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INTEGRATING BLOCKCHAIN IN BUSINESS CURRICULUM: LESSONS LEARNED FOR THE FACULTY OF ECONOMICS AND BUSINESS

by Rohaya Mohd-Nor, Mahani Mohammad Abdu Shakur, Esmie Obrin Nichol, Mohd Uzairi Ahmad Hajazi, Bakri Abdul Karim and Suzila Mohamed Yusof

INTRODUCTION

Disruptive technologies such as Fintech and technological capabilities of blockchain and distributed ledger technology (DLT) have been acknowledged as having the potential to extensively disrupt, not just banking and financial service sectors, but also other business sectors such as insurance, education, healthcare, logistic and supply chain, retail and others. In this article, we share views and research findings with regards to integrating blockchain and DLT in the context of classroom teaching and learning activities. The main objective of our research is to explore the impact of blockchain and DLT innovations on curriculum design related to academic business programmes that are currently offered at the Faculty of Economics and Business, UNIMAS.

OVERVIEW OF BLOCKCHAIN TRENDS AND APPLICATIONS

In the education sector, blockchain technologies offer potentials as "an infrastructure for learner records that is permanent, secure, and offers reliable management for lifelong learning development, giving learners direct access and control over their achievements", and hence the technologies support student-centred learning approach. In the Malaysian context, the Ministry of Education Malaysia has started to implement E-Skrol blockchain application to curb problems with fake educational degrees and certificates (Cant, 2019). Recently, HSBC announced that it has pioneered Malaysia first blockchain transaction with the implementation of a letter-of-credit deal involving cross-border financial trading between Singapore and Malaysia.

In Singapore, CIMB Bank Singapore and iTrust has rolled out blockchain-based IOT (Internet of

Things) application to manage transaction flows of up to US\$100 million for corporate clients (Media Outreach, 2019). Blockchain technology has also been rolled out in the development of a smart city of Phnom Penh of Cambodia (Ming, 2019). In retail sector of the Asia Pacific regions, there has been an increased adoption of blockchain by retail enterprises in China, Japan, India, Australia and Singapore.

INTEGRATING BLOCKCHAIN IN BUSINESS CURRICULUM

To date, we have investigated the stages of these technologies that are integrated in the business operations in relation to accounting, finance and business management field areas. Using desk research techniques, we found that blockchain and DLT have started to gain popularity in Malaysia mainly among industry players in the financial and banking sector, where in this context, Bank Negara Malaysia has played its role well in building the fintech ecosystem and pushing for more adopters for blockchain & DLT applications in the sector. However, despite the increasing popularity of blockchain adoption in various business sectors, we found that none of the Malaysian higher education sectors has yet commenced a specialized, stand-alone blockchain & DLT academic programmes tailored for business students.

Asia Pacific University of Technology & Innovation (Malaysian branch) has just commenced their Bachelor in Banking and Finance with a specialization in Fintech, early this year. Blockchain has been integrated as a specialized module in the programmes. To date also, it was reported that several initiatives have already being started in the higher education

sectors such as UiTM, UPM, Taylor's University, International Islamic University Malaysia and Tunku Abdul Rahman University College (UTAR) with collaboration from blockchain industry players particularly NEM Foundation (Sani, 2018). Taylor's Uni has announced its Blockchain Lab powered by NEM to be used to train their students (Sani, 2018). Universiti Malaysia Sarawak (UNIMAS) has also started several initiatives since 2018 to train staff and students with regard to blockchain technologies and applications for R&D and training areas, via workshop trainings and seminars. UNIMAS is also one of the members of University Consortium on Blockchain Technology that participating in adopting e-Scroll system championed by the Ministry of Education Malaysia.

LESSONS LEARNED FOR FACULTY OF ECONOMICS AND BUSINESS, UNIMAS

Our research has successfully attained two milestones that bringing the impact at the Faculty of Economics and Business, UNIMAS in an effort to integrate blockchain and DLT applications in our curriculum design. The first milestone is in raising awareness and sense of urgency among the faculty colleagues with regard to responding to the needs of revamping the business curriculum to reflect on the global market trends in the era of Industry 4.0. We have proposed a new course to integrate blockchain and DLT components that will be conducted using immersive learning and will mainly integrate Problem Based Learning and

Simulation-based Learning to achieve the intended learning outcomes of the course.

The second milestone is related to the discovery of few potential ways to increase readiness of our colleagues to challenge their personal epistemology with regard to teaching and learning that contributing also towards future proofing profession in the Industry 4.0 era. One of the recommended approaches is by systematically disrupting the old T&L practices, using a combination of design thinking and change management model to humanize classroom. We postulate that when educators can challenge their personal epistemology in teaching their course, and seek to understand also their students' personal epistemology, they can effectively design T&L related intervention activities in classroom to systematically disrupt the old ways of teaching practices. This approach can be highly beneficial in the context of ensuring effective T&L delivery and activities related to integrating emerging technologies in business related courses such as blockchain and DLT.

For this type of new course, teaching elements that can include Use Cases, Design Thinking and TRIZ methods of problem solving are important to be used in the implementation of learning approaches using Problem Based Learning and Simulation-based Learning. It is also vital to form good collaboration with the industry players and involve them in the classroom T&L.

Acknowledgement

This research work is supported under UNIMAS SoTL Grant - SoTL/FEP/2018(1)/017 and supports Sustainable Development Goal 4, which is to ensure quality education, that is inclusive and equitable and promote lifelong learning, is delivered.

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LEARNING 3D COMPUTER ANIMATION VIA THE MODIFIED TEAM-BASED LEARNING (mTBL) APPROACH

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Background of TBL

"Team-Based Learning is an evidence-based collaborative learning teaching strategy designed around units of instruction, known as "modules," that are taught in a three-step cycle: preparation, in-class readiness assurance testing, and application-focused exercise. A class typically includes one module."

Team-Based Learning implementation is based on four underlying principles (Michaelsen & Richards, 2005):

- Groups should be properly formed, and teams are fixed for the whole course.
- Students are accountable for their preparation and for working in teams.
- Team assignments must promote both learning and team development.
- Students must receive frequent and immediate feedback.

Problem Statement

The current TBL approach is not suitable for art-based courses where semester-long projects are more practical-based, hands-on, and involved technical knowledge.

Background of the Course

GKN2113 Advanced Animation Studio I

This course introduces the complete process of 3D modelling and keyframe animation pipeline to the students. Throughout the course, students will idealise concepts through sketches and translate them into believable 3D visualisation.

Learning Outcome

By the end of this course, students will be able to:

- Differentiate proper modelling and texturing techniques to build polygonal and NURBS objects.
- Construct realistic visualisation of the 3D environment and interfaces within the virtual world.
- Demonstrate effective presentation and communication skills in developing 3D projects in a team.

Transferable Skills

Problem Solving, Written Skill, Verbal Communication, and Teamwork.

Learning Units

Production pipeline, Modelling, Texturing, Lighting, Rendering, and Animation.

Demographic

1. Second-Year Students (Design Technology-Animation).
2. Students formed their teams consisting of 4 members per team which lasted for the whole semester.

References

- Michaelsen, L., Richards, B. (2005). Drawing conclusions from the team-learning literature in health-sciences education: a commentary. *Teaching and Learning in Medicine*, 17(1), 85–88.
- Team-Based Learning Collaborative. (2016, November 3). Overview. Retrieved November 1, 2019, from <http://www.teambasedlearning.org/definition/>.

Activities & Assessment

PROJECT 1: The Artefacts (Team Effort)

PROJECT 2: The Game of Thrones (Class Effort)

FINAL PROJECT: 3D Character Model (Individual Effort)

Throughout the Process

1. Students and instructor, collaboratively, discussed and decided during the preproduction and production stages.
2. Student presented their progress and feedback were given immediately by instructor and peers.
3. Students were 'motivated' by their peers' progress.
4. Tips and tricks on solving technical issues were shared.

Outcome

Successfully produced an Animation Project presented in several exhibitions in Faculty of Applied and Creative Arts & National Art Gallery, Malaysia.



Insights from mTBL

1. Fostering independence, accountability, and reflectivity.
2. Students need to prepare before class which can be a challenge.
3. Short lectures are still essential to provide foundational knowledge and concepts.
4. The instructor needs to be ready for and open to various directions and students' choices.
5. Students are exposed to various levels of collaboration: individual, team, and class.
6. Based on students' feedback and instructor's experience, the teaching and learning sessions felt more interactive and active.

Significance of the mTBL Approach

The modified Team-based Learning (mTBL) can be adopted as an alternative assessment initiative to cover the MQF2.0 Learning Outcome Domains (LOD) such as Knowledge & Understanding, Cognitive, Practical Skills, Interpersonal Skills, Communication Skills, and Leadership, Autonomy, & Responsibility.

Acknowledgement

The researchers would like to thank the students for their participation in this study. The research is supported by SoTL grant [Ref: SoTL/FSGK/2018(1)/014].

REFLECTIVE WRITING AS A TOOL TO ASSESS AFFECTIVE DOMAIN: A CASE STUDY OF EDUCATIONAL FIELD TRIP IN A LINGUISTIC ANTHROPOLOGY COURSE

by Yvonne Michelle Campbell and Remmy Gedat

ABSTRACT

The three domains of learning - cognitive, affective and psychomotor, are equally important for the development of students. While the cognitive domain focuses on the mental skills and knowledge acquisition, and the psychomotor domain centres on the development of motor skills, coordination and physical movement, the affective domain, on the other hand, focuses on the feelings, values, attitudes, motivation and interest of a learner. However, due to the difficulty in measuring the elements in the affective domain of learning, most instructional and assessment scheme mainly focused on the cognitive and psychomotor domains. The purpose of this study was to measure the affective learning domain based on students' reflection writings, before and after a planned educational field trip in a Linguistic Anthropology course. 41 reflective writings were analysed using a content analysis approach. The analysis of the reflective writings revealed that learning occurred at all levels of the affective domains. However, while the majority of students achieved the two levels of receiving and responding to phenomena, not all students were able to achieve the three higher levels of the affective domain which are valuing, organization and internalizing values (characterisation).

Background Information

In the field of education, the three domains of learning, which are cognitive, affective and psychomotor are equally important for the development of students. Most courses emphasised on the cognitive domain which focuses on the mental skills and knowledge acquisition, especially at the undergraduate level. The psychomotor motor domain, on the other hand, focuses on the development of motor skills, coordination and physical movement. One of the least measured domains is the affective domain which focuses on the

feelings, values, attitudes, motivation and interest of a learner due to the difficulty in measuring the elements in the affective domain. In linguistics, most studies have examined the connection between instructional design and student performance within the cognitive domain. Oakland (1997) stated that more attention has been devoted to cognitive qualities than to affective qualities in the academic and research world. Due to today's large classrooms and multiple-choice exams, affective domain learning can be difficult to assess.

While the Bloom's Taxonomy (1956) of cognitive objectives is generally well-known, the affective objectives are somewhat less familiar. These include (1) receiving, (2) responding, (3) valuing, (4) organizing and (5) characterisation (Krathwohl, Bloom & Masia, 1964) which are Affective domain generally refers to emotions and feelings aspects of learning which includes temperament, personality, attitudes, values and motivations.



Figure 1: The affective domain (Krathwohl, Bloom, Masia, 1973) (Source: http://www.nwlink.com/~donclark/hrd/Bloom/affective_domain.html)

According to Oakland (1997), in order to assess the affective domain, some of the most common ways used assess affective domain is

through self-report, survey, questionnaires and checklist. However, one needs to apply multiple methods, sources and traits in other to be more accurate in assessing affective domain. Some of the methods proposed by Oakland (1997) are interviews, naturalistic inquiry, standardised and standardised self-reports, sociometric methods and case study.

In this study, self-reflection writing could be considered as part of a standardised self-reports because students used questions to guide them in writing the self-reflection. Therefore, based on the proposal of Oakland (1997), self-reflection writing is one of the means in which one can assess affective domain. According to Huba and Freed (2000), writing, especially short writings can be a suitable tool to assess changes in attitudes. Writing helps learners to construct meaning which are based on their experiences and information around them to which they have been exposed to. Therefore, when a person writes, particularly based on an instructional sequence, these learners reflect their thought and emotions (Emig, 1988).

METHODOLOGY

This study was carried out among students of an undergraduate course, *Introduction to Linguistic Anthropology* at the Faculty of Language and Communication, Universiti Malaysia Sarawak. The course was taught over a 14-week semester and one of the units taught was *Ethnography Approach* whereby students were exposed to the basics of carrying out ethnographic research methods such as interviews, observations, and taking field notes. In order to expose the students to real life ethnographic research, students were given the opportunity to experience hands on data collection through a planned and organized educational field trip.

The field trip was conducted in a longhouse in Kampung Sebuyau Iban, Sebuyau, Sarawak. For the purpose of this study, a planned field trip was organized. The trip was planned by using the Field Trip Planning Model proposed by Myers and Jones (2015) which included three important stages - pre-trip, trip and post-trip. Each stage focused on different elements to ensure that the trip was a success and objectives of the trip were met.

The students spent one day with the villagers to collect data related to their assessments

regarding language and culture. Upon returning from the trip, students were asked to write a self-reflection writing to describe their experience during the field trip. Questions were given to the students as a guide to them writing their self-reflection writing. In order to analyse the self-reflection writing, content analysis was used within the paradigm of qualitative research. 41 reflective writing were analysed

Open coding technique was used in this study, whereby each of the reflection writing was read to and action verbs from the affective domain were highlighted. They were then categorized according to the levels of the affective domain. For the sake of interpretation and to fully comprehend, both phrases and sentences were included. Since this study depended on qualitative research approach, it therefore needed contextualized interpretation. Therefore, the context and descriptive examples in the findings of this study cannot be separated and this allows individual inferences of transferability of the readers.

FINDINGS

Four emerging themes which are found in the self-reflection writing are (1) lessons learned, (2) values learned, (3) changes in perception and (4) motivation. Each of these themes are discussed in the light of the five levels of the affective domain.

Lessons learned

The theme of lesson learned involves the application of what the students have learned in the classrooms. First and foremost, the students showed that they were able to listen to what was told in class including conducting research before the field trip and making the necessary preparation. They were also very much and actively involved in the field trip. This relates that the students followed the instructors' instruction before the trip. Lesson learned is also reflected in that the students applied what they have learned in the classroom. This includes the methods used for data collection which mainly is interview as well as some aspects of observations and note taking.

The students also applied the ethics of interviewing informants which were also emphasized in the classroom. Students showed the ability to interact with others with respect, during the trip whereby they communicated

and listened with respect to the informants when they were collecting the data. The data in which they collected were also as required by the assessment. This shows the achievement of the first two levels of affective domain of learning, which are receiving and responding.

Values learned

The second theme which emerged is related to the values which the students' learned during the trip. This is in line with the third level of affective domain, which is valuing, and focuses on the worth or value a person attaches to a particular object, phenomenon or behaviour. This is reflected in how the students were sensitive towards cultural differences and respecting these differences.

Changes in perception

Changes in perception is the third theme found in the self-reflection writings in this study. In fact, it could be said to be one of the most significant themes since it arises in nearly all the writings. This theme could be related to the last level of affective domain which is internalizing values. This level focuses on values that controls the students' behaviour. This is reflected in how the students value people for what they are as well as changes in perceptions and attitude.

Motivation

Within this last theme, motivation exists in the form of how the students reflected that they enjoyed the trip and managed to learn so many things from the trip. Because of that, the students felt and preferred to have more field trips as a means to learn outside of the classroom and to understand more what they have learned in the classroom.

DISCUSSION

ACKNOWLEDGEMENT

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This study revealed four emerging themes found in the 41 self-reflecting writing which was done after an organized educational trip among students of a Linguistic Anthropology course. These four themes are (1) lesson learned, (2) values learned, (3) changes in perception and (4) motivation. Theme (1) lesson learned reflected the first and second level of the affective domain which are receiving and responding, while (2) values learned reflected the third level, Valuing. The third and fourth themes, changes in perception and motivation reflected the fifth and final level, which is Internalising Values.

From these themes, one could say that the field trip has in some ways developed the affective domain of learning of the students and to some extent, left some form of impact in their views and opinions. In fact, due to these impacts, the students felt that more trips should be conducted in the future within the programme because it has helped them experienced and applied first-hand what they were taught in class.

CONCLUSION

Self-reflection writing is one of the means to assess affective domain of learning since it is difficult to assess this domain as compared to cognitive domain of learning. However, self-reflection writing cannot be the one and only means to assess this domain since the writings itself can be very subjective. As evident in the result of this study, only four themes which reflected four levels of affective domain could be identified. Therefore, other means of assessment such as interviews, naturalistic inquiry, sociometric methods and case study should be incorporated as well.

REFLECTIVE PRACTICE, ACTIVE THINKING AND ACADEMIC PERFORMANCE



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INTRODUCTION

Reflective practice is a process to explore mental states of oneself and others (Bruno, Galuppo, & Gilardi, 2011). It allows students to experience deep learning as well as increases student active engagement and personal ownership of self-development (Threlfall, 2014).

This practice requires active thinking, which involves attention control and meta cognition.



OBJECTIVES

General: To explore the growth of reflective practice and active thinking among undergraduate psychology students

Specific: To evaluate the levels of reflective practice and active thinking; number of reflective response and academic performance

METHOD

Participants: 25; 1st year psychology students (UNIMAS), under KMY 1043 Personality & Individual Differences course (Sem 2-2018/2019)



Materials: 138 reflective practice documents

Procedures:

- 1-The students wrote reflective journal related to learning topics for **10 WEEKS**.
- 2-All reflective practice documents were uploaded on **Eleap**.
- 3-The instructor gave **personalised feedback** to each reflective practice (**every week**) based on the **FIVE levels** of reflective practice coding scheme:

CATEGORY 0: Non Reflective Practice (RP)/Very Low Active Thinking (AT)

CATEGORY 1: Declarative RP/Low AT

CATEGORY 2: Relational RP/Moderate AT

CATEGORY 3: Interpretative RP/High AT

CATEGORY 4: Critical RP/Very High AT



Analysis:

Content Analysis:

- detection of mental words, categorising into one of FIVE levels

Descriptive Analysis:

- cumulative classifications
- frequency of FIVE levels for each week
- average of reflective practice response & academic performance



DISCUSSION & CONCLUSION

- 1-This study supported previous research on the positive contribution of reflective practice.
- 2- It addressed the efficacy of response frequency to scaffold academic performance.
- 3-The improvement of reflective practice styles requires high level of effort, active thinking, and working memory.

FINDINGS

Figure 1: Overall classification of students' reflective practice styles

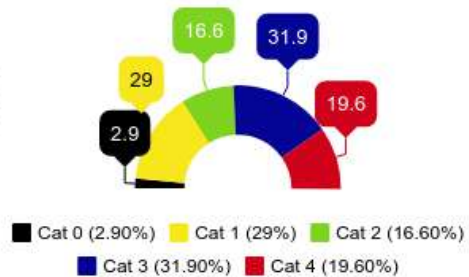


Figure 2: Frequency of reflective practice for each week according to five (5) levels

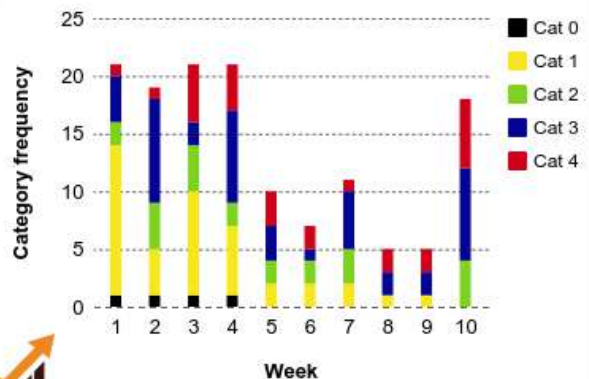
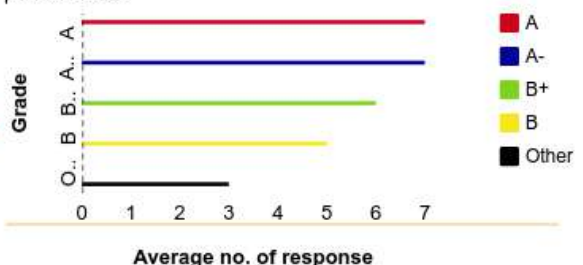


Figure 3: Average of reflective practice response & academic performance



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STUDENTS' AWARENESS OF ETHICS IN INFORMATION TECHNOLOGY

INTRODUCTION

Ethics in Information Technology is an elective course offered by the Faculty of Computer Science and Information Technology to all students except FCSIT students. It explores the issue of ethics related to information technology as well as highlights issues and ethical use of IT as a communication medium. Throughout this course, they are able to analyse problems related to ethical issues in a digital society.

RESEARCH OBJECTIVES

- To investigate students' awareness on ethics in Information Technology before and after enrolling in the ethics in Information Technology course.
- To design an assessment model that is able to evaluate students' knowledge and awareness of Information Technology ethical issues.

WHAT WE SHOULD KNOW?

- Ethics – set of beliefs about right and wrong behaviours in society.
- In the age of globalization, universities are responsible to make the students aware and competent in ethics.
- Professional ethics cannot be achieved completely during undergraduate years.
- The students should be assessed on their knowledge and skills in solving ethical dilemmas in engineering contexts.

RESPONDENTS

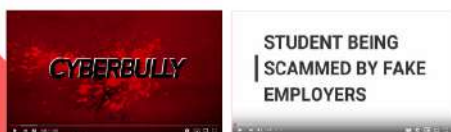
- N = 140 students (2nd year and above)
- 9 questions (Before & After)

COURSE ASSESSMENTS

- Infographic Posters



- Video

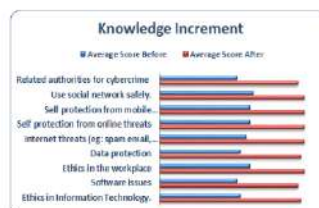


RESEARCH GRANT

Investigating the Awareness of Ethics in IT among UNIMAS Students and the Impact of this Related Course to Their Ethics in IT Field (SoTL/FSKTM/2018(1)/015)

RESULTS

There is a significant difference in the scores before ($M= 2.66, SD = .19219$) and after they completed the course ($M= 4.43, SD= .08734$) condition; $t(8)= -5.657, p = 0.000$.



100%

- course is beneficial
- should be offered to the university level
- has increased their knowledge about ethics in IT.

CONCLUSION

- Ethics course does have an effect on students' perceiveness while using information technology.
- The students are aware on Internet threats and know how to protect themselves.

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DEVELOPING RUBRICS FOR PERFORMANCE-BASED ALTERNATIVE ASSESSMENTS THROUGH COLLABORATIVE EFFORTS

by Souba Rethinasamy, Joseph Ramanair, Chong Yee Ling, Siti Haslina bt Hussin and Esmie Obrin Nichol

Background

Assessment is an integral part of teaching and learning. Alternative assessments which are based on actual performance are considered as more authentic as compared to conventional timed-impromptu tests. In the last two decades, alternative assessments have gained much importance not only in schools but also at institutions of higher learning. The multiple benefits of alternative assessment, which include performance-based assessment are often highlighted especially in relation to Education 4.0 as well as 21st century learning. Unlike traditional assessment where students' responses are checked against a single or a set of fixed sample answers, alternative assessment requires the use of rubrics to guide instruction and students' learning. The important roles rubrics play in alternative assessment especially in the process of teaching and learning, assessment and programme evaluation have been the focus of most empirical research in this area. However, educators often shy away from using rubrics due to the challenges faced in designing good rubrics. Although collaborative effort has often been advocated for tertiary level, how faculty members can work together in developing good quality rubrics have not been dealt sufficiently. The study endeavours to take up this recommendation and develop assessment rubrics for some common performance based alternative assessments in undergraduate courses through collaborative faculty effort.

Literature Review

Assessment is a crucial integral part of teaching and learning. In the last two decades there has been a major shift from traditional standardized tests to alternative assessment. Alternative assessment refers to all assessments that differ

from the traditional multiple choice, timed impromptu, one-shot approaches that characterize most standardized and classroom assessments (Aschbacher, 1993; Lopes, 2015.). Alternative assessment requires students to perform, create, produce or do something that use real-world contexts or simulations (Aschbacher, 1991; Brown & Hudson, 1998; Herman, Aschbacher & Winters, 1992). Examples of performance based alternative assessment include oral presentation, peer evaluation, written reports of projects, and portfolios (Brown & Hudson, 1998; Derakhshan, Rezaei, Alemi, 2011; Herman, Aschbacher & Winters, 1992; Peregoy & Boyle, 2013). Due to its multiple benefits in education, many institutions of learning including schools and higher education are also shifting from traditional assessment practise to more authentic performance based alternative assessment of students' learning (Dochy, Gijbels, & Segers, 2006). Unlike traditional assessments that have a predetermined answer or a set of sample responses, alternative assessment uses rubrics to assess learning. Rubrics are a set of criteria and descriptors for different levels of performance for a task or a family of tasks. While task specific rubrics is designed for and only applicable to one assessment, general rubrics can be used for a family of tasks. Descriptors in rubrics clarify the qualities required from students' works and thus provides the learning targets and can help students to build a concept of what it means to be good at and perform well (Brookhart, 2013). Rubrics also helps teachers to coordinate their instruction, students learning and assessment (Glickman-Bond & Rose, 2006; Hafner & Hafner, 2003; Quinlan, 2006). Rubrics also be used to provide feedback to students on diverse types of tasks performance-based assessments such as written assignment, oral presentation, peer evaluation and internship.

Andrade, Du, and Wan (2008) investigated the effects of providing assessment rubrics to students. The findings showed that provision of rubrics helped the students to self-assess and write better essays. They also pointed out the importance of having a good rubric to guide instruction and learning. Reddy and Andrade (2010) mentioned that studies of rubrics in higher education have been undertaken in a wide range of disciplines and for multiple purposes, including increasing students' achievement, improving instruction, and evaluating programmes. "While students' perceptions of rubrics are generally positive and some authors report positive responses to rubrics use by instructors, others noted a tendency for instructors to resist using them" (Reddy & Andrade, 2010, p. 435). The resistance is mainly due to the challenges faced in developing rubrics which include lack of knowledge and sources of guidance for developing good rubrics.

According Orrell (2003), one useful rubrics design strategy is to take a generic assessment rubric that matches well with the assessment task objectives, discipline, level and other contextual setting, and adapt it for own use, rephrasing the attribute descriptions to reflect the course context, aims and learning outcomes, and to apply to the specific assessment task. In addition, Dawson (2015) suggested that further research on rubrics to pay more attention to the development of rubrics in diverse contexts via discussion and debate.

Reddy (2007) emphasized that "assessment of students learning using rubrics is a change process, requiring considerable faculty involvement in terms of both time and effort" (p. 4). While the educational benefits of rubrics as an important assessment tool in assessing performance assessments are increasingly acknowledged, how faculty members can work together in developing good quality rubrics have not been dealt sufficiently. The objectives of this study are derived from the gap in the literature on rubrics.

Aim of the Research

The main aim of this research is to develop assessment rubrics for some common performance based alternative assessments in undergraduate courses through collaborative faculty effort.

Research Objectives

The objectives of this research are as follows:

1. to identify the criteria for assessing common performance tasks at undergraduate level of study (e.g. project written report, oral presentation, peer evaluation, lab report, & internship)
2. to create descriptors for the levels of performance for each of the criteria identified for the common performance tasks at undergraduate level of study
3. to develop an online platform for sharing of the sample rubrics

Methodology

The study uses a mix method approach to the development of the rubrics for assessing performance tasks for undergraduate study.

The study involves two major phases. During the first phase, a core team of lecturers representing various faculties in UNIMAS were chosen based on their teaching experience and involvement in performance assessment. This team brainstormed and outlined the criteria as well as the descriptors for the common performance assessment tasks utilized in their undergraduate courses.

The second phase will focus on eliciting lecturers' feedback on the drafts of the scoring rubrics developed by the core team members. The data will be gathered through a questionnaire and semi-structured interviews. The questionnaire will focus on the lecturers' opinion about the rubrics for assessments, while the semi-structured interviews aim is to elicit further explanation on the lecturers' responses to the questionnaire items. The study will include lecturers from various faculties. The feedback received from the lecturers on the drafts of scoring rubrics will be compiled, discussed by the core team members and used to refine the rubrics.

The final samples of the scoring rubrics will be uploaded on an online platform to be shared with academics in UNIMAS. The rubrics will serve as samples and guide for lecturers to adopt and adapt in the process of creating task specific rubrics for their own course performance assessments.

Results

The team met almost every week to discuss and develop drafts of the rubrics. During the meeting, group members brought along the rubrics used in their faculty. The group also looked into rubrics used at different institutions. Through extensive discussions, rubrics for project written reports, oral presentations, peer evaluation, and lab report have been completed. The rubrics for internship is still in progress.

Upon completing the first phase of the study, the second phase will commence to elicit lecturers' feedback on the drafts of the scoring rubrics developed by the core team members.

Acknowledgement

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THE DEVELOPMENT AND EVALUATION OF A SIMULATED WEB APPLICATION FOR ELECTRONIC HEALTH DOCUMENTATION: NURSING STUDENTS' EXPERIENCE, PERCEPTIONS, ATTITUDE AND INTENTION TO USE

by Chan KG, Cheah WS, Lee SLW, Chai LS, Goh M, and Gibreson I.

The preparation of nursing students as potential future professional nurses who would accept and utilize the electronic health documentation proficiently and effectively to meet the expectation of the nursing workforce is imperative. Simulated, educational web application for the students to navigate the technology in documenting and planning care for their virtual patients is timely and essential. It could be part of the teaching-learning activities to support nursing students in integrating theory and practice.

An earlier study, "Perceptions, Attitude and Intention to use simulated integrated nursing education system (iNES) among the nursing students" was conducted in 2016 (note: iNES was developed by the National University of Singapore). It shows that the iNES was perceived to be beneficial for learning electronic health documentation. However, it was not perceived by students to be user-friendly due to lack of technological support as it was not developed web application by the local university.

The present SoTL project aims to develop a local simulated web application within UNIMAS, in collaboration with the Faculty of Information Technology and hosted by UNIMAS for students in the Faculty of Medicine and Health Science, UNIMAS. The project will involve phases of development which allow for (i) input of virtual patients' data and learners' interacting with the data; (ii) iterative process of analysing the data and deciding on given options, (iii) uploading of measurement data and (iv) formulating of care plan.

Plans of activities ongoing and to be carried out:

- A pre-survey of students' perceived ease of use, knowledge and awareness

related to electronic health records have been conducted before the development of the simulated web application to identify any relevant issues from the students' perspective.

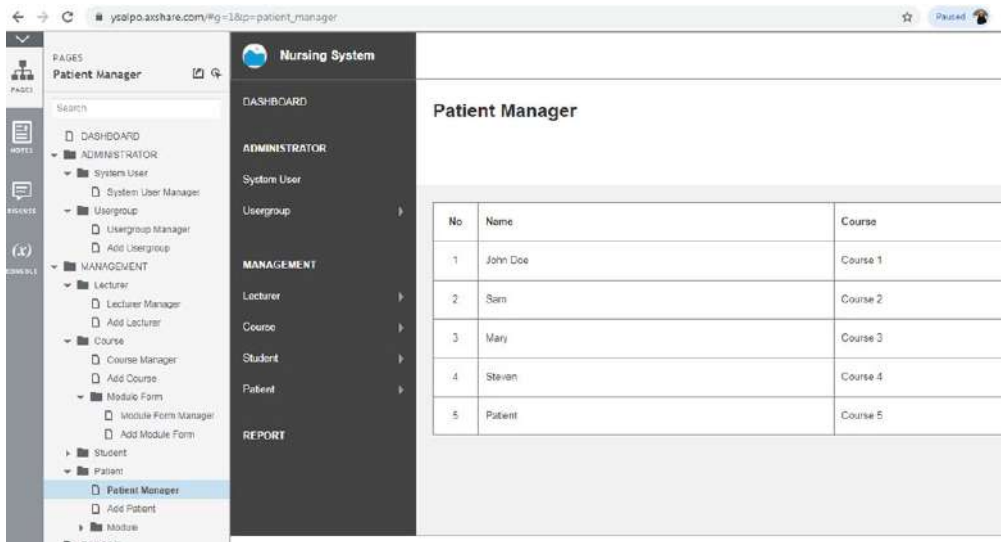
- Content validation will be performed within faculty in terms of the relevance once the programme developer has done the programming. The simulated, web application will be piloted in 4 of the nursing courses (Year 1-4) before the students' actual involvement. During the implementation, supports and facilitation to students will be given.
- Students' perceptions, knowledge, attitudes and Intention to use electronic health records will be surveyed after their exposure to the simulated electronic health record system. Their experience of using the simulated web application will also be explored.

The progress so far:

- The initial name of the system as the 'Nursing System' could be accessed at the URL: <https://yselpo.axshare.com/#g=1&p=d> ashboard (Figure 1 Nursing System). It has the features of 'Administrator (for system user, user group), Management (for lecturer, course, student, and patient) and Report.
- Further input of content in term of various health related assessment formats, clinical measurement charts, virtual patient data/ case scenarios, laboratory investigation results, common medications would be gradually be done by the programmer.

- Updating and improvement of the system will be on going, with the aim to
- complete the programming for piloting in December 2019.
- Piloting with students and refining of the system after development of application (in semester 2, academic session 2019/2020);
- Implementation , providing supports, facilitation to nursing students (1st week of April, Semester 2).

Figure 1: Nursing System



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THE EFFECTS OF MATHEMATICS ANXIETY TOWARDS STUDENTS' BEHAVIOUR AND PERFORMANCE IN PRE-UNIVERSITY STUDIES

by Emmerline Shelda Siaw, George Tan Geok Shim, Farah Liyana Azizan, and Norhunaini Mohd Shaipullah



Introduction

It is normal for students to treat mathematics as a difficult subject and this causes students to avoid solving problems that involve counting and numbers (Ashcraft, 2002). The on-edge sentiment one experiences when dealing with numerical issue is called mathematics anxiety. Mathematics anxiety appears to be seen in students at schools at all levels and unfortunately it keeps on expanding as school years advance (Yurtcu & Dogan, 2003). Hence, it is logical to say that mathematics anxiety can be increased once students enter pre-university studies. As mathematics is one of the core subjects for all programmes in pre-university, the level of Mathematics anxiety can be a good predictor of students' performance in their academics (Venkatesh & Karimi, 2010). This study focuses on discovering the mathematics anxiety level through questionnaires, interviews and studying its effects on students learning behaviour in pre-university studies. A study of mathematics anxiety and its impacts towards students' conduct can give an understanding of the most proficient method to decrease mathematics anxiety and subsequently influence the class to reduce anxiety in managing mathematical problems.

Methodology

A total of 545 pre-university students from two different groups, which are Life Sciences (LS) and Physical Sciences (PS) participated in the study. This research project used quantitative approaches to analyse the data. For the quantitative approach, an online survey was used to elicit students' responses. There are two parts to the questionnaire. The first part of the questionnaire used in this study is adapted from the Mathematics Anxiety Scale – UK (MAS-UK), which consists of 23 items. The newly devised MAS – UK includes a series of statements concerning situations involving mathematics developed by Hunt, Carter, and Sheffield (2011). For each statement, participants were required to

respond by indicating how anxious they would feel on a 5 – point Likert – type scale, ranging from *not at all* to *very much*. The second part of the questionnaire focuses on the students' behaviours inside and outside of the mathematics classroom. 10 statements are chosen to indicate how the students behave when they feel anxious while learning mathematics. These items were designed to reflect students' behaviour when dealing with mathematics from a local pre-university population. 5 – point Likert scale was also used to interpret the responses. Table 1 shows the scale used to respond to their behaviours. The Cronbach's alpha value for this scale is 0.875, indicating a high level of internal consistency.

Table 1: 5 – point Likert scale that was used for interpreting the responses on the students' behaviours

Scale	Descriptions
1.00	Never
2.00	Seldom
3.00	Sometimes
4.00	Often
5.00	Usually

Lastly, students' final examination results on mathematics courses were collected at the end of the semester to analyse the relationship between mathematics anxiety and the students' performance in mathematics.

Results & Findings

Table 2: Mean and Standard Deviation of the students' anxiety based on programme

	Programme	N	Mean	Std. Deviation	Std. Error Mean
Anxiety	Life	296	2.86	0.728	0.042
	Physical	249	2.80	0.695	0.044

Table 2 shows the mean of mathematics anxiety for the LS programme was 2.86 while for PS programme was 2.80. Hence, PS students had slightly lower mathematic anxiety compared to LS students. However, both programmes showed that the level of mathematics anxiety in pre-university was almost average, with the mean of 2.83.

Table 3: Independent t-test comparing anxiety based on programme

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Anxiety	Equal variances assumed	0.145	0.703	0.999	543	0.318	0.061	0.061	-0.059	0.182
	Equal variances not assumed			1.003	534.190	0.316	0.061	0.061	-0.059	0.181

A t-test was conducted to compare mathematics anxiety based on programmes. Table 3 shows there was no significance difference between LS and PS students as p was 0.703, which is greater than 0.005.

Table 4: Items on Behaviour

No	Item	Mean	Standard Deviation
1.	I watch online videos related to Mathematics.	3.018	1.213
2.	I use an application to help me solve Mathematics solution such as Wolfram.	2.554	1.277
3.	My family members help me to solve Mathematics questions at home.	2.176	1.104
4.	I really need extra classes for Mathematics subject.	3.222	1.163
5.	I hope the lecturer would give me more exercises outside of classroom.	3.422	1.132
6.	I prefer a smaller Mathematics class.	3.749	1.118
7.	I cannot relate the application of Mathematics in other subjects such as Chemistry, Biology and Physics.	2.516	1.049
8.	I do not like my Mathematics class.	1.917	0.952
9.	I feel anxious when my friends get better results in Mathematics.	3.644	1.189
10.	I try to find all the solutions on tutorial questions before the discussion in class happens.	3.794	1.006

Table 4 shows the mean and the standard deviation of ten items on students' behaviour when studying mathematics. The highest mean was 3.794, which is for item 10, followed by item six with the mean of 3.749, and third highest was item nine with the mean of 3.644. The lowest mean score was for item eight, with the mean of 1.917.

Table 5: The mean and standard deviation of students' anxiety level and students' performance in the final examination

	Mean	Std. Deviation	N
Anxiety	2.83	0.713	545
Final Examination	4.39	2.209	545

Table 6: Pearson correlation results between students' anxiety level and students' performance in the final examination

		Anxiety	Final Examination
Anxiety	Pearson Correlation	1	0.134**
	Sig. (2-tailed)		0.002
	N	545	545
Final Examination	Pearson Correlation	0.134**	1
	Sig. (2-tailed)	0.002	
	N	545	545

** . Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows the mean, standard deviation and Pearson correlation between the students' anxiety level and students' performance in the final examination. Based on the table, it shows that there was a positive weak correlation between students' anxiety level (Mean = 2.83, SD = 0.713) and the students' performance in final examination (Mean = 4.39, SD = 2.209), with $r = 0.134$, $p \leq 0.005$, $N = 545$.

Conclusion

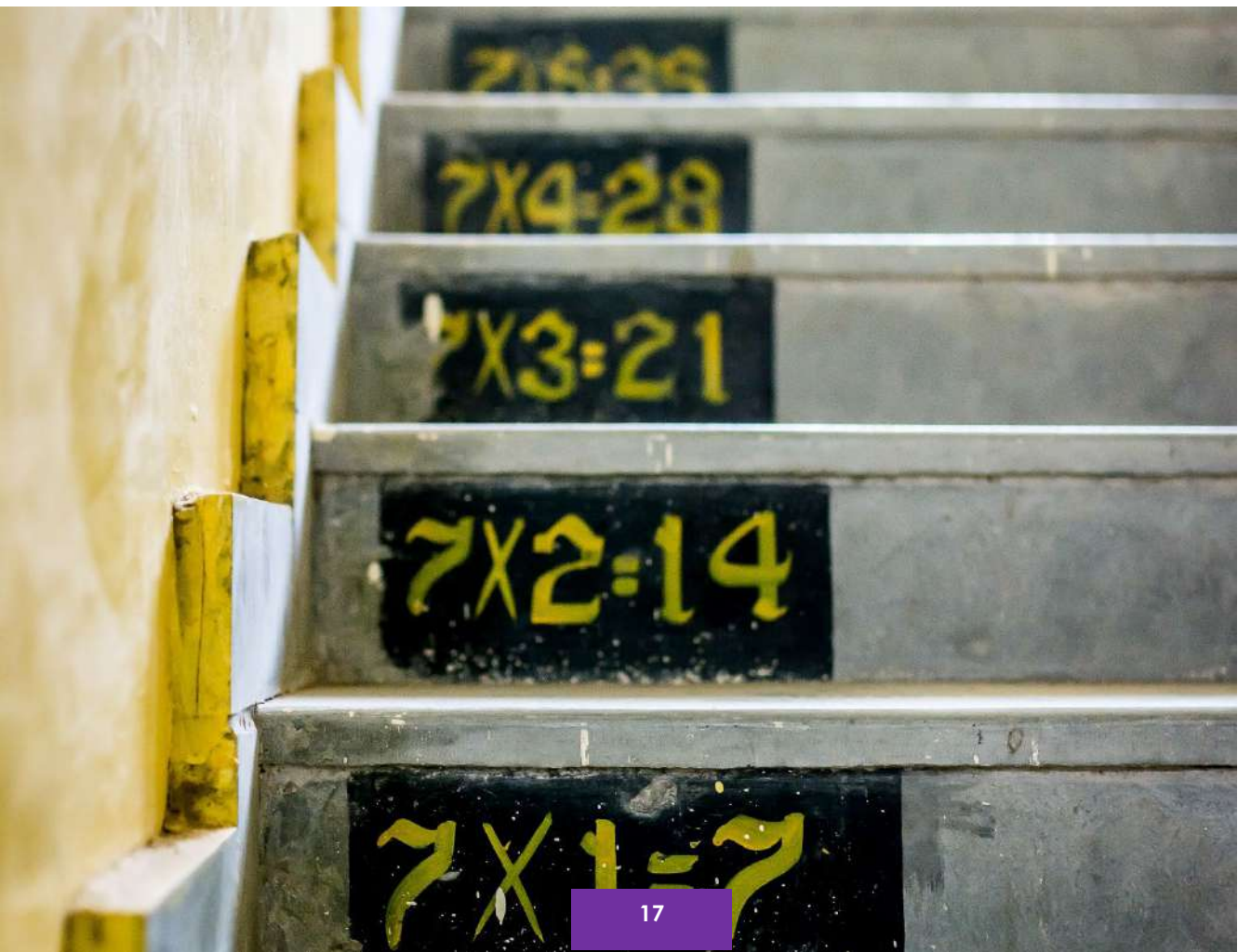
It can be concluded that mathematics anxiety is almost average among pre-university students. There is also no significant difference in mathematics anxiety between LS and PS students. Most respondents dealt with mathematics anxiety by doing exercises prior to their mathematics classes. Students would try to come up with the solutions by themselves or discuss with their friends in order to decrease their mathematics anxiety. The least thing that they would do is to dislike mathematics class. Finally, there is a positive weak correlation between students' anxiety level and the students' performance in final examination.

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INTRODUCTION

This project investigates the collaborative learning among students from different faculties in UNIMAS. We examined two courses:

- TMT2703 User Interface and User Experience Design
- TMU1043 Multimedia Technology

TASK FOR STUDENTS

Their tasks are to collaboratively design, develop and test board games based on the primary school syllabus. Prior to the design phase, they have to form a team. Each team consists of a maximum of ten members from different faculties. During the design phase, they have to discuss and debate their ideas among team members before they present it. Then, their classmates give comments during the presentation. All inputs for improvement are noted. Then, they have to build the first prototype draft of their board game. Subsequently, they test it among their team members to find any flaw and do necessary revisions. After that, the new version of the prototype is ready to be tested by their classmates. The final product of the board game is then tested in schools.



COLLABORATIVE LEARNING AMONG STUDENTS FROM DIFFERENT FACULTIES

A Case Study of UI/UX Design and Multimedia Technology Courses at FCSIT, UNIMAS

Jonathan Sidi, Syahrul N. Junaini, Jacey L. Minoi & Edwin Mit
Faculty of Computer Science & Information Technology, UNIMAS



VITAL STATISTICS

This course encourage me to learn by doing (hand-on/ practical)



Collaborative learning is a situation in which two or more people learn or attempt to learn something together. This course encourage collaborative learning.



WHAT I LIKE MOST ABOUT THIS COURSE?

“

"The course can enhance our creativity and critical thinking while doing the project."

”

CONCLUSION

This project shows that a real case project such as board game based on primary school syllabus can trigger and enhance students' collaboration in learning as it allows them to work as a team to derive a viable solution for an authentic problem.

This project was funded under Scholarship of Teaching and Learning (SOTL) grant no: SoTL/FSKTM/2018(1)/016

THE GIS AND SOCIAL SCIENCES: INTEGRATING GIS FOR THE DEVELOPMENT STUDIES PROGRAMME

by Farah Zaini, Adibah Yusuf, Haslina Hashim, Regina Garai Abdullah, Sifi Khatijah Zamhari, Kiky Kirina Abdillah, Nurhafizah Abdul Halim Yun

INTEGRATING GIS APPLICATION IN SOCIAL SCIENCES FIELD

The Development Planning and Management programme in Faculty of Social Sciences and Humanities, UNIMAS has taken one step ahead by introducing Geographical Information System (GIS) for final-year undergraduate students. The purpose is to equip students with GIS technology knowledge and its application in the social science field. Even though there are many applications of GIS in the social science field, students in this programme face difficulties in integrating GIS to their field of study.

Learning theories in class is less impactful if students do not have the ability to put them into practical use. Thus, there are many ways to investigate students' learning and performance, and one of the ways is through the integration between courses.

The GIS allows for the integration and comparison of contextual data from social as well as environmental or physical standpoints. Researchers need to identify where the differences, similarities, correlations, and interactions exist. GIS can accommodate both qualitative and quantitative variables into a study. GIS can do visualization, pattern analysis, spatial relationship, and others.

FIELD-WORK EXPERIENCE FOR SOCIAL STUDIES AND GIS

To enable GIS integration into Social Sciences, a field trip to Sebuyau, a small coastal town in Sarawak, had been organised for the students. Through this field trip, students were exposed to Social and Environmental Impact Assessment as well as community mapping. For the hands-on experience, students were introduced to the handheld Global Positioning System (GPS) which assists them in locating attractions and facilities at Sebuyau. Both data from SEIA and GPS will be

used during the hands-on practical session in the GIS lab. Even though the data are not enough for a real map to be produced, students were exposed to real-life data collection experience. The data were then converted to digital data by using ArcGIS 9.3 and Imagery base map. The main output of this fieldwork is a map of facilities in Sebuyau.

METHODOLOGY

The aim of this article is to examine how GIS education and Social Sciences can be integrated by focusing on the output from the field work experience. The qualitative research design was used to obtain insights from this study. Content analysis and thematic analysis were applied to get a clearer picture of how the knowledge of GIS and Social Science help in students' performance. The GIS output was also analysed to look at students' performance in visualizing the collected data. A total of all 30 students from Group 2 of GIS were involved as respondents in this study.

RESULTS AND DISCUSSION

Perspectives of Undergraduate Students for GIS-integration in Social Sciences

All respondents were asked to provide a reflection on their perspective of GIS integration in Social Science based on their experience during the field trip. Hence, the results are based on students' point of view on what their thought of GIS. Figure 1 shows the result of thematic analysis. Five main themes were derived based on the saturation points which are mapping, analysis, visualization, management and planning for site selection. Figure 2 shows the percentage of respondents' perspectives based on the theme. The highest response theme is mapping and the lowest are both management and planning for site selection.

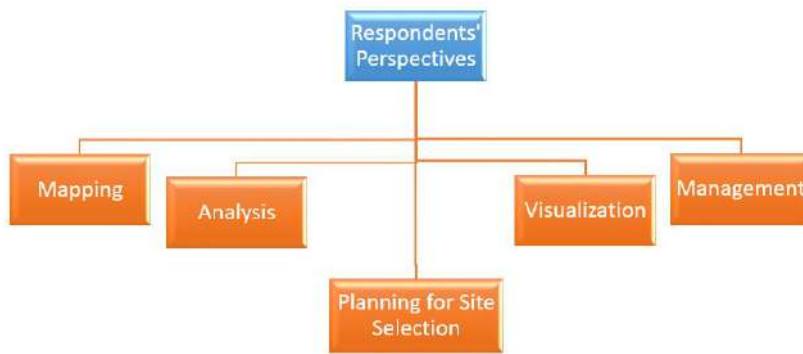


Figure 1. Thematic Analysis on Undergraduate Students' Perspectives of GIS-integration into Social Sciences

Percentage of Respondents' Perspectives

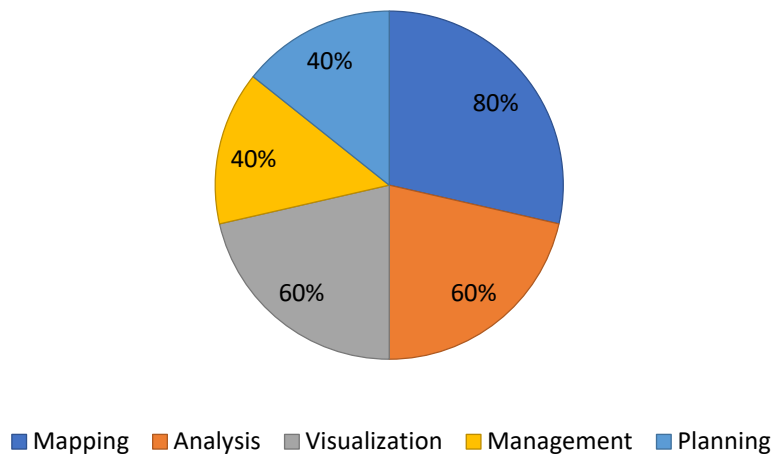


Figure 2. Percentage of Respondents' Perspectives based on Theme

The first main theme that reached the saturation point is Mapping with 80%. This is expected because one of the objectives for the field trip is to produce a map. Therefore, the majority of respondents have prior knowledge that GIS will help in the mapping process. Moreover, the GPS practical on site and the utilization of the GPS waypoint taken during the digitization in ArcGIS expose the students on the function of GIS in the social sciences field.

The second theme is Analysis with 60%. Similar to Mapping, respondents have prior knowledge

about one of the basic functions of GIS, which is to analyse data. However, they only have the rough idea of analysis, not in detail. The respondents did not state in detail what and how the analysis will be done using GIS. Similar to Analysis theme with 60% (18 respondents), visualization is also the basic function of GIS, which the respondents are familiar with.

The percentage of response for both Management and Planning theme is 40%. Based on the data, another 18 respondents only discussed the basic function of GIS, not its

The reason for differences in the map is due to human error. The respondents were amateur, and this is their first experience in map digitisation and using ArcGIS software. There were missing spatial data as well as lack of data attribute and accuracy in the map. Within a limited data, respondents were asked to do the buffer geo-processing. Figure 5 shows the result of buffer analysis of facilities nearby the residential area. From the figure, it can be observed that the buffer created is not accurate. However, the respondents have gained basic knowledge on the function of buffer geo-processing in ArcGIS.

Based from analyses, it shows that the aim to introduce basic of GIS to social sciences respondents was achieved. However, their perception on how GIS works in the real world is still ambiguous and they face difficulties to relate the application of GIS in the social sciences field.

Their views are limited to GIS application that was shown explicitly via this field trip.

CONCLUSION

As a conclusion, even though the field of social sciences is more toward political studies, social development, economic development, social work, anthropology and others, it should be integrated with GIS. The spatially-enabled function of GIS will help to highlight the output visually. Maximizing technology integration via GIS will create an interdisciplinary field and reduce the gap between one another. Therefore, it is essential to promote GIS in this field to enhance the research development, not only on the system itself but also the function as a whole.



Figure 5. Buffer Analysis on the Sebuyau Map

Acknowledgement

This work is supported by UNIMAS Scholarship of Teaching and Learning (SoTL) Grant through SoTL/FSSK/2018(1)/012. The authors would like to thank Universiti Malaysia Sarawak for supporting this work.

SELF-DIRECTED QUESTION FORMATION: ENHANCING STUDENTS' MEANINGFUL LEARNING AND PERFORMANCE

by Ashley Edward Roy Soosay and Md Mizanur Rahman

Introduction

We live in a world of technological marvel characterised by advancement in arts, science and technical achievement which obsolescence is part of it. Therefore, the acquisition of learning strategies to amass this ever-changing wealth of knowledge is required by people throughout their life. There are evidences that show the self-regulation of cognitive and affective states nurtures the impetus for lifelong learning. Student centred learning (SCL) encourages lifelong learning. Self-directed learning is an important aspect of student-centred learning. The medical programme curriculum at UNIMAS is SCL oriented. Empowering students with independent learning ability is the goal that every curriculum aims to achieve but it is a fact that assessment drives learning. This study seeks the importance of empowering students with the capability of self-directed question formation (SDQF). SDQF is a learning strategy method whereby students are taught about two cardinal assessment modalities in the UNIMAS medical programme. They will use this skill to generate their own questions from study material. In SCL, students can be encouraged to learn by creating their own tests and correcting their own work (Lancaster, 2017).

Problem Statement

The UNIMAS medical programme has many modalities of assessment. In this study we are interested in two of these modalities: Multiple-Choice Question (MCQ) (True/False) (MCQ(T/F)) and Best Answer Question (BAQ). As an educator we know for a fact, the difficulty of producing a good multiple-choice question (MCQ(T/F)) and best answer question (BAQ). The MCQ(T/F) modality is one of the toughest exam components. This modality together with BAQ, OSPE and MEQ, make-up the End of Block (EOB) exam in the medical curriculum. There are many failures in MCQ(T/F) component in every EOB. The essence of

making good question is the ability to comprehend the subject matter and the ability to integrate the knowledge. Personally, in order to form a good question, one has to 'digest' the content of the subject matter. Therefore, by giving SDQF task to the students, they are forced to generate good questions. Assessment for learning can be formed in a bite-sized assessment (Tan, K. H., 2017).

We believe during the process of generating good questions, students will revise and have a better understanding of the teaching and learning material. Thus, we postulate that the SDQF process can enhance the learning experience of the students and eventually increase their performance during exam. Assessment can be used to help learners to learn on a continuous sustainable way (Su, 2015).

Research Objectives

This study is to investigate students' learning experience on the use of self-directed question formation (SDQF) method compared to the traditional method of teaching and learning and to measure the effect of SDQF on students' performance in the subject matter.

Methodology

Description of the Methodology (Research Design)

The present study adopts a mixed-method approach in its research design. Such research approach is used to produce more complete knowledge necessary to inform theory and practice (Johnson & Onwuegbuzie, 2004). Both quantitative data and qualitative data will be used for the purpose of this study. In particular, the study will obtain feedback from students through questionnaire and focus-group interview on the learning experience using SDQF method. In addition, students' score in a test on the topics covered with and without SDQF will be analysed to gauge the level of understanding of the topics in concern.

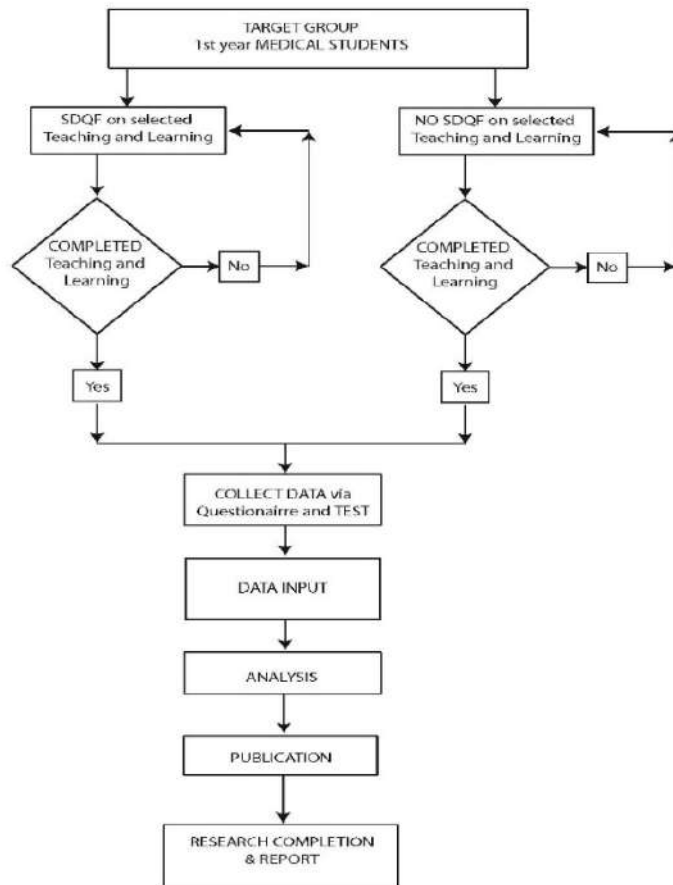


Figure 1: The adjacent flow chart depicts the research activities for this study.

Sample

The study involves 1st year medical students at UNIMAS, about 150 students and also 134 2nd year medical students for ranking the topics of interest. A questionnaire with 5-point Likert scale of not more than 20-items will be administered to gauge the perception of using SDQF on students' learning experience of the subject matter. The semi-structured focus group interview will involve 20% of the sample for the questionnaire. The purpose of the interview is to elicit detailed information on the responses given in the questionnaire.

Data Collection Procedures

The data will be collected primarily through the use of questionnaire. The questionnaire will be made using standard perception

questionnaires for assessment methods. It will undergo pilot testing before being used as the research instrument. The questionnaire will be distributed to the target groups and the completed ones will be used for analysis. The focus group interviews will also be conducted according to the convenient time set with the respondents. The interview sessions will be recorded and used to further gauge their views on the concept of using SDQF method and how it has enhanced their learning process.

Data Analysis Procedures

The data from the questionnaire will be analysed using both descriptive and inferential statistics. As for the qualitative data from the interviews, the sessions will be transcribed and analysed based on emerging themes.

Results

Ten topics of interest were identified. These ten topics are ranked based on difficulty by 2nd year medical students. Table 1 shows the results of the survey done with year 2 medical students. The ten topics are grouped into two groups of 5 topics each (equally by difficulty), Group A and Group B. Table 2 shows the grouping results. For

one of the students has generated questions with answers for the five teaching and learning activities using SDQF method for the two modalities. As for the other five topics, students did not generate SDQF materials. At the end of the experiment, students will be subjected to a short test for Group A and B teaching and learning material.

Table 1: Ten topics of interest with their respective difficulty score based on 2nd year students' perspective.

Lecture Topics	Score
Topic B: Introduction to Cell Biology	3.31
Topic A: Cytoplasm & Organelle	3.47
Topic C: Cell-Cell Interaction	4.82
Topic D: Chromosomal Anomalies	5.28
Topic G: Introduction to Cancer	6.03
Topic E: Apoptosis	6.25
Topic H: Membrane Diseases	6.42
Topic J: Molecules of Heredity	6.65
Topic F: DNA Mutation & Repair	6.66
Topic I: Genetic Variation	6.90

Table 2. Grouping of test and control groups of teaching and learning material.

Group A (test)		Group B (control)	
Lecture Topics	Score	Lecture Topics	Score
Topic B: Introduction to Cell Biology	3.31	Topic A: Cytoplasm & Organelle	3.47
Topic C: Cell-Cell Interaction	4.82	Topic D: Chromosomal Anomalies	5.28
Topic G: Introduction to Cancer	6.03	Topic E: Apoptosis	6.25
Topic H: Membrane Diseases	6.42	Topic J: Molecules of Heredity	6.65
Topic F: DNA Mutation & Repair	6.66	Topic I: Genetic Variation	6.90

Discussion & Conclusion

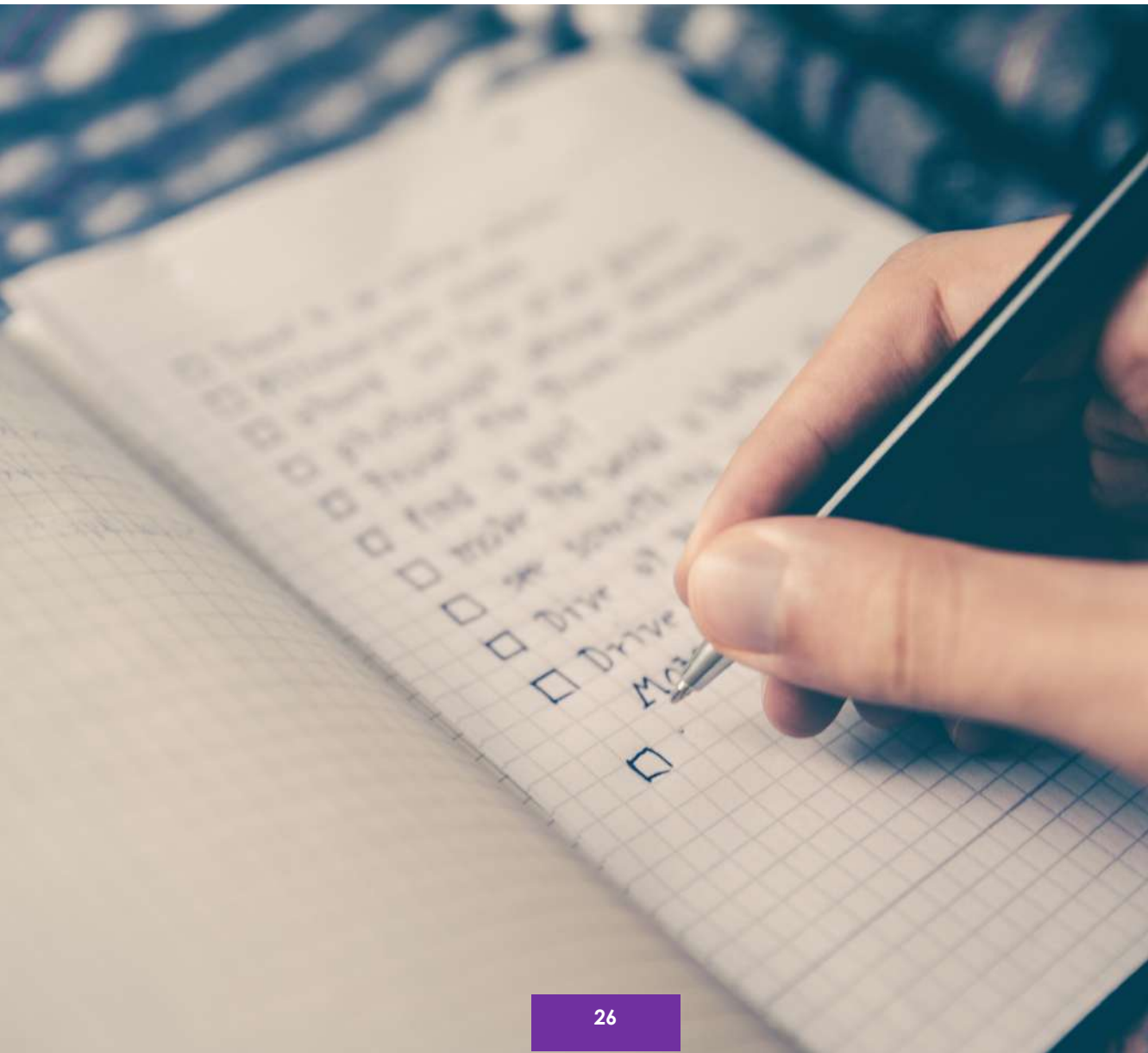
Through the introduction of SDQF method to 1st year medical students at UNIMAS, we believe that this study will be able to enhance the learning experience and increase academic excellence. This study will also discover new strategy to overcome high failure rate in one of the assessment components of End of Block Exam in the medical curriculum.

Acknowledgement

This work is supported by UNIMAS Scholarship of Teaching and Learning (SoTL) Grant through SoTL/FPSK/2018(1)/019. The authors would like to thank Universiti Malaysia Sarawak for supporting this work.

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BOARD GAME IN THE LEARNING OF ACADEMIC ENGLISH WRITING

by Joseph Ramanair, Souba Rethinasamy, Damien Mikeng, Ashley Edward Roy Soosay, Jecky Misieng,

Background

Making connections between learning and teaching in the classroom is crucial as it empowers learners to realise the purpose of education as a whole. It enables learners to put their learning into perspective, stimulate them to master the required skills and knowledge in a thoughtful manner, and encourages them to interact, collaborate and cooperate so as to learn from one another. Classroom teaching approaches thus, need to facilitate learners to learn by helping them to make connections in their learning. Making such connections is also important in an increasingly interconnected world of the 21st century particularly as the future of learning as envisioned in Education 4.0, is built around shared knowledge and aspiration (Fisk, 2017).

Literature Review

One approach in connecting classroom language learners in particular is through the use of board games. The use of board games in the English-as-a-second language (ESL) classroom offers much potential in enhancing the language learning experience. It not only makes learning enjoyable through play but also encourages interaction and supports learners to recall important salient learning points. Through the playing of board games, learners are supported to adapt to reality, and solve problems which are otherwise difficult to be tackled, in a collaborative manner with the help of others and unconsciously (Bettleheim, 1987; Hughes, 2009; Vygotsky, 1978). Further, the use of board games enhances learning as it empowers learners to jointly construct their social experiences and become active agents of their own learning (Rama, Black, van Es, & Warschauer 2012; York & deHaan, 2018). Using board games also enables language learners to learn through tasks. a learning activity is considered a task when it emphasises meaning-focused language use, provides a gap, requires

learners to depend on their own resources to complete it, and presents a clearly defined outcome or goal to ensure that learners use language as a means for achievement (Ellis, 2003; Long 2014). The potential that board games offer to the ESL scenario thus supports socio constructivist learning principles and fulfil criteria for task-based learning.

Problem Statement

However, despite the potential that board games offer to language learning, research into its use is still lacking. While there are research studies investigating the use of board games in the language classroom, these are largely digital based (York & deHaan, 2018). York and deHaan (2018) observed that studies investigating the effect of table-top non-digital board games which is the focus of this research remain underexplored. While digital-based games offer learners an interactive attractive animated multimedia based environment that can promote language learning (Felicia, 2011), these types of games are limited in promoting face-to-face learner socialization and interaction that are crucial to the learning process as afforded by table-top non-digital board games (Kovačević & Opić, 2013; Lean, Illingworth, & Wake, 2018). Further, studies that investigate digital-based board games tend to largely focus on the context of high school ESL learners (Benoit, 2017; Cook, Gremo, & Morgan, 2017), low-proficiency ESL learners (Fung & Min, 2016; Sevy-Biloon, 2016; York & deHaan, 2018), and in enhancing oral skills and vocabulary development (Al-Bulushi & Al-Issa, 2017; Fung & Min, 2016). There is, therefore, a dearth in the board game research literature investigating undergraduates' reactions to using table-top non-digital board games and its effect on their learning of academic English writing.

AIM OF THE RESEARCH

The main aim of this research is to explore students' reactions to using a specially designed table-top non-digital board game and its effect on their learning of academic English writing.

RESEARCH OBJECTIVES

The objectives of this research are as follows:

1. To investigate students' reactions to the use of board game in the learning of academic English writing.
2. To determine the effect of the use of board game on students' understanding of the organisation, structure and language features of academic English writing.
3. To determine the effect of the use of board game on students' performance in academic English writing.

Methodology

This proposed study will involve both quantitative and qualitative approaches. Data collection will consist of a questionnaire, two tests (pre and post), group interviews, and scores of written essays. The participants for this study will involve students who have registered for the Academic English 2 course which is offered every semester at UNIMAS. A total of 200 students will be involved as participants in this study. Data will be collected during the learning of the writing genre in the Academic English 2 module, and for the duration of two academic semesters. Data from the

questionnaire, tests, and writing scores will be analysed using descriptive statistics while the interview data will be thematically analysed.

All students will participate in playing a specially designed table-top non-digital board game. Participants will be grouped into two main teams (3 persons per team) to compete against each other. Each team will be assigned the board game, instructions to play the game, task cards, six counters, two dice, and a score sheet to play the board game. This board game will consist of numbered spaces for the participants to move their counters. These spaces also state the instructions they need to follow at particular points in the game. Participants will also need to pick a task card that will require them to answer a question, give an opinion, or discuss. The instructions and tasks will cover aspects related to the organisation, structure and language features of academic English writing.

Currently a prototype of the tabletop board game is being designed and finalised. Data collection will commence in 2020.

Acknowledgement

This work is supported by UNIMAS Scholarship of Teaching and Learning (SoTL) Grant through SoTL/FBK/2018(1)/021. The authors would like to thank Universiti Malaysia Sarawak for supporting this work.

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“

That's what games are, in the end. Fun is just another word for learning.

– Raph Koster

Game designer, Creative Director and the author of *A Theory of Fun for Game Design*

The Effects of Design-Based Learning in Teaching Augmented Reality for Pre-University Students

IN THE ICT COMPETENCY COURSE

Ahmad Alif Kamal, Syahrul Nizam Junaini & Sinarwati Mohamad Suhaili
Centre for Pre-University Studies
Universiti Malaysia Sarawak

Mini lecture session ->
Post-test 1 ->
Needs analysis

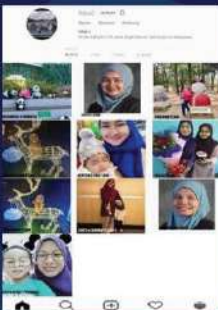
Design and development of AR learning materials

Instructional Materials Motivational Survey (IMMS)

PHASE 1
PLANNING

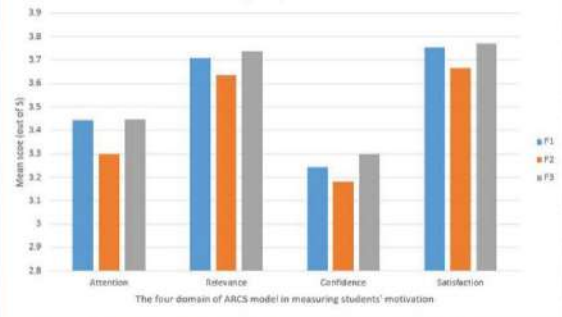
PHASE 2
IMPLEMENTATION

PHASE 3
EVALUATION

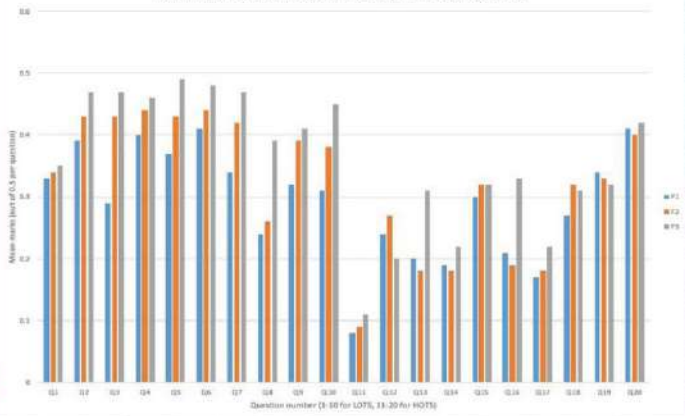


DESIGN-BASED LEARNING

Instructional Materials Motivational Survey (IMMS) on The Students of Groups F1, F2 and F3



Mean Marks Per Question for Students of F1, F2 and F3 for Post-Test 2



Acknowledgement

This work is supported by UNIMAS Scholarship of Teaching and Learning (SoTL) Grant through SoTL/PPPU/ 2018(1)/002.



AUTHENTIC ASSESSMENT

Using 21st Century Skills in Engaging Students' Participation

INTRODUCTION

This research will distinguish the students' and lecturers' perception of what make "performance-based" or authentic assessment more engaging than the conventional assessment to make the higher education more interactive. Examples of Authentic Assessments for this research:

1 Demonstrate Use of Knowledge

Students are exposed through discussion, video screening and lectures

2 Group Brainstorming

All activities are conducted through collaborative tasks-driven

3 Presentation

Presentations are encouraged during the course especially when presenting the findings of each tasks given

OBJECTIVE

Assess the students' 4C skills in presenting ideas and problem solving when given real world problems through their tasks/projects given.

COMMUNICATION

CREATIVITY

COLLABORATION

CRITICAL THINKING



METHODOLOGY



Survey Questionnaire were distributed through eLEAP to students.

RESULTS

Most Preferred Assessment



Online Quizzes

4.23



Problem Solving Activities

4.029



Group Project

4.01

DEMOGRAPHICS

Involving 104 students from Year 1 Design Technology Programme during Program Core GKL1263 Visual Studies for Designers course.



40%

60%



STPM	78%
PRE-U	6%
DIPLOMA	13%
OTHERS	3%

RESULTS

In-class Activities

- Visual note taking for a specific course attended
- Drawing a CTF 2 Route map using Mental Mapping
- 5 Pictures Story
- Visual Thinking Strategies using photojournalism image
- Drawing an Infographics of Health Facts
- Object Analysis based on the Object Analysis Guide
- Paper Cup Arts based on Visual Thinking

Mean

3.894

3.913

4.058

3.894

3.981

3.837

4.059

STUDENTS' FEEDBACK

"I enjoy the course and have fun during class. The activities that we have done requires us to think out of the box to solve the problem."

"Because lecturer using the method that make the study become less pressure more fun and it essay to understanding what lecturer want to teach us."

"A new approach to the education system which is more suitable for the 21st century"

SALMIAH ABDUL HAMID & MUSDI HJ. SHANAT

FACULTY OF APPLIED AND CREATIVE ARTS

SoTL/FSGK/2018(1)/005

GUIDED LEARNING TO IMPROVE SELF-DIRECTED LEARNING: A STUDY AMONG FIRST YEAR PSYCHOLOGY STUDENTS

By Ida Juliana Hutasuhut, Mohamad Azhari Abu Bakar and Kartini Abdul Ghani

Introduction

Many studies agreed that students in higher education institution, particularly in year one, still rely on teacher-centred learning (Du Toit-Brits, 2019). This phenomenon was also found, particularly among first year UNIMAS students. They tend to wait for lecturers to spoon-feed them as what they had experienced during their secondary education. In industrial revolution 4.0 where knowledge is everywhere, learning is much easier. However, learning depends on the students themselves. University students should sufficiently equip themselves with the learning skills which prepared them to be more independent and self-directed in their learning.

Objective of Study

General Objective:

To improve self-directed learning among first year students by providing guided learning.

Specific Objectives:

- to identify students' level of self-directed learning;
- to improve student's ability in understanding what to learn and how to learn; and
- to guide students on how to identify their preferred learning method.

Literature

Knowles definition of Self-Directed Learning (SDL) is "a process in which individuals take the initiative, with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18). Knowles (1975) urged that students should be active in their learning, able to adapt and learn how to learn in a new and fast-changing environment. However, according to Jossberger, Brand-Gruwel, Boshuizen and Van de Wiel (2010), students are not characteristically self-directed, and SDL is a

method that drives students to take initiative and think about the purpose of learning. There are some elements that need to be fostered to improve self-directedness among students, such as guiding them to identify what need to learn, set learning objectives, resolve problems and take responsibility for their own learning (Knowles, Holton & Swanson, 2012). In order to achieve self-directedness in learning, lecturers as learning facilitators need to function as scaffold for the students to have learning skills, know how to learn so that initiative to learn will improve. Furthermore, a conducive self-directed teaching environment fosters positive learning experience among students (Du Toit-Brits, 2015; Knowles et al., 2012) that can be created when the lecturer facilitates student's initiative for SDL, empowering students toward SDL, and create a cooperative learning environment (Du Toit-Brits, 2019).

Methodology

This study examines the self-directed learning skills among first year students of Psychology Programme UNIMAS, particularly the KMY1013 (Introduction to Psychology) class. This study was based on Constructivism as paradigm in teaching and learning which believes that students build their own understanding through experiencing things and reflecting on that experience.

This study created intervention in class with a number of different teaching practices to guide students to be active in class and being active in creating and reflecting knowledge and talk/show about what they do and how their new understanding was built. These different teaching practices function as scaffolding in improving students' self-directedness in learning.

The step-by-step procedures conducted are:

Pre-Test; Measuring the level of student's self-directed learning at the beginning of the semester by using Self-Directed Learning

Readiness Scale (SDLRS) developed by Guglielmino and Guglielmino (1977).

resources available at the university library (CAIS), such as interlibrary loan (ILL) service.

Implementation of Guided Learning in Class

Introducing the Topic - Understanding what to learn

In introducing each new topic, the lecturer explains the topic and the learning objectives briefly. After this session, the lecturer asks students to give their opinion and/or expectation about this topic individually or in pair. The lecturer encourages students to put forward related ideas without the fear of being wrong. This session is important for the lecturer to get information about students' prior knowledge and it is also good to encourage students to express their opinions freely. At the end of this session, the lecturer will summarise the students' ideas and link it back to the learning objectives. It will help students to be aware of "what to learn".

Learning - Guiding how to learn (to be more self-directed learner)

Introducing Learning Technique and Resources

During lectures, various teaching methods included lectures, case studies, video watching, mind-mapping, self-searching of information and problem solving in groups will be employed. The lecturer then helps to connect students' previous knowledge with the new knowledge through these methods. If there is an unfamiliar term or something interesting in the topic, the lecturer will ask students to search related information through the internet by using their smartphone on the spot. In several occasions, the lecturer can also show how to find good learning sources from various resources such as journals, websites, e-books, YouTube videos and so on. The lecturer also encourages students to utilise learning

Incorporating Peer Learning in Class

The lecturer encourages students to learn from each other and teach other students to learn new material or produce new knowledge together. Learning from peers or teaching peers has several advantages such as the learning will be more engaging, easier to understand and retain information longer. After one sub learning unit finishes, the lecturer provides a topic to be discussed in a small group (four to five students) in 15-minutes. Then, each group uploads the result in the e-learning platform (eLEAP) or presents it in front of the class so that everyone can learn from each other. These learning activities will provide opportunities for students to learn how their peers search for information, process and express it verbally or nonverbally.

Cultivating Knowledge Sharing

In class, the lecturer provides ample space and time for the students to share relevant knowledge by showing how it was obtained and what are the knowledge obtained. Appreciation such as verbal praises or giving bonus marks is also used as part of the intended means to reinforce and cultivate knowledge sharing among students.

Post-Test; Measuring the level of student's self-directed learning by using Self-Directed Learning Readiness Scale (SDLRS) by Guglielmino and Guglielmino (1977).

Findings

The total number of students participated in this study was thirty-eight (38). Twelve (12) students were classified as below-average, twenty-four (24) students as average and two (2) students as above-average.

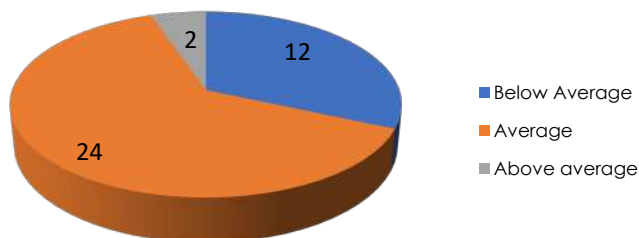


Figure 1: Number of students based on the SDLRS score classification.

The table below summarises the implementation of guided learning in class:

WEEK	Learning Unit	Guided Learning Practices
1	Public Holiday	-
2	Public Holiday	-
3	LU-1 Introduction to Psychology	Introductory to the Topic - Understanding what to learn - Lecturing - Video Clip - What Psychologist Do - Online Searching using smart phone - <i>What Psychologists Do</i>
4	LU-2 Scientific Method in Psychology	Introductory to the Topic - Understanding what to learn - Lecturing - Movie - The Stanford Prison Experiment - Online Searching about various research methods
5	LU-3 Biological Psychology LU-4 Sensation and Perception	Introductory to the Topic - Understanding what to learn - Lecturing - Video Clip - Biological Psychology - Online Searching using smart phone
6	LU-5 Human Development	Introductory to the Topic - Understanding what to learn - Lecturing - Piaget Cognitive Development - Video Clip - Piaget Cognitive Development - Self-reflection
7	LU-5 Human Development	- Lecturing - Video Clip - Erik Erikson's Stages of Psychosocial Development - Group work - Discuss crisis in each of the stages - Self-reflection

The Implementation of guided learning in class will be continued until week 12 of the present semester and at the end of the class, a post-intervention test will be conducted to see whether the implementations of guided learning improves the SDLRS score.

Conclusion

Given that this study is still ongoing, no conclusive results can be reported yet. However, based on the lecturer's observations and verbal responses from students, they find that these guided learning activities in class contribute positively in cultivating necessary skills for information searching and deep learning.

Acknowledgments

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CULTIVATING RESEARCH SKILLS AMONG UNDERGRADUATES: A RESEARCH METHODOLOGY TOOLKIT

by **Nor Mazlina Ghazali, Shahren Ahmad Zaidi Adruce, Fitri Suraya Mohamad, Hasbee Usop, Abdul Halim Busari, Prashanth Talwar and Monica Simon**

INTRODUCTION

Research is an important activity in higher education. Students are required to conduct research at the end of their study to illustrate the capability to pursue academic inquiry in their field of study. Research methodology (KMF 2024) is a faculty core course for undergraduate students at the Faculty of Cognitive Sciences and Human Development. It provides them with the theories and practice to conduct systematic inquiry in their disciplinary fields. However, as pointed out by Kurtz, Sagee and Getz-Lengerman, (2003), students always feel worried and anxious with courses that are related to research such as Statistic and Research Methodology. These courses are more technical in nature and employ systematic and scientific approaches. Students have negative attitude towards such courses and have the tendency to lose interest of these courses (Berenhaum et al. as cited in Kurtz et al., 2003). To reduce uneasiness towards the Research Methodology course, mechanisms to improve the teaching and learning of this course has to be explored.

A toolkit has been developed in order to assist students to increase the understanding and interest in research methodology. The content of the toolkit is based on inquiry bases which describe each stage of a research process. In developing this toolkit, gamification approach has been chosen as the foundation. Through gamification, students will be encouraged to connect and engage with the content which sometimes can be too complicated for them to understand. Students will have the opportunity to learn and understand the content by playing the game. Answers will also be provided in the game in the form of a card. This transformative way of teaching research methodology focuses on advanced approaches to learning and teaching that support learners in the adoption of 21st century skills (Future Classroom Lab, 2019).

RESEARCH OBJECTIVES

The objectives of this research are:

- (i) to identify the gaps in comprehension which affect the conduct of small-scale research projects among the final year students;
- (ii) to develop a research methodology toolkit for students and lecturers; and
- (iii) to examine the effectiveness of the research methodology toolkit.

RESEARCH QUESTIONS

This paper focuses on the second research objectives. The comprehension gaps were identified from data that were collected from a survey earlier on. Survey results show that students still do not have adequate knowledge to develop good research topics, write good literature review, cite references, identify variables, frame problem statement, form research questions and identify data collection procedures.

TOOLKIT DEVELOPMENT PROCESS

Future Classroom Lab (2019) defines a toolkit as a collection of tools, guidance and resources for designing future classroom scenarios and it is used to bring advanced and innovative learning to the classroom. The toolkit helps the user to establish a path through the process of innovation.

Based on the comprehension gaps that were identified in the first research objective, a toolkit has been designed according to the following stages.

The **first stage** involved brainstorming on the content of the toolkit. The content was translated to inquiry form to trigger inquiry-based learning (Czujko & Moszyk, n.d). In this toolkit, questions are categorised based on the chapters in research report writing. The following table provides some sample questions for each chapter.

Chapter 1 Will the problem fill the gap that is highlighted in previous research? What is the conceptual framework for this research?
Chapter 2 Has the identified gap been examined by other researchers or professionals in the field? How would you relate the literature with your independent or dependent variable?
Chapter 3 What kind of research design that you plan to choose? How would you collect data?
Chapter 4 How do you present your findings? Have you discussed the findings and compared them to existing research studies?
Chapter 5 What is the main implication of your study? What are the limitations of your study? What are your suggestions for future work?


The **Second stage** focused on developing the question cards. The questions were transferred into cards of different themes to categorise them based on chapters. The cards help to structure discussion and organise the thoughts of those who take part in the learning via this toolkit.

The **Third stage** focused on developing the scoreboard. This scoreboard records the performance of each student in the form of a leader-board. A guide that describes the total scores obtained was also created.

The **Fourth stage** focused on constructing the game module. The game board describes the game rules and illustrates the game paths.



RANK	GROUP	SCORE
1		
2		
3		
4		
5		
6		
7		



Check your performance!

SCORE	DESCRIPTIONS
Below 20	Oh no! Please approach the game master for a chance to collect answered questions and marble cards.
20 - 30	You are doing good. You may approach the game master for a chance to collect ONE answered questions and a marble card.
30 - 40	You are doing good. Keep it up!
40 and up	Excellent and well done! You may proceed to the next level. Good luck!



CONCLUSION

As a conclusion, the first phase of this study has been completed with the development of a toolkit that consists of question cards, a scoreboard, a scoreboard guide and a board game. The construction of this toolkit is important to progress to the second phase, which is on the usability testing of the toolkit.

ACKNOWLEDGMENTS

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KNOWLEDGE, AWARENESS AND PRACTICE OF SELF-DIRECTED LEARNING AMONG YEAR 3 MEDICAL STUDENTS

By Myat San Yi, Khin Than Yee, Soe Lwin, Mardiana Kipli, Mi Mi Khaing & Thidar Soe



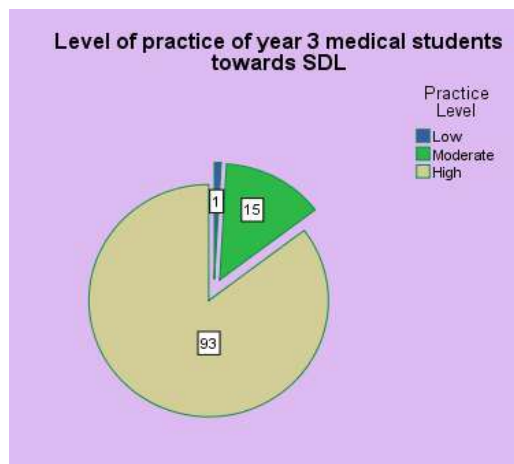
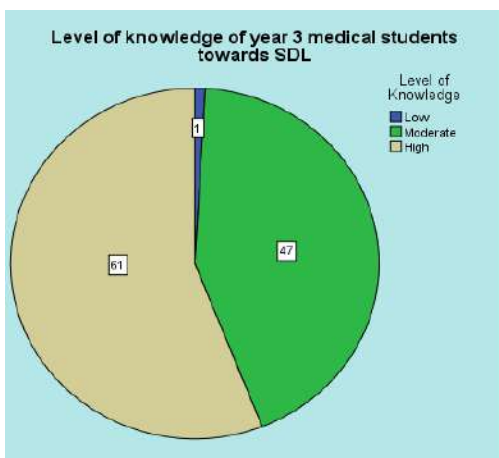
Self-directed Learning (SDL) has mostly been described as a learning process in which the key element is the learners' conscious acceptance of responsibility for learning. Therefore, it is the most powerful and active in its sense and there is a robust difference from the didactic lecture learning method. However, SDL in young learners who just happened to expose to a complex, dynamic and busy medical ward has not been sought yet. The objectives of our study are to assess the knowledge and awareness of SDL in year 3 medical students; to determine the practice of SDL in year 3 medical students in their learning process; and to improve the future teaching method in Obstetrics and Gynaecology posting with the new knowledge from this study. It was a cross-sectional descriptive study conducted from 17th September 2018 to 16th September 2019.

The target population is the year 3 medical students from UNIMAS. After validating the questionnaires with a pilot study, we conducted our study by distributing the questionnaires and obtained the answers at the same time to assess their understanding, concept and knowledge.

We took note of their comments at the end of the questionnaires and compiled them according to the theme. The data entry and compilation were analysed later with the assistance of Statistical Software (SPSS) version 22. The results were calculated and expressed in tables or graphs.

Simple descriptive statistics was applied, and the mean age of the study group was 21.89 years. The study population was 22% of male vs 78% of females. 55% of Malays involved in the study while 14.7% of Indians and 11.9% of Chinese were included in the study with 9.2% Bumiputras.

The knowledge scores were calculated based on the cumulative total of individual responses residing in that domain. The findings from the study revealed that 56% of the respondents had high knowledge and awareness of self-directed learning and 47% had moderate level of knowledge which was positive. Regarding the practice of self-directed learning, 85% of the students postulated that they applied fully the SDL steps during their posting which was the supportive finding to the curriculum of the university. 13.8% used moderately of the SDL practice which was acceptable to the facilitators as the weightage was not so high.



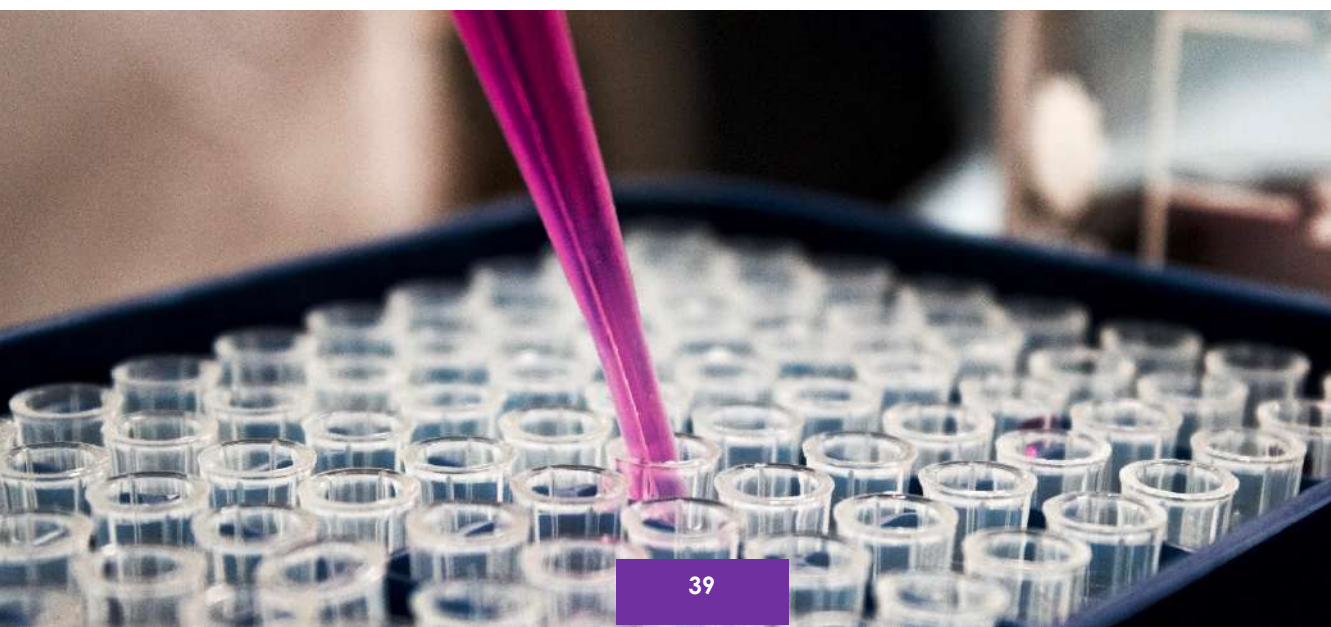
Students also responded that if the facilitator coached them in the learning process, they were more motivated and confident. It created the initiative to expand their learning in terms of contextual knowledge. The respondents agreed time management was allocated thoroughly if facilitators engaged more in SDL. The facilitators' help was welcomed to accomplish the evaluation process by the respondents in this study.

and engagement of facilitators in the learning process. The motivation made by the facilitators, improving the confidence level of learners and helping them in self-evaluation process play an important role in strengthening SDL practice. Barriers and outliers should be observed during the learning process as there were issues on learners' diversity which future research should explore.

SDL is a good method and it was adopted in a systemic manner in our university curriculum. The knowledge scores on SDL was lesser than practice scores in this study and it may be due to the possibility of the insufficient exposure in terms of SDL knowledge in their first clinical year. The practice of SDL was well-perceived by the participants and it may be due to the previous pre-clinical problem-based learning process

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ASSESSING STUDENT KNOWLEDGE LEVEL USING FUZZY MODELLING APPROACH AND VISUAL ANALYTICS

by Chee Siong Teh, Wen Thing Ng & Mohamad Hardyman Barawi

INTRODUCTION

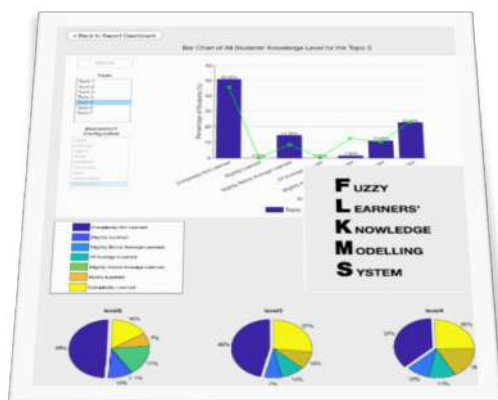
In the field of education, the emergence of technologies raises opportunities and challenges in personalising learning. However, due to the complexities of personalising learning, instructors who are knowledgeable in teaching and learning shy away from personalising learning.

This study presents a fuzzy learners' knowledge modelling system that can minimise the complexity of personalising learning via technology leverage, in order to encourage and assist instructors in personalising learning. To fulfil this objective, design and development of the proposed system revolves around three issues related to personalised learning.

How the proposed system can integrate with the present curriculum. The proposed system is designed to be able to decompose the instructors' knowledge based on the present curriculum. The proposed system is designed to record the learners' knowledge as a subset of the instructors' knowledge. Via such design, the proposed system is able to report the learners' knowledge for the present curriculum.

How to determine the learners' knowledge that is lexically imprecise. Instructors tend to determine the learners' knowledge based on their assessment results. However, determining what learners had learned is not as direct as measuring the number of correct answers that the learners performed in the assessments (Jeremić, Jovanović, & Gašević, 2012). The reasoning of learners' knowledge can be influenced by the imprecise factors too. For example, DEPTHS (Jeremić et al., 2012) involves the difficulty of answering the assessment questions as a factor in knowledge reasoning. Hence, a fuzzy inference system is embedded into the proposed system for reasoning the learners' knowledge. This is because fuzzy inference system can mathematically deal with

uncertainties (Asopa, Asopa, Joshi, & Mathur, 2016). This fuzzy inference system is designed to be able to capture learners' knowledge based on their assessment results and other imprecise factors, such as the difficulty level of answering the assessment questions that might influence the knowledge reasoning.



How to examine each and every learner's knowledge, especially in large classroom. This is due to the essence of understanding each individual learner's knowledge for planning appropriate interventions to personalise the learner's learning (Volarić, Vasić, & Brajković, 2017). However, such process is difficult and burdening to the instructors without technological help, especially with a huge group of learners. Learning analytics is an emerging technology for capturing, analysing, and reporting any data about the learners and the learning environment (Adams Becker et al., 2017; Suthers & Verbert, 2013). Hence, the learning analytics approach is utilised in the proposed system so that it is able to report the knowledge of either a group of learners or an individual learner.

METHODS

In order to demonstrate the applicability of the proposed system, a real-world case study was conducted in cooperation with an undergraduate instructor. During the semester where this case study was conducted, the instructor conducted lectures weekly. After several lectures, the instructors tested the learners' knowledge via online assessments. A benefit of conducting online assessments is that the learners' assessment results are immediately computed by the online tools right after they completed the assessments. This can reduce the instructors' workload in marking and grading all learners' assessment performance.

The required data for this case study was collected from the course instructor. After collecting the data, data pre-processing was conducted. For this case study, the data pre-processing began with tabulating the collected data and then checking for any missing values. Next, the collected data was exported in Comma-Separated values format for inputting purpose. Afterwards, the collected data was inputted to the proposed system (See step 1 in Figure 1).

Subsequently, the fuzzy inference system that was embedded in the proposed system reasoned the learners' knowledge based on the collected data. The learners' knowledge is categorised into seven states of knowledge level that represents the students' online learning performance. Then, the proposed system modelled and reported the fuzzily reasoned learners' knowledge based on the present curriculum. The reports of learners'

knowledge were generated via learning analytics approach and presented to the instructors in visualisation form (see step 2 in Figure 2). The purpose of presenting reports in visualisation form is to ease the interpretation and comprehensibility of the reports. Moreover, visualisations can enhance the meaningfulness of the reports to the instructor, whereby the instructor can have his or her own interpretation based on their teaching experiences and understanding about the course and the learners.

SYSTEM DESCRIPTION

The fuzzy inference system was developed to model and visualise learners' knowledge for online evaluation. The system takes the input of all questions and student results from online assessments and evaluated individual/group performance using fuzzy reasoning approaches. This system models and reports the fuzzily reasoned learners' knowledge based on the Bloom's taxonomy and levels of question difficulty (see Figure 3). The reports of learners' knowledge are generated via learning analytics approach and presented to the instructor in visual form.

The case study demonstrated how the proposed system can be an assistant to the instructor in a real-world scenario. It shows that the proposed system has capabilities of reasoning, modelling, and reporting the students' online learning performance based on the inputs provided by the instructors. Moreover, the proposed system is able to generate and present reports of the learners'

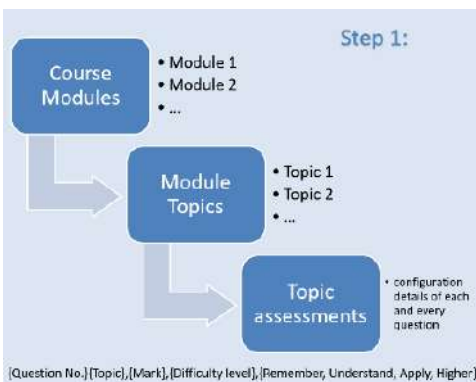


Figure 1: Data collection Procedure (Step 1)

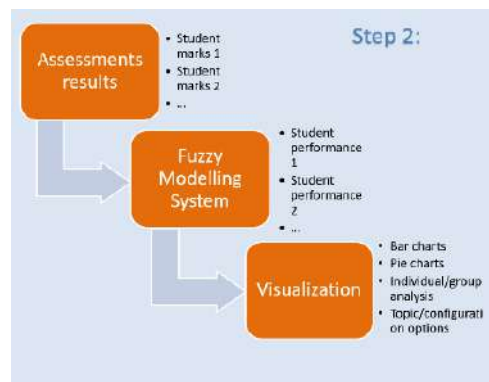


Figure 2: Fuzzy modelling and Visualisation (Step 2)

knowledge in various aspects, such as the learning performance of an individual student in comparison of the average learning performance of whole class (Figure 4). These generated reports on the students' learning performance can support the instructor in

examining the learning performance of either a group of students or an individual student. By referring to these generated reports, the instructor can plan for the intervention, in order to improve the learning performance of the students.

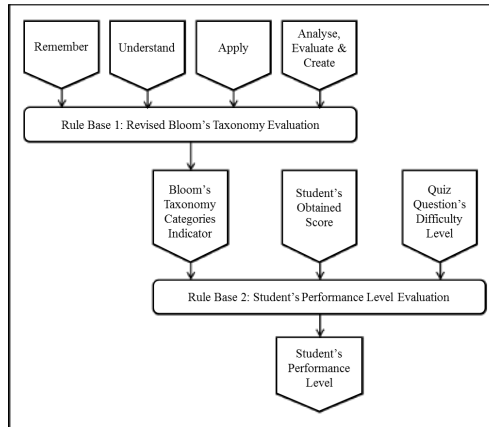


Figure 3: Fuzzy inference system to inference knowledge level

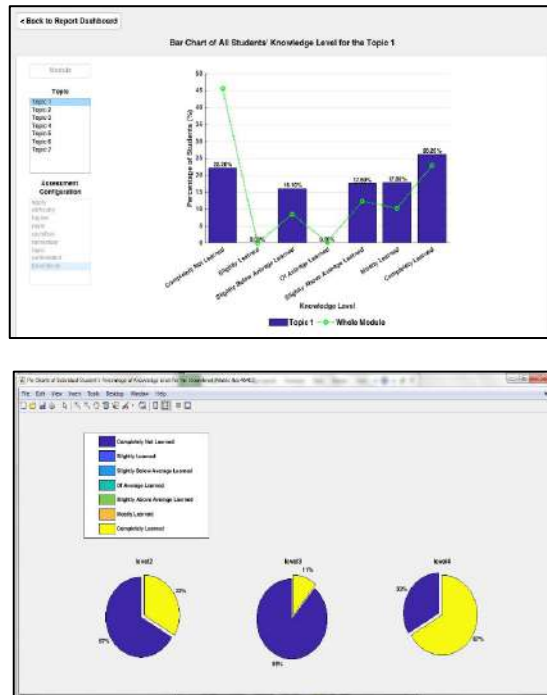


Figure 4: Visualisation generated by the system

CONCLUSION

This study presented a fuzzy learners' knowledge modelling system with purpose of assisting the instructors in personalising learning. The proposed system demonstrated its capabilities of informing the appropriateness of the instructor's practice and assisting them to plan for interventions to personalise learning via the real-world case study. Moreover, the proposed system is able to integrate with the present curriculum. Hence, institutions that apply the proposed system will be able to implement personalising learning with low dependency on infrastructure, facilities, and technical support. To support large-scale implementation of the proposed system at the institution level, future studies on the aspects of usability, scalability, sustainability and accessibility of the proposed system are recommended.

In addition, this study can be a reference for future studies in modelling learners' knowledge and personalising learning. This study presented various related issues in designing and developing a system that can reason, model and report learners' knowledge. This study also demonstrated how the proposed system can help instructors in examining learners' knowledge by leveraging the learning analytics.

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AN EFFECTIVE DELIVERY MODE OF LABOUR NEGOTIATIONS AND CONFLICT MANAGEMENT COURSE (CLASSROOM VS TRIBUNAL SETTINGS)

By Dzulzalani Eden Siti Fateha Dolhadi, Claudia Jiton, Awg Ideris Awg Daud

Introduction

The Labour Management Negotiations and Conflict Resolution is one of the courses offered by the Faculty of Social Sciences and Humanities. It aims to equip students with the theoretical and practical knowledge in conflict negotiations and resolutions in the context of industrial relations and organisation. Traditionally, students acquire knowledge through lectures and role-plays in the classroom. There has been very little attempt to explore the potential of using real-life interventionist approach in enhancing students' knowledge acquisition. The current teaching approaches involve lectures and role plays in the classroom setting to replicate the

actual problem-solving by using simulation and case studies.

Although students would be able to relate the concept and theories used in class to understand the interplay between parties in dispute resolution, they lack actual experience in seeing the real-life drama of a tribunal setting, which displays several important non-verbal communication cues such as emotions, affections and body languages. In addition, students will be able to cross-examine evidences and actively argue to resolve the disputes as well as to interact with actual parties in the dispute resolution.

Objectives

- To investigate the level of knowledge outcome among students using two different teaching approaches (classroom setting vs tribunal setting).
- To assess the impact of using the actual tribunal sets and third-party intervention in teaching and learning
- To propose new model on the appropriate teaching approaches to enhance students' knowledge and skills.

Methodology

- Mixed method (post-intervention questionnaire and in-depth interviews)
- Population = 100 students (Semester 1 and Semester 2 of 2018/2019)
- Quasi-experimental (within group) approach (50 students for 1 semester)
- Independent variables = Mock trial in classroom setting and mock trial in tribunal setting
- Dependent variables = ability to perform problem-solving and conflict resolutions using three different level of dispute resolution continuum i.e. negotiation, mediation (conciliation) and arbitration.

Feedback from the Students

In general, most students gave positive feedback on the experience of having tribunal settings. It has allowed them to gain valuable insights on the actual handling of disputes.

Some of the feedbacks obtained as follows:



The role I played is Gloria co-worker, who is the first witnessing Gloria sleeping during working hours. When we are standing at the witness box, we were nervous to answer the questions that the prosecutor had asked. Because we had read oath for what I had to say must be the truth. In Industrial court, there was a different feeling as compared to the classroom setting because the judge was Mr. Hee that he will ask us a lot of questions that we shouldn't do that in the court. It is a great experience to role-play as a witness in the court if I had a chance, I hope I have the chance to challenge myself to become a prosecutor to question witnesses. ~ OHS

The industrial court experience is different than the class setting roleplay. It is more nervous since the officer is the one who evaluate us as if we are in the real situation. The feeling to sit in the witness cage is the most nervous part since it is a place where no one can tell lies. However, the experience gain was so fruitful and beneficial before entering the industry. Mr. Hee has informed us that our major course, we will actually be the Human resource, and it is important the human resource officer need to know all the negotiations process like the mediation, conciliation and so on. ~SS

*The names of the students are marked only with their Initials. (Taken verbatim and responses may contain grammatical errors)

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Do not confine your children
to your own learning, for they
were born in another time.

~Chinese proverb



