teachers and educators practice and search for effective instructional strategies forcollege EFL learning. Both of us, as researchers and teachers, believed using mindfulness would help the adult EFL learners become aware of their learning process and make achievements. However, little work has been done using mindfulness with adult EFL learners.

The purpose of this case study was to explore mindfulness in an English as a foreign language classroom at a Northeast university in China. At this stage in the research, we define mindfulness as the ability to be aware and inquire (Cooper & Boyd, 1996; Hassed & Chamber, 2015; Siegel, 2007). Mindful learning means learners have the ability to be aware, to perceive, and conceive during their learning process (Cooper & Boyd, 1996). This research investigated how mindfulness affected adult EFL students learning English in class, and what mindful strategies supported their learning.

Literature Review

Mindfulness may be simple but it is not easy. Mindfulness is "not just about meditation; it is also a way of living with awareness" (Hassed & Chamber, 2015, p. 7). It is an intrinsic process requiring effort and discipline (Siegel, 2007). In the book *The Mindful Brain*, Siegel (2007) stated that mindfulness enlightens us to come to a deeper understanding and lead us to new ways of living in this world. Mindfulness appreciates our feelings and empowers us to explore our creativity and intelligence. It guides us to reflect on our own life and learn from it. However, mindfulness does not happen automatically. This process takes effort.

Cooper and Boyd (1996) discuss their thoughts about using mindfulness in teaching and learning. They consider teaching is a process of facilitating and uncovering skills. Also, to be mindful means to expand students' thinking. They state, "Mindfulness takes into account the student's inclination to search, to inquire. It considers the student's ability to be aware, to perceive and conceive" (p. 9). Mindfulness involves refining, thinking, formulating meaning and benefiting from learning. In an effective mindful class, the teacher helps his/her students build meaning, reflect on their learning, and make use of their learning.

Mindfulness creates other benefits for learning. Langer (2000) presents that mindfulness can result in "an increase in competence; a decrease in accidents; an increase in memory, creativity, and positive affect; a decrease in stress; and an increase in health and longevity" (p. 220). In addition, Brady (2004), a meditation practitioner as well as a teacher, agrees that if we became aware of the negative thoughts and feelings and developed ways to replace them with positive ones, we would live happier lives. Students could appreciate mindfulness in class and teachers would benefit from the advantages of mindfulness.

Mindful learning relates to reflection. Cooper and Boyd (1996) state that "mindful learning is dependent upon learner reflection and mindful reflection requires mindful learners" (p. 61). Meanwhile, they point out that teachers play various roles in a mindful class: they display interpersonal skills, think critically, exhibit creativity, communicate effectively, develop personal wellness, demonstrate global responsibility, and assess and use information. Additionally, the authors affirm that teacher and students need to build a mindful learning environment in class, where students are encouraged to think, are interested in studying and working, are respected and respect each other, and are continuously supported and challenged.

Numerous instructional strategies can be applied to support mindful learning in the classrooms. For example, Campbell (2009), along with Cooper and Boyd (1996) include using graphic organizers, asking and improving questioning skills, and using mindful assessments in their strategy lists. Also, Campbell (2009) incorporates technology for students who are interested and enjoy using technology to learn mindfully. Boice (1994) studies that mindful free writing (writing about whatever comes to mind) helps with writing fluency and creativity. Moreover, Brady (2004, 2007, and 2008) practices cooperative learning, writing prompts, as well as free writing in his class, and proves that those strategies all facilitate the students' learning. Furthermore, Langer (1997) discusses that many indirect factors contribute to mindful learning: openness to novelty; alertness to distinction; sensitivity to different contexts; implicit awareness of multiple perspectives; and orientation in the present. Goguen-Hughes (2011), working at a contemplative teaching and learning institute, states that mindfulness helps learners become more reflective and accept diverse views.

Our study was inspired by Richard Brady (2004), who worked with high school teachers and students. Brady brought meditation to a high school classroom where the practices of mindful strategies improved the students' learning. We shadowed Brady's work and our goal was to explore how mindful learning would affect EFL students' English learning. Our case study (Creswell, 2007; Merriam, 2009; Yin, 2014) was guided by the following questions: How did the use of mindfulness affect college EFL students learning of English? How did the mindful learning strategies support college EFL students learning of English? This article weaved together the voices of various participants – the researcher, the teacher, and the students.

Methodology

This qualitative case study was conducted in a freshmen's EFL classroom at a Northeast university in the Mainland China. Our bounded unit of this case study is the group of EFL students learning English mindfully with their teacher's facilitation. We framed our work within constructivism and believed that people co-construct their theories and knowledge by experiencing and reflecting (Denzin & Lincoln, 2000). We construct our beliefs and knowledge of learning English language in a mindful way through this study.

Mr. Liu obtained a Linguistics and Applied Linguistics Master Degree and was an English language instructor for eight years at the study univeristy. H continually explored effective instructional strategies to use with his EFL students. He was a yoga practitioner and practiced

meditation in a weekly yoga class. He was willing to implement meditation in his class after we talked about the possible outcomes of this mindful learning project.

Mr. Liu's students in this comprehensive English class all participated in the study. They majored in International Business, were about twenty years old and had been learning English language for nearly nine years in a non-native speaking environment. Seventeen participants were female and seven were male. Mr. Liu and his students met three times a week, one and a half hours each time with a ten-minute recess. The learning content focused on a textbook titled *Contemporary College English* (Yang, 2009), which was widely adopted at universities and colleges in the Mainland China. Each unit included a vocabulary learning section, reading section, interactive activities section, unit review section, worksheet section, and test section.

At most class meetings, before we introduced mindfulness, Mr. Liu played music, mainly popular songs in English, when the students walked into the classroom in order to create a lighthearted English learning environment in his classroom. In addition, he often played video clips to preview a new unit, prompt a discussion, or review the learning material. His class routine included his lectures of the new knowledge, the students' individual reading time, worksheets and exercises, group discussion, and the time set for questions and answers. The teacher taught to the test and the students memorized vocabulary and got ready for the test. Mr. Liu generally held the role of authority figure in the classroom...

We practiced mindful strategies in Mr. Liu's classroom for three months in a spring semester. The strategies we incorporated in class included graphic organizers (Campbell, 2009; Cooper & Boyd, 1996), word definition diagram (Campbell, 2009), improving questioning skills, using mindful assessments (Cooper & Boyd, 1996), cooperative learning (Brady, 2004, 2007, 2008), and mindful writing (Boice, 1994). We integrated all the strategies along with guided meditation (Brady, 2004). Students did meditation before or during the classroom activities at least once a week. Mr. Liu led a one-minute meditation in the beginning of the study and then slightly extended the time length of meditation when the students became familiar and comfortable with meditation.

The data collection included students' pre-survey, work samples, semi-structured interviews, the teacher's observation notes, and researcher's reflection journals. The pre-survey was conducted before this study to learn about the students' learning strategies, attitudes on learning and working in this EFL classroom. Throughout this study, we collected the students' work samples, including in-class graphic organizers, writing reflections, and presentation slides. The interviews, conducted after the study, aimed at finding out how mindfulness affected and how mindful strategies supported the learning process. Mr. Liu kept his observation notes, and I kept reflection journals related to applying mindfulness in this study. The data analysis started along with data collection and all data were open coded for patterns (Creswell, 2007; Merriam, 2009; Yin, 2014). The themes that emerged from the data answered our questions.

Results

The pre-survey revealed the participants' attitudes in learning English as a foreign language. The participants reported that they were satisfied with their current learning methods: they learned mainly from their teacher's lectures, joined the class discussion and group work, did a few hands-on activities, and used technology assistance, for instance, playing English songs, the PowerPoint slides, and video clips. The students also reported in the pre-survey that they would like to learn through interesting activities, such as listening to popular songs in English, watching Hollywood movies and popular television shows, reading authentic novels and magazines, having more opportunities to speak in English, and communicating with English

native speakers. Their surveys revealed that whenever they were motivated in learning, they were able to concentrate and achieve more. Additionally, they reported that improving their individual learning was a critical step before they contributed to group work. Moreover, they said that they appreciated when the teacher made more connections to the real world and their prior knowledge. Those responses helped Mr. Liu and I learned about the students' interests, and their English learning. Based on what we knew about the students, Mr. Liu and I borrowed some mindful learning strategies from the literature and modified them for his students.

Meditation

The first time Mr. Liu brought meditation into class was when the students responded to their reading in small groups. His students, in groups of six, read a text named *More Crime and Less Punishment* from their textbook (Yang, 2009). After the students read it aloud in small groups, Mr. Liu brought them together in a large group and led the meditation. Mr. Liu let the students sit in comfortable positions on their chairs and take deep breaths. They sat still in silence and closed their eyes for a one-minute meditation. Mr. Liu guided them to relax and let their minds wander. After the meditation, the students free wrote about their thoughts for five minutes. Then they shared their writing in a large group. Since it was the first time for the students to do meditation and free writing, Mr. Liu allowed them, if they struggled writing in English, to use their first language – Chinese. In that way, they were more comfortable writing about their awareness and expressing their thoughts. About half of the students free wrote in Chinese, and then we translated their free writing to English. For example, one student wrote:

> When the teacher asked us to close our eyes, I was nervous. Our group worked on the fifth paragraph. I just scanned it and there were so many words that I'm not familiar with. And I didn't read the other paragraphs carefully. When it's time to open my eyes, I notice that this paragraph is about …… [Translated from the student's response.]

Some other students like the one above reported that they were nervous and curious about how this would work. Several responded they did not spend enough time reading and the new words were distracting. However, they still grasped the main idea of the text and reported in their freewriting. Another student wrote:

> Actually I think we should have more metaphors, analogy, and examples in the texts. The big theories and persuasive language are so boring and make us struggle with understanding. The metaphor in the fourth paragraph really stood out. I like it. [Translated from student's response.]

This student critiqued about the text she read and discussed the way to improve the text. Both of those two students seemed to filter the useful information when they closed their eyes and reported in their writing. Their freewriting responses showed their cognitive reading strategies as well as their comprehension of what they had read. The meditation activity helped those students focus on their work and reflect on their own reading, which was also reported in their post-survey.

KWL Chart

The pre-survey revealed that the students loved doing group work, hands-on activities, and using visual aids. So the next instructional strategy Mr. Liu brought in class was doing a KWL chart. In this three-column chart, students listed: What do I **K**now? What do I **W**ant to Know? What have I **L**earned (Fisher, Brozo, Frey & Ivey, 2014). After reading another piece from the

textbook, the students did a two-minute guided meditation. Again, Mr. Liu reminded them to relax and be mindful of what they were doing. Then the students, in groups, filled in a three-column chart of "what I know, what I want to know and what I learned." During the group discussion, one member volunteered to be the recorder, and filled in the chart for what the group members already knew about an upcoming lesson, what they wanted to know, and what they have learned after the lesson. Here's one example (see Figure 1).

Figure 1. KWL chart from one group.

Figure 1 presents the KWL chart from one small group's work. When this group of students discussed their chart, they described how more than one recorder contributed to filling in the chart. Mr. Liu observed that they had a discussion which accurately expressed their thoughts and reflection after reading the given text. As figure 1 presents, they revised their written sentences and improved them for clarity. For example, under the *What I learned* column, one member first put in "All men are created equal." Then they seemed not satisfied with that so another member changed it to "All people should be treated equally." This shows that through the group discussion, their thinking and understanding went deeper and they expressed their thoughts in a more accurate way that they agreed upon. Mr. Liu also reported that after meditation his students concentrated more on their group work and more critical conversations emerged out of their group discussion. Nearly all students reported in their post-surveys that they loved discussing and working in groups. One student explained, "because everyone has different views, and it can also promote our friendship." The students became aware of their own learning and acquired new input in a comfortable environment.

Free writing

Besides group work, the students also achieved more outcomes in their individual work through mindfulness. After they read the text *The Man in the Water* (Yang, 2009), depicting a man who gave up his life to save others in an airplane crash, the students meditated for two minutes and then free wrote their individual responses to this story. Since they had experiencewith free writing by then, they were comfortable writing all their responses in English this time. Here

are some selections from the students' writing pieces (All the following selections are the students' original words, so please forgive any misspelling and grammar mistakes.):

> Maybe human is powerless comparing to nature, but human has emotion and kindness. When the man in the water handed life over to a stranger, he made a great impact on the total society. He won the fight. (From Student Tiange, all pseudonyms)

> What we learn from the man is that when you are in trouble, you can still be willing to help others which is one of the greatest conduct. (From Student Shiying)

> This reminds me of Huang Jian Xiang. (His reference to football). Nobody is a born hero, at the right moment everybody will be the hero. You cannot judge a man by his look. The real hero does not want to get any rewards when he makes contribution. (From Student Deyang)

> Like every other person, he was desperate to survive. However, facing with danger, he didn't hesitate and give the living opportunity to others, no matter how slow the effect of the cold. The spirit of commitment is worth to learn. But, in our opinion, life is precious, we can't risk our lives to try to be brave. We must make sure that we have the capacity to save others. We shouldn't act without reflection. So we should do everything with intelligence. (From Student Qianqian)

Similar to the above selected responses, many other students agreed on helping others and committing to society. Several students made connections to their real life. A couple other students, like Qianqian, criticized risking personal life to be brave and thought he should be concerned about his own safety and evaluate conditions before taking any initiatives. From their response sharing in class, Mr. Liu found that they understood the texts deeply after doing meditation and when they were mindful. The students not only learned the facts of the text, but also formed their own opinions. Additionally, they enjoyed joining in the group discussion while respecting each other's words. Students also reported that when they were mindful, they concentrated on writing, thought independently, and learned more.

Found Poem

The other mindful strategy Mr. Liu used was creating found poems. A found poem is one created by taking words, and phrases from the original resources and reorganizing them into a poem (Fisher, Brozo, Frey & Ivey, 2014). First, the students read an essay titled *Quick Fix Society* (Yang, 2009), from their textbooks. They volunteered to take turns reading the texts out loud in a big group. Mr. Liu reminded them to read slowly and be aware of what they were reading. During reading, they underlined or highlighted the words, phrases, and sentences to which they related or echoed. Then Mr. Liu guided them to do a two-minute meditation followed their reading. After the meditation, the students worked in groups of four to create one found poem with the texts they had marked. When Mr. Liu walked around the classroom, he noticed that the students were highly engaged. They shared their favorite words and expressions, discussed the theme of the text and the poem they wanted to create, then selected the words and organized them in the poem. They even varied the spacing and lines of their poems as shown in the examples.

Selected Poem 1 Untitled

The sky is crying,
And the wheels are spinning,
Across the gorgeous farms peasants working,
While my heart is paining.

I tried to defer the gratification,
But I couldn't help speeding imagination.
You said you didn't have affection,
However, I believe you are my destination.

Selected Poem 2 Untitled

Look at the rear-view mirror
There are herds
Remember how it makes us feel
And we will have to leave the quick fix society

We follow our hearts, now
Instead of later and faster
Instead of slower, superficially
Instead of thoroughly
That is gorgeous

Selected Poem 3 Untitled

Life is a journey
Everything passing by is gorgeous
But not everyone can catch it
We are always so anxious that we miss some of it
So please slow down
And appreciate it that we can find subtle changes

Selected Poem 4 Changing Life

To admit or not
        the world has changed
        we cannot escape

antique cars, Polaroid, chalkboards
        are in history
        also in my memory

ATM, where I get money
VCR, which I use to record life
        are in my mind

in my dream
I may sigh even cry
for missing the old life

but as time can fly
when tomorrow comes
I'll smile to the sky

After they created their poems in groups, the students shared them in one large group. They all volunteered to share and enjoyed the poem sharing time. It seemed that they started to embrace writing in English and gain more confidence in it. Mr. Liu commented that the found poem was his favorite strategy with mindfulness. Though it was the first time they created English poems in class, the students were highly involved in this activity and created beautiful poems. During group work, the students were aware of what they were doing; they cooperated with each other to select their words and sentences in groups; they all expressed their opinions actively; and they discussed the organization of the poem and edited them. The students also reported that they were "happy with their discussion and group work" and they benefited from being aware of what they did and how they did it.

Technology Project

In the pre-surveys, students reported that they would love the teacher to incorporate technology into their learning. Mr. Liu never considered himself to be a tech-savvy person; however, he incorporated as much technology assistance as he could in his class. Usually he represented his lecture through PowerPoint slides. In order to engage his students, he assigned them two technology projects. One was an individual task of teaching a vocabulary mini-lesson through a PowerPoint presentation; and the other was a collaborative project of creating a campus-life themed short film.

The students accomplished the first individual project in the computer lab at class time. Following a three minutes meditation, the students did individual brainstorming about their presentation plans. They listed out the meanings of their target words, made new sentences as

examples, differentiated them from other words with similar meanings, found more oral and written expressions using the new words, and gave real world examples. They used an online dictionary and resources as references. The students brought their awareness of learning to work on this project. They reported in their survey that when they became interested, their "mental power kept (them) focused." After they created their PowerPoint slides in the computer lab, they volunteered to teach the vocabulary mini-lessons to the big group during the next class meeting time. Here are two examples of the students' PPT slides (see Figure 2). The first one presents the differences between "appoint" and "assign." This student used Chinese to explain the word meaning, gave one example of each word in a sentence, and translated the sentence into Chinese. She color-coded the key words and selected the template by herself. The second slide presented the expressions of "breath." This student listed out 12 expressions using breath and their Chinese translations. When they taught in class, they projected the slides on the screen and shadowed how Mr. Liu taught vocabulary lesson. They explained the key points, asked interactive questions to the audience, and shared their slides on their campus drive so that the other students could get access.
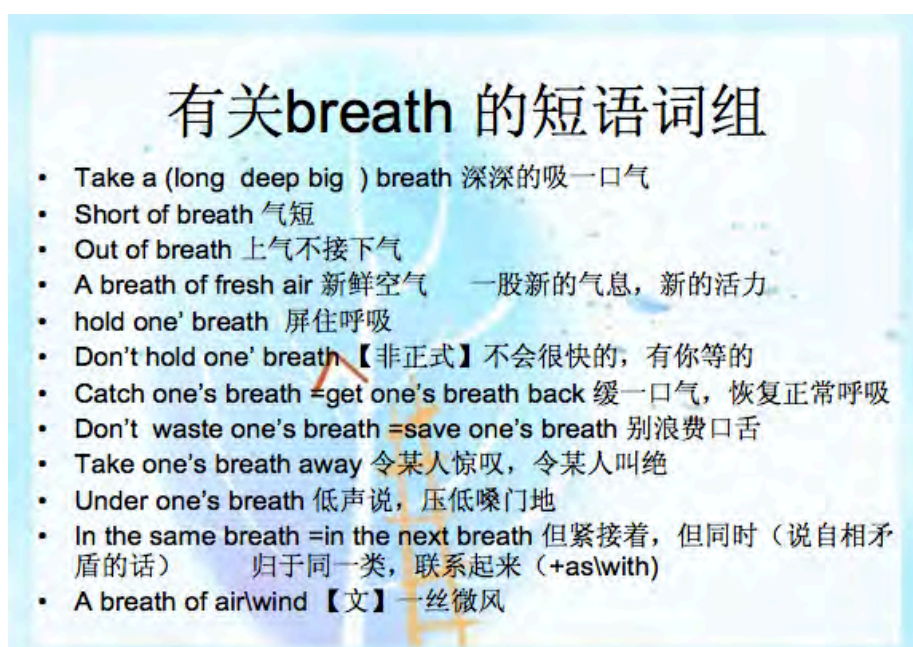
Figure 2. Students' PowerPoint slide examples

The students developed the other technology project of making movies as their homework and presented in class. They self-selected any topic of campus life, wrote the scripts, did their rehearsal, filmed, and edited after class. Mr. Liu reminded his students to work on their group projects mindfully throughout the entire process. He checked their progress in class. The students brought their group films to share in their last class. This collaborative video project turned out to be a great success. They were engaged in this interactive group work. The students reported that they "loved learning through these interesting activities" and were able to concentrate on their work when they were aware of what they were doing. In addition, Mr. Liu commented favorably on his students' magnificent film pieces. He said, "this couldn't be accomplished without mindfulness."

Discussion and Conclusion

Engaging in mindful strategies, the students took ownership of their learning. Through mindfulness practices, the EFL students built a learning community and became aware of this

comfortable social environment; mindful writing helped students generate new thoughts and become aware of their thinking; mindfulness facilitated the learning process, cultivated creativity and intelligence; mindful cooperative learning provided the students with an opportunity to discover their awareness, learn from others, reflect and think critically.

Mr. Liu and his students reported that they built up a stronger mutual respect between the teacher and the students and among the students. The students formed a closer relationship with each other. In such a community, the students became more willing to take risks, concentrated on their learning, and became more confident about learning English language. The students became aware of the process of learning English, they started to value their own learning process and became more motivated to learn and engaged in this process than before.

The EFL students generated new thoughts and became aware of their thinking through mindful experiences. When they read and discussed in small groups, they concentrated on constructing deeper meaning from the text rather than only decoding the word meanings. Their discussion expanded their thinking of the text meaning (Cooper & Boyd, 1996). In addition, during the practice of free writing, the students had a chance to cultivate new ideas, think deeply about their reading, think critically, and improve their writing skills. In the beginning, half of the students free-wrote in Chinese as they felt more comfortable expressing their thoughts in their first language; while toward the end, all of them wrote their reflections in English. This suggests they became comfortable and confident writing in English marking significant progress in learning English as a foreign language.

Mindfulness facilitated these EFL students' learning process, cultivating their creativity and intelligence (Siegel, 2007). When the students were mindful and the learning process was interesting, they became more concentrated and productive. All the mindful strategies adopted in Mr. Liu's class were introduced to his students for the first time. When they did the found poems, they were highly engaged in their reading, marking up the text, and creating their poems mindfully. The students focused on their tasks, were aware of the meaning of their reading, worked with their group members, and created their poems in a focused manner. They proudly shared their products and valued their mindful learning experience. Additionally, they created vocabulary lessons and taught them to their peers. Many students reported that they acquired more than what they expected from the mindful strategies. These findings suggest that mindfulness resulted in the students' creativity and positive learning effects (Langer, 2000).

The EFL students collaborated with their peers for many of the mindful strategies we introduced and we found that cooperative learning provided those students with an opportunity to discover their own awareness, learn from the othersand to reflect and think critically (Cooper & Boyd, 1996). The students were highly involved in group activities and they enjoyed working with their peers. Meanwhile, they acquired the English language from each other in this social environment (Vygotsky, 1978). When discussing and working on tasks in groups, the students had strong motivation to get involved and express their opinions on the texts they read. The exploratory talk (Barnes, 2009) in their discussion inspired their critical thinking, which led to a higher level of understanding and learning. For example, when they discussed the text, they read and filled in the KWL chart, they talked back to the author, questioned the content, and considered multiple perspectives. The students' mindfulness contributed to this achievement.

Introducing meditation and mindfulness, the teacher played a key role in the beginning phase, since this was an initial mindfulness study in this group and the teacher needed to facilitate and lead the process. Mr. Liu modelled and demonstrated for his students before asking them to

act. When the students built a meditation routine and became familiar with mindful strategies, Mr. Liu released the responsibilities and encouraged the students' involvement in their own learning process. Thus, the students became more independent and gained agency in their learning (Johnston, 2004; Lewis, Enciso & Moje, 2007). That is to say, the students learned actively and took ownership of their English language learning.

Limitations

During our practice of mindful learning, we have seen limitations along with this study. As a case study, the intent is to provide a rich, contextualized account. In this classroom, the teacher and the students already knew each other well. The rapport between the teacher and students definitely contributed to this practice. In other cases, it the relationship between the teacher and students and among the students will also contribute to outcomes. Also, Mr. Liu led the students to do a weekly short meditation. The length and frequency of meditating practice could possibly influence the students' learning.

Implications

This study explored a group of college EFL learners practicing several mindful learning strategies under their teacher's guidance. The study provides teachers with some insights in using mindfulness in college EFL learning. This study would be beneficial for learning English mindfully, improving English language skills via helpful strategies, arousing student interest, developing awareness, increasing confidence and increasing efficiency. In addition, college EFL teachers could use mindfulness to facilitate enhancing student awareness of learning, reducing stress, creating a comfortable environment, enhancing concentration, learning efficiently, and increasing achievement. Other EFL teachers could also borrow mindful instructional strategies for learners of different ages and from different cultural backgrounds. Classroom teachers could introduce meditation, and apply mindful strategies as we did. In doing this, teachers need to constantly remind the students to be aware of their learning and release the responsibility for mindful learning when the students start to take ownership. Further research could examine mindfulness in reading and writing areas respectively, for example, the relationship between mindfulness and metacognition of reading comprehension.

Final Word

As teachers and researchers, Mr. Liu and I learned about the benefits of cultivating mindfulness in an EFL classroom. We would like to explore and practice more instructional strategies that would be helpful for EFL students to be aware of their learning. Brady's (2008) metaphor of the mind provides insight into this process:

> The mind is like a television set. It has many channels, including, for example, the happiness, the boredom, the confidence, and the anxiety channels. Each person has the same channels, but some channels have better reception than others. The strongest one are default channels, ones that tune in automatically a lot of the time. (p.96)

We want to offer our EFL students the opportunities to be mindful of their awareness and of their English language learning process. Through resolving their own default learning channels, students will value their own learning and achieve more in their learning.

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A Study of Comparatively Low Achievement Students' Bilingualized Dictionary Use and their English Learning

Chen Szu-An

Abstract

This study investigates bilingualized dictionary use of Taiwanese university students. It aims to examine EFL learners' overall dictionary use behavior and their perspectives on book dictionary as well as the necessity of advance guidance in using dictionaries. Data was collected through questionnaires and analyzed by SPSS 15.0. Findings indicate that the subjects held positive perspectives towards the helpfulness of using bilingualized dictionaries in learning English whereas only roughly half of them formed the dictionary use habits out in the classroom. Frequency of looking up aspects of word information might be determined by classroom activities and assignments, in which both L1 and L2 information of head words were considered useful. This paper concludes by arguing that low proficiency students may need solid training in using L2 information in bilingualized dictionaries to expand their knowledge of English vocabulary. Implications and suggestions for classroom practice will also be made.

Keywords: EFL learners; comparatively low achievement students; bilingualized dictionary; book dictionary; dictionary use behaviors.

Introduction

Choosing the most appropriate dictionaries for language learners to accommodate their different needs in the EFL classroom is a common and recurrent problem for language teachers. When target language inputs are quite limited in real life, Taiwanese learners seldom have the chance to acquire English vocabulary in a natural environment. In order to expose learners to more of their target language, dictionaries might be an invaluable source of and effective reference to English as they can solve learners' problems by providing them with useful linguistic information and cultural insights. Especially when teachers are unavailable for immediate consultation, English dictionaries can serve as a means to filling this void. For non-native English speakers, advancing their English proficiency might be a life-long learning task and should not be merely confined to formal school education. When they proceed with English learning throughout their lives, learners need reliable information that they can refer to whenever they encounter and want to solve problems related to their use of the target language. Not only can good dictionaries provide learners with English cultural knowledge but also intrigue their long-lasting interest in learning the language. Hence, dictionaries can be a useful tool in turning users into independent problem solvers and autonomous language learners.

In the language classroom, learners are likely to make further progress in developing their target language if dictionary use can be integrated into their learning process. However, leaving students, especially beginning and lower proficiency level learners, to choose dictionaries for themselves might not cause an equally positive effect on their language learning. Many researchers such as Fan and Xiao (2006), Lou and Li (2012), Shi and Pan (2005), and Wang (2007) all argue that English learners need to choose the dictionaries in which the contents and characteristics can accord with their different English levels. Without being aware of how dictionary use can assist them in learning a language, learners might trap themselves into just getting by whenever they need to consult dictionaries. Hence, to such students, English teachers turn into a role model of successful English learners and professional dictionary users. Based on their teaching and learning experience, English teachers can advise students to choose dictionaries, compensate their lack of familiarity with English dictionaries, and improve their dictionary reference skills through proper training and exercises specifically arranged in the class.

Significant research related to the effectiveness of using dictionaries in boosting learners' L2 vocabulary and reading comprehension has been accomplished in Taiwan. The majority of the research focuses on educators' evaluative perspectives, whereas an understanding of actual dictionary users' perspectives is still limited and needs to be crystallized. Therefore, the purpose of the present study is to explore comparatively low English proficiency level students' perceptions towards their use of *Longman Active Study English-Chinese Dictionary* (LASECD) for one year in their general English courses at Wenzao Ursuline University of Languages (Wenzao, former Wenzao Ursuline College of Languages), Taiwan. This group of students' overall College Student English Proficiency Level Test (CSEPT) scores ranged from 120 to 150. In this study, data was collected through questionnaires in order to elicit information concerning the subjects' dictionary use behavior and their overall perceptions of LASECD. The questionnaires consisted of 29 items and were administered to 147 students. The findings revealed that about one-half of the participants perceived that they have formed habits of using LASECD in studying English. The findings also indicate the types of word knowledge which these students frequently sought out when they used LASECD. In addition, most of the participants held positive perceptions toward LASECD and their use of this dictionary. Please see the research results in the section of Findings and Discussion.

Literature Review

Many dictionaries are available in a variety of formats today: online dictionaries, dictionary APPs for smartphones, book dictionaries, hand-held pocket electronic dictionaries, and CD-ROMs. In explaining the main function of dictionaries in language learning, Béjoint (2002) and Lou & Li (2012) claim that after readers find out and check the meaning of unknown or unfamiliar words, they will not only read and comprehend the text but also improve their acquisition of vocabulary. Expanding the bank of vocabulary can move learners toward their long-term learning goals of using their L2 spontaneously and expressing themselves explicitly and completely. Tomaszczyk (1979, citing from Ryu 2006) pioneered research into dictionary use and investigated 449 Polish university students of English, foreign language instructors, and translators. The results showed that dictionaries were mainly used for translation, which is not a rare situation at all in EFL contexts. Bilingual dictionaries can quickly provide L1 equivalents of L2 words, making them popular among learners at all levels (Atkins and Varantola 1998; Baxter 1980) and particularly useful to L2 beginning learners (Béjoint and Mouli, 1987).

Among research into bilingual dictionaries, Knight's (1994) study showed lower proficiency learners' improved reading comprehension by using bilingual dictionaries to look up totally unfamiliar words. Other researchers, such as Hulstihn, Hollander and Grenadius (1996), found that learners of all levels can use bilingual dictionaries to learn vocabulary while advanced learners are more likely to use bilingual dictionaries to confirm their understanding of partially known L2 lexical items (Atkins and Varantola 1997; Hulstijn 1993; Knight 1994). In spite of quick consultation of L2 words and L1 equivalents, bilingual dictionaries have attracted criticisms as low level L2 learners might be put under wrong impression that they can find perfect equivalents in both languages. Due to limited information provided in bilingual dictionaries, Hunt (2009) argues that this weakness of bilingual dictionaries may transform language learning into "a matter of one-to-one word translation," (p.14) and in turn students might prefer to employ this strategy to deal with the meanings of unknown words directly. The advantages of quick consultation of L2 words and L1 translations in bilingual dictionaries should be acknowledged as they indeed help learners quickly understand the gist of new words. But, simplistic translations are very likely to blur learners' view of the correct concept of L2 knowledge and block their progress in developing L2 proficiency level.

On the other hand, monolingual dictionaries contain rich information of L2 words and usages, including definitions, word classes, example sentences, phrasal verbs, idioms, synonyms, etc. all presented in L2, which can deflect L1 translations of L2 words. By using monolingual dictionaries, learners can receive more L2 reading input, eliminate the possibility of making interference errors, train their thinking in English, and enhance their comprehension of L2 (Lou and Li 2012). Despite more reading that L2 learners can access through using monolingual dictionaries, the content of monolingual dictionaries used by native speakers and advanced L2 learners might lead to information overload to learners of L2 at the low proficiency level. While they are busy identifying the correct meaning of a new word, they might need to work out many other unfamiliar words suddenly appearing in an entry, without much benefit. In order to counterbalance the cons of bilingual and monolingual dictionaries and combine their pros, bilingualized dictionaries are published and growing in popularity. As Hartman (1994, p.243) suggests, bilingualized dictionaries are a "hybrid dictionary type" and "a compromise" between two types of L2 dictionaries so that learners can get the best of both worlds.

Laufer and Hadar (1997) claim that bilingualized dictionaries give low proficiency learners an additional choice of which types of information they need to refer to (e.g. L1, L2, and both).

Various aspects of L2 words are provided in bilingualized dictionaries. In addition to L1 equivalents, the definitions, example sentences, phrasal verbs, idioms, etc. of L2 words are all presented in both of learners' L1 and L2. Hence, unlike monolingual dictionaries, L2 information on L2 words provide an alternative to L1 explanations for lower proficiency learners. Also, they can enhance their understanding of L2 word knowledge and refine their ability to define L2 words by using L2. Other than that, for higher proficiency learners, bilingualized dictionaries can be used to ensure that their knowledge of L2 vocabulary is accurate (Laufer and Hadar 1997).

In the present study, LASECD (please see one page of the dictionary contents taken from LASECD in Appendix A) was chosen to help the comparatively low achievement university students at Wenzao become familiar with the wealth of information that bilingualized dictionaries offer. At the beginning of the fall semester in 2011, the participants' English teachers provided their students with a training session on dictionary use and exercises for a week. Then these teachers assigned the students to work on individualized glossaries of head words that these students learned in English classes. In their glossary, they wrote down English words, Chinese equivalents, parts of speech, example sentences, family words, and so on. In addition, the three teachers often designed and arranged activities which were relevant to the learning materials in class. They expected to help the students establish their habits of using LASECD, increase their experience of using bilingualized dictionaries to comprehend the reading text, and build vocabulary in order to have a positive influence on the students' vocabulary knowledge. The goal was for these students to reduce their reliance on Chinese translations of words and enrich their understanding of other kinds of knowledge concerning the words to be learned. Around the end of the spring semester in 2012, questionnaires were distributed to 147 students to generate their overall opinions of dictionary use.

To reiterate, as the dictionary is an indispensable instrument for L2 learning, how learners perceive their dictionary use behavior and their perspectives towards the dictionary which they are using can shed light on the instruction of dictionary use for educators.

Objectives of the Study

The present study aims at researching into comparatively low achievement university students' perceptions towards using bilingualized dictionary-*Longman Active Study English-Chinese Dictionary*-when they study English at university. Their perceptions will be identified to find answers to the following questions:

1. What is students' dictionary use behavior?
2. What types of information in the bilingualized dictionary do students look up?
3. How do students perceive their bilingualized dictionaries?
4. How do students perceive the helpfulness of using bilingualized dictionaries in learning English?
5. How do students perceive the instruction of dictionary use?

The findings of this study are expected to provide valuable information to understand how comparatively low achievement students evaluate their dictionary use in learning English. This study may also serve as a pilot study for further research into dictionary use in the university EFL context in Taiwan.

Research Methodology

The participants in this study were 81 freshmen and 66 sophomores, who were attending the required General English Level II Course, constituting a weekly five-hour integrated English skills class, in the 36-credit English program at Wenzao during the academic year 2011/2012. All these comparatively low achievement participants had roughly a homogeneous background in terms of their first language (Mandarin Chinese) and the amount of formal English instruction at Wenzao. Their overall College Student English Proficiency Test (CSEPT) scores were between 120 and 150, which are considered an indicator of their English proficiency. The anonymity of the questionnaire respondents was established by specifically asking them not to write their names on the questionnaires unless they were voluntarily willing to be interviewed in the future if necessary. Questionnaires were used as the initial survey instrument and the final questionnaires were composed of 29 items including two open-ended questions. The finalized questionnaires were written in Chinese (shown in Appendix B). Questions 1 to 27 used a five-point Likert scale, (item 1~4 and 19~27: 1=strongly agree; 2= agree; 3=somewhat agree; 4=disagree; 5=strongly agree; item 5~18: 1=always; 2= nearly always; 3=half of the time; 4=seldom; 5=never), and asked about the respondents' experience and perceptions of dictionary use. In addition, question 28 and 29 were two open-ended questions to elicit opinions from the students concerning the effectiveness of using dictionaries in English learning and the necessity of receiving instruction in dictionary use at the initial stage of the English course. The reliability of the questionnaire was established using test-retest on 46 EFL university students who were excluded from the sample. Chronbach alpha was calculated and found to equal .868 in the pilot study and .883 in the survey. The questionnaire data were gathered in the last 10 to 15 minutes of the students' class time, via prior agreement with the teachers. Of the 152 copies distributed, 147 copies were returned to the researcher, yielding a response of rate of 96.71%. Questionnaire data was analyzed through using the statistical software SPSS 15.0.

Findings and Discussion

In this section, questionnaire data is presented describing the habits and perceptions of using bilingualized dictionaries of 147 Taiwanese EFL university students under study. The research findings will be discussed by answering the five research questions mentioned earlier. In presenting the results of the study, the percentages of each item were calculated to describe and summarize the responses of the students. The results of the items that relate to each research question are presented in tables, and explanations are provided accordingly. For the purpose of illustration, *Longman Active Study English-Chinese Dictionary* will be abbreviated as LASECD in the following. The first research question: "What is students' dictionary use behavior?" was measured through 4 items (item 1~4) in the questionnaire and the responses are presented in Table 1.

Table 1. Habits in Using the Dictionary (response frequencies in percentages)

Item	Statement	1	2	3	4	5
1	I am in the habit of using LASECD.	2.8	16.6	37.2	40	3.4
2	I look up unknown English words in the LASECD.	2.7	19	29.3	45.6	3.4
3	I use LASECD when I study English at home.	2	9.5	27.9	54.4	6.1
4	I find LASECD helpful to me.	7.6	28.5	40.3	22.9	0.7

(1=strongly agree; 2=agree; 3=somewhat agree; 4=disagree; 5=strongly disagree)

As Table 1 suggests, 56.6% of the students agreed that they were in the habit of using LASECD. Though it cannot be sure whether these students used LASECD only for their English course use or also for their personal self-study purpose, around half of the students (51%) tended to look up unknown English words in this specific bilingualized dictionary. On the other hand, Table 1 also reveals that more than 60% of the students disagreed that they used LASECD at home, which might imply that these students saw using LASECD as a classroom requirement and yet learned how to make good use of this language learning tool to improve their English proficiency. The researcher believes this percentage is not satisfactory if students are expected to expand their word knowledge through using dictionaries as frequently as possible.

Whereas many of the students did not use LASECD outside the classroom, 76.4% of the students confirmed the helpfulness of LASECD. Based on this the researcher speculates that the students acknowledged the effectiveness of using LASECD in completing the task at hand no matter what it was. Indeed, during the past year the English teachers kept designing activities to focus their level-2 students' attention on vocabulary learning, to familiarize them with LASECD, and to improve their dictionary-use skills. By so doing, their students were explicitly informed and guided to experience how to learn English words, which might result in better retention and employment of vocabulary in their English outputs through using dictionaries. In response to the first research question, the above findings might suggest that these comparatively low achievement students coming from different learning backgrounds and fields of study would like to use LASECD, and the majority of them perceived it relatively helpful in their English study.

The second research question: "What types of information in the bilingualized dictionary do students look up?" was measured through 14 questionnaire statements (item 5~18). The percentages of their responses are presented in Table 2, and information students looked up in the dictionary are ranked in Table 3.

Table 2. Types of Dictionary Information (Response frequencies in percentages)

Item	Statement	1	2	3	4	5
5	I use LASECD to find out Chinese equivalents of words.	9.5	24.5	40.1	25.9	0
6	I use LASECD to find out English definitions or words.	8.8	30.6	33.3	27.2	0
7	I use LASECD to find out pronunciation of words.	6.1	17	25.9	43.5	7.5
8	I use LASECD to find out derived verb forms.	2.7	22.4	40.1	30.6	4.1
9	I use LASECD to find out collocations.	5.4	21.1	43.5	27.9	2
10	I use LASECD to identify the right meaning of words.	5.4	21.8	43.5	27.2	2
11	I use LASECD to find out parts of speech.	6.8	33.3	32	27.2	0.7
12	I use LASECD to find out family words.	7.5	22.4	38.1	31.3	0.7
13	I use LASECD to find out phrasal verbs and idioms.	6.1	22.4	38.8	32.7	0
14	I use LASECD to find out synonyms of words.	4.1	21.1	37.4	35.4	2
15	I use LASECD to find out opposites of words.	2.7	19	36.1	39.5	2.7
16	I use LASECD to find out example sentences.	12.2	30.6	30.6	26.5	0
17	I use grammar exercises in the learner's handbook of LASECD.	2	5.4	26.5	51	15
18	I use the picture dictionary of LASECD to learn vocabulary.	2	7.5	31.3	46.3	12.9

(1=always; 2=nearly always; 3=half of the time; 4=seldom; 5=never)

Table 3. Ranked Types of Information Looked Up in the Dictionary (*Response frequencies in percentages*)

No.	Type of information	percentages	No.	Type of information	percentages
1	Chinese equivalents	74.1	7	phrasal verbs and idioms	67.3
2	Example sentences	73.5	8	verb forms	65.3
3	English definitions	72.8	9	synonyms	62.6
4	part of speech	72.1	10	opposite words	57.8
5	collocations	70.1	11	pronunciation	49
5	right meaning	70.1	12	picture dictionary	41.1
6	family words	68	13	grammar exercises	34

The information most frequently looked up, Chinese equivalents, did not come as a surprise in response to these comparatively low achievement students' strong reliance on the meanings of unknown English words translated into their first language. The high ranking of example sentences, English definitions, part of speech, and the right meaning of words, family words, etc. perhaps can be explained by the fact that the students needed such information to complete the assignments or tasks in orafter class. Summer (1988) indicates that the definition with examples in the dictionary would benefit reading comprehension.

In order to help students improve their reading comprehension and avoid lack of consistency in using dictionaries, the English teacher asked their students to individually make a glossary of English head words from their textbooks or supplementary reading materials. Students either

chose by themselves or were assigned at least five key words every week, looked these words up in their LASECD in their free time, and wrote down Chinese equivalents, English definitions, parts of speech, and example sentences of these required words in their writing pads. Other information, such as pronunciation, usages, phrasal verbs and idioms, synonyms, opposite words, or extra word knowledge of associated lexical items were not compulsory in this assignment.

In addition, the English teachers asked their students to bring LASECD to the class from time to time to accomplish in-class tasks by finding out key information from their reference materials. By means of glossary and vocabulary learning activities, students could practice their dictionary search methods as well as have hands-on experience of viewing the richness of information in dictionaries. Hence, the overall results shown in Table 3 are somehow predictable. Grammar exercises were the least looked up. Grammar exercises in the learner's handbooks had been addressed in the beginning weeks of the first semester in 2011 as part of the instruction of using LASECD.

The third research question: "How do students perceive their bilingualized dictionaries?" was measured through 9 items (Question 19~27) in the questionnaire and the results are presented in Table 4.

Table 4. Perceptions of LASECD (Response frequencies in percentages)

Item	Statement	1	2	3	4	5
19	The layout of LASECD is designed properly.	11.6	51.7	34.7	1.4	0.7
20	The amount of vocabulary in LASECD is sufficient.	15.6	50.3	29.9	3.4	0.7
21	LASECD provides sufficient user guidance.	13.7	57.5	26.7	2.1	0
22	LASECD provides sufficient grammar exercises to familiarize users with this dictionary.	9.7	44.1	39.3	6.9	0
23	The picture dictionary of LASECD is interesting.	8.2	34.7	43.5	12.9	0.7
24	The experience of using LASECD is enjoyable.	10.2	38.8	42.9	8.2	0
25	The LASECD contents suffice my current needs.	13.6	52.4	30.6	3.4	0
26	LASECD defines words clearly.	15.6	49	33.3	2	0
27	I can easily search an entry in LASECD.	15.6	45.6	35.4	3.4	0

(1=strongly agree; 2=agree; 3=somewhat agree; 4=disagree; 5=strongly disagree)

As Table 4 suggests, merely 2% or so of the respondents (strongly) disagreed with the layout of LASECD, while approximately nine tenths of the participants (95.9% and 97.9%) responded positively towards the dictionary contents including its amount of vocabulary and user guide. As for grammar exercises, 93.1% of the students (9.7% strongly agreed, 44.1% agreed, and 39.3% somewhat agreed) reported their agreement with the importance of the workbook in the learner's handbook in assisting their familiarity with LASECD. In terms of the picture dictionary in item 23, a slightly lower percentage (i.e. 86.4%) here might respond to the second least frequent information looked up in LASECD as shown above in Table 3. Whether or not the picture dictionary is interesting, this finding may suggest that teachers can refer students to this picture dictionary when the topics in the textbooks are relevant to it such as body parts, action verbs, foods, musical instruments, sounds, directions, sports, and so on. After all, through careful selection by the publisher, the vocabulary words in the picture dictionary must be high frequency words used in real life, and can be learned systematically and collectively.

As Schmitt (2000) suggests, learners use visual images to create a strong connections with a word and its meaning to strengthen their memory of the word. In this view, the picture dictionary in LASECD can be a starting point and a likely role model for students to make individualized picture dictionaries through drawing and taking notes in their own glossary. The findings also indicate that more than 90% of the respondents claimed enjoyable experiences using LASECD. Furthermore, 96.6%, 98%, and 96.6% of the respondents agreed that the contents of LASECD can satisfy their current needs, and provide them with clear definitions of words as well as easy identification of an entry.

In response to the third research question, the results of the student questionnaire demonstrated that these comparatively low achievement students responded favorably to LASECD overall. Not only might such perceptions establish grounds for the students' future consistent use of LASECD but also indicate that LASECD has achieved user-friendliness to some extent to this group of students.

The fourth research question: "How do students perceive the helpfulness of using bilingualized dictionaries in learning English?" was answered through an open-ended question (item 28). Based on their experience, the respondents were told to include as much information as they thought necessary to answer the question: "How does LASECD help you learn English?" The findings are presented in Table 5.

Table 5. Comments on the Helpfulness of LASECD in Learning English

Item	Responses	Number of responses
28	**Positive comments:**	
	Overall word information	22
	Related to word information	
	- Usages	13
	- Synonyms	5
	- Pronunciation	4
	- Example sentences	2
	Extended learning	19
	Longer retention of words	15
	Clear definitions	13
	English definitions	12
	Chinese equivalents	7
	Amount of vocabulary	7
	Easy to search an entry	6
	Pictures in the dictionary	2
	High frequency words	1
	Useful when there aren't any electronic dictionaries	1
28	**Other comments:**	
	Not helpful	12
	Demotivation for using LASECD	1
	Not portable	1

In Table 5, most of the comments were made on overall word information in LASECD. For example, one student reported 'I think information is more detailed in LASECD than in my pocket electronic dictionary. I can easily find out complete information, such as thesaurus, opposite words, past tense, etc. This dictionary helps me a lot!' Related to word information, some students mentioned specific aspects of word knowledge in response to the question, such as usages (N=13), synonyms (N=5), pronunciation (N=2), and example sentences (N=2). In addition, some students confirmed their extended learning. For example, one of them reported that "I can learn much more when I use the dictionary because there is always other information I didn't expected to learn." Another student stated that "one English word can bring about many phrasal verbs and usages to help me learn more. Good!" In terms of longer retention of words, some students commented on this advantage of using dictionaries in paper form to learn English. As one of them reported, "… looking up English words in the paper dictionary can enhance my memory of them." Another student reported, "Using the bilingualized dictionary and taking notes in my glossary is the best way to memorize new words. Besides, word information is full and rich." 13 comments were made on the explicitness of definitions provided in LASECD. 12 comments were concerned with the helpfulness of English definitions of words in learning English, such as "I can learn how to explain a word in English," "There are no perfect Chinese translations of English words. So I want to know how to define a word in English," and "English definitions help me better understand example sentences, synonyms and opposite words." Other opinions were also proposed regarding Chinese equivalents, the sufficient amount of vocabulary in LASECD, search of an entry with ease, colored pictures, and commonly-used words in the questionnaire. However, a number of students made quite different comments on the helpfulness of using LASECD in English learning.

Most of their comments presented the tendency stating that instead of using LASECD they chose to use electronic dictionaries, including pocket electronic dictionary and internet dictionary, when looking up English words. Therefore, they reported that they did not benefit much from this reference book. Furthermore, one student mentioned the issue of portability of paper dictionaries. Limited convenience of paper dictionaries has been reported in many studies (e.g. Ryu 2006). This finding is not unexpected at all here. Overall, the majority of the comments generated from item 28 shed light onto the effectiveness of using LASECD in learning English in the present study. The students were aware of the extent to which their dictionary use could assist them in learning English words. All in all, L2 can only be acquired through learners' own efforts. As long as they would like to involve themselves in this learning task, they could gain a great deal from this language learning resource.

Lastly, item 29, "Do you think it is necessary to learn how to use LASECD correctly before you start to use it?" was used to elicit some ideas from students concerning the necessity of advance training or exercises in dictionary use to find the answer to the fifth research question: "How do students perceive the instruction of dictionary use?" 104 students checked "yes," 18 students checked "no," and 25 chose not to comment. Among these 122 respondents who checked the box, quite a few students stated their reasons in the questionnaires. Most of their responses demonstrated the importance of such guidance given in the beginning of their journey of using dictionaries. For example, dictionary users need to know English words are listed alphabetically in the dictionary, what symbols like [U] and [T] or abbreviations like BrE and phr v stand for, why some words are printed in bold colors or highlighted, and so on.

Such knowledge can assist users in quick searches of English words and interpreting and identifying information correctly when they look up words in the dictionary. Even though almost 83% of the respondents confirmed the importance of advance dictionary use training, a few students disagreed with this kind of dictionary use training, and stated that "I already know

how to use the dictionary," "we should learn how to use the dictionary on our own rather than learn it in class," and "we don't need to learn it particularly." In response to item 29, the majority of written comments present the overall outlook towards instruction in dictionary use as useful, helpful, and indispensable.

Conclusion

The present study examined the dicionary use of comparatively low achievement university students in the research context. In accordance with their English proficiency, LASECD was selected and used in the Level II English Course to help students arrive at better English vocabulary learning in the academic year 2011-12. English teachers guided their students in using this dictionary in the beginning of the fall semester. Students then became familiar with dictionary use through completing learning activities, exercises, and assignments in their English classes. After eight months of dictionary use (four months in semester one and semester two), the questionnaires were distributed to 147 students to generate their opinions of using LASECD and their perceptions towards this dictionary and its helpfulness in learning English.

The overall results of this survey suggest that these comparatively low achievement students could benefit from LASECD in learning English and started to build up the habit of dictionary use when looking up English words. Although less than 40% of the students would use it at home, the results suggest that 76.4% of these LASECD users found this dictionary helpful in studying English. It is a given fact that when users gain positive experience and hold positive inclinations towards this reference, they will be more likely to maintain their user habits and consequently expand their bank of English vocabulary. Thus, students' views on LASECD might correspond to their preferred style of vocabulary learning, which may provide implications for subsequent course design.

In this research, we can see that Chinese equivalents are the most frequently looked up information in the dictionary. As far as this group of students is concerned, perhaps it is not necessary to forbid learners at this low English proficiency level from looking up Chinese equivalents of unknown or unfamiliar English words. Rather, teachers can try to transfer students' attention to word information interpreted in the target language (i.e. English definitions), and guide them to employ definitions through making reference to example sentences suggested in dictionaries or creating new, correct sentences. As Baxter (1980, p. 334) argues, "(L2) definition is an alternative to the use of lexical items." Being able to define words in English can not only heighten students' confidence in using the language but also enhance their holistic understanding of new vocabulary. Hunt (2009) also suggests that consulting both L1 and L2 information might lead to students' better retention of word knowledge than gaining access only to L1 information. When learning a new word this way, students might process information more deeply and are likely to remember it. This benefit can counterbalance the time necessary for consulting words in book dictionaries.

Despite the strengths of the LASECD, the publisher might take into consideration student need for training sessions and exercises before theyindependent dictionary use. Such guidance can be arranged at the initial stage of the English course in order to help those who have not understood the correct concept of word information, who have yet acquired correct knowledge of dictionary use, and who have never been aware of this vocabulary learning strategy. In addition to teachers' instruction and the learner's handbook which has been compiled in LASECD, there are other possibilities for making this reference book more user-friendly and convenient. For example, a teacher's book can be designed to provide instructors with suggestions for dictionary use activities or classroom assessment to make sure whether or not

students have learned how to use LASECD accurately and efficiently. Professional guidance and useful exercises are both necessary for boosting students' understanding of how LASECD can help them learn English. As Hartmann (1991, p. 9) suggests, "it is not enough just to recommend dictionaries to our students. To help them reap the benefits of good dictionaries, they need to be taught explicitly how to use them." Both publishers and instructors can benefit by considering the relation between dictionary use, classroom vocabulary behavior, and students' success in finding words to meet their communicative needs among low level English learners as dictionary users.

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Appendix A: Contents of LASECD (one page taken from the dictionary)

Appendix B: Chinese-version of the Questionnaire

同學對於使用朗文進階英漢雙解詞典及英語學習之看法

親愛的同學:

　　本問卷目的在於瞭解同學使用「朗文進階英漢雙解詞典」及英語學習等相關問題。請依照提示，並根據個人情況，真實作答即可。為求資料的完整性及可用性，請務必回答問卷中的每一項問題。本研究結果將僅供學術研究之用。

　　感謝你的參與,若你對本問卷有任何疑問，歡迎隨時與陳思安老師聯絡。辦公室：至善樓310；分機號碼：5223；Email　　　　　　　　　　：99033@mail.wtuc.edu.tw。

請根據你使用朗文進階英漢雙解詞典之經驗來回答第1~19題。

題目	1 非常 同意	2 同意	3 還算 同意	4 不同意	5 非常 不同意
1. 我習慣使用朗文英漢雙解詞典。	□	□	□	□	□
2. 每當我遇到生字, 我使用朗文英漢雙解詞典查單字。	□	□	□	□	□
3. 我在家時使用朗文英漢雙解詞典學習英文。	□	□	□	□	□
4. 我覺得朗文英漢雙解詞典對我很有幫助。	□	□	□	□	□
題目	1 總是這麼做	2 幾乎總是這麼做	3 有一半的時間這麼做	4 很少這麼做	5 從沒這麼做
5. 我使用朗文英漢雙解詞典找出單字的中文意思。	□	□	□	□	□
6. 我使用朗文英漢雙解詞典找出單字的英文意思。	□	□	□	□	□

7. 我使用朗文英漢雙解詞典找出單字的發音。	□	□	□	□	□
8. 我使用朗文英漢雙解詞典找出單字的動詞變化。	□	□	□	□	□
9. 我使用朗文英漢雙解詞典找出單字的詞語搭配。	□	□	□	□	□
10.我使用朗文英漢雙解詞典找出單字的各種用法。	□	□	□	□	□
11.我使用朗文英漢雙解詞典找出單字的詞性。	□	□	□	□	□
12.我使用朗文英漢雙解詞典找出單字的其他相關字。	□	□	□	□	□
13.我使用朗文英漢雙解詞典找出單字的片語動詞及習語。	□	□	□	□	□
14.我使用朗文英漢雙解詞典找出單字的同義詞。	□	□	□	□	□
15.我使用朗文英漢雙解詞典找出單字的反義詞。	□	□	□	□	□
16.我使用朗文英漢雙解詞典找出如何使用單字的例句。	□	□	□	□	□
17.我使用朗文英漢雙解詞典中的學習手冊練習文法。	□	□	□	□	□
18.我使用朗文英漢雙解詞典中的圖解詞典學習單字。	□	□	□	□	□

請根據你對朗文進階英漢雙解詞典之看法來回答第20~28題。

以下為數字1~5所代表的意涵。1：非常同意；2：同意；3：還算同意；4：不同意；5：非常不同意。

	1	2	3	4	5

題目	非常同意	同意	還算同意	不同意	非常不同意
19.朗文英漢雙解詞典的編排合宜。	□	□	□	□	□
20.朗文英漢雙解詞典的字彙量足夠。	□	□	□	□	□
21.朗文英漢雙解詞典清楚解釋字典的使用方法。	□	□	□	□	□
22.朗文英漢雙解詞典的學習手冊提供足夠的文法練習,幫助我熟悉字典的使用方法。	□	□	□	□	□
23.朗文英漢雙解詞典的圖解詞典有趣。	□	□	□	□	□
24.使用朗文英漢雙解詞典的經驗愉快。	□	□	□	□	□
25.朗文英漢雙解詞典的內容符合我目前的需求。	□	□	□	□	□
26.朗文英漢雙解詞典清楚解釋字義。	□	□	□	□	□
27.我很容易在朗文英漢雙解詞典中找到我要的資訊。	□	□	□	□	□

28.請問使用朗文英漢雙解詞典對你在學習英文方面有哪些幫助? 請根據個人經驗,在下方空白處寫下你的想法。

29.在獨立使用字典之前，請問你是否認為需要先學習如何正確使用字典
   (例如：分的清楚什麼是詞性、不規則動詞變化、一詞多義、同類詞、
   詞語搭配、片語動詞、習語、複合詞等等)? 請勾選你的回答(是□ ; 否□) ,
   並在下方空白處說明原因。

將來有機會我們會與你聯繫,邀請你面談使用字典的英語學習經驗。 如
果你願意分享經驗,請在下方表格留下你的聯絡方式,謝謝。

姓名		電子信箱	
系所		電話號碼	
學生證號碼			

本問卷到此結束,感謝你的參與及配合。

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A concise and factual abstract is required (maximum length of **250 words**). The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

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Immediately after the abstract, provide a maximum of **6 keywords**.

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Appendices

If there is more than one appendix, they should be identified as A, B, etc.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

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