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Cloud-Based Tools and Applications in Enhancing Deep Learning Progression in Malay Language Phonetic and Phonology Course

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ABSTRACT
This study was conducted to identify the cloud-based tools and applications in enhancing deep learning progressionin Malay Language Phonetic and Phonology Course among pre-service teachers of Teacher Education Institute (Institut Pendidikan Guru, IPG). The study employed mixed method research design, namely a sequence of explanatory design. A total of 22 IPG Ipoh pre-service teachers were randomly selected for this study. The research instruments were the questionnaire and the semi-structured interview protocol. Descriptive statistics analysis and interview transcript coding were used to analyse the data. The findings showed high score of engagement in the learning (Min = 5.72, SD = 0.72), moderate score of enhancement of the learning goals (Min = 4.14, SD = 2.21), and low score of extension of the learning goals (Min = 1.65, SD = 1.86). The data obtained from interviews showed that the pre-service teachers with high score (green light level) in all three components of the Triple E Framework had potential to acheive the developing and accelerating level in leveraging digital dimension of deep learning progression rubric. The results revealed that the leveraging cloud-based tools and applications must always meet all the three components of the Triple E Framework during phonetic and phonology learning in order to achieve deep learning.

Keywords: Deep Learning, Cloud-based tools, Leveraging Digital, Phonetic and Phonology, Tools and applications, Triple E Framework.

INTRODUCTION

The New Pedagogy for Deep Learning (NPDL) Global Reports has identified six deep learning competencies (the "6Cs") as those which are required of all learners for success both as students and citizens of the world (Fullan, McEachen and Quinn, 2016). The 6Cs are Citizenship, Charater, Communication, Collaboration, Crtitical Thinking, and Creative Thinking skill. The implementation of NPDL has focus on pedagogical practices and consistent withthe development of contemporary teacher capacities. Based on Jacobs and Alcock (2017), contemporary teachers capacities comprise six job posting: Teacher as self-navigating professional learner; teacher as social contractor; teacher as media critic,media maker, and publisher; teacher as innovative designer; teacher as globally connected citizen; and teacher as advocate for learning and learners. These jobs posting for a contemporary teacher are consistent to deep learning competencies and could be enhanced among the pre-service teachers by leveraging digital such as cloud-based tools and applications

Another focus under the implementation of NPDL are learning partnership and leveraging digital tools and resources. Learning partnership skill is essential element in the development of contemporary teacher capacities and could be developed through teaching and learning activities. Leveraging digital tools and resources such as cloud-based tools and applications could enable pre-sevice teachers to develope their deep learning competencies during teaching and learning activities. For instance, deep learning could be developed among students in teaching and learning Malay Language Phonetic and Phonology course. Leveraging digital skills can be use in phonetic learning when students focus on the sounds of human speech as phisycal phenomenon which involved articulation, acoustics and perception. When the students learn the phonology, they can also use their skills in leveraging digital such as cloud-based tools and applications in studying the distribution and

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patterning of sounds.However, these approaches are still newatthe Institut Pendidikan Guru (IPG). These approaches need to established well before fully implemented of NPDL in all IPGs. Therefore, there is a need to explore the potential of leveraging digital by using cloud-based tools and applications among pre-service teachers of Teacher Education Institute

Cloud-based tools and applications are online or web-based applications that are accessible via a web browser. They range are from basic websites to complex and highly interactive online learning environments. It could be possibly use in teaching and learning Malay Language phonetic and phonology course. Cloud-based tools and applications refer to the vast array of socially oriented, free or nearly free web-based tools. It is a collaborative environment in which users have the opportunity to contribute to a growing knowledge base, assist in the development of web base tools and participate in online communities. The cloud service provides users with different levels of control, flexibility and management. However, Breeding (2012) has categorised cloud-based tools into five categories as follows: (1) Collaborative tools; (2) Data gathering tools; (3) Content creation tools; (4) Presentation tools; and (5) Communications tools. Cloud-based tools and applications could enable more flexibility and new possibilities for improving pedagogy as well as a new set of challenges in how to make best use of the potential of the cloud. According to Fort (2014), Cloud-based tools and applications are becoming more and more popular in the classroom and in the workplace. He suggested some of the best uses of cloud-based technologies in a classroom setting as follow (1) Group projects; (2) Mobile access; (3) Lectures; (4) Educational technology in classroom; and (5) Classroom and student management. Etim, Upula, and Ekpo (2016) had consistent to Fort (2014) when they suggested that the cloud-based tools could provide asynchronous and synchronous collaboration which offers online peer feedback and discussion features. They have the potential to afford collaboration as well as promote the development of a discourse community within the classroom.

Statement of the Problem

Deep learning competencies include the acquisition of in-depth knowledge and understanding of global and intercultural issues; the ability to learn from and live with people from diverse backgrounds; and the attitudes and values necessary to interact respectfully with others. Leveraging digital is one of the vitaldimensions in each six deep learning competencies (6Cs).Based on Fullan (2014), leveraging digital progression could be developed and measured by progression rubric: limited evidence, emerging, developing, accelerating, and proficient. Fullan, Quinn, and McEachen (2018) had suggested four elements of learning design in order to achieve deep learning competecies. These elements are pedagogical practices, learning partnerships, learning environments and leveraging digital. However, the leveraging digital element of the new pedagogies encapsulates a major area of focus regarding the design and effectiveness of NPDL. However, a vital role of cloud-based tools and application are not fully leverage in students learning and development of deep learning competencies.

The use of digital technology in education has demonstrated that digital technology alone is not the answer of deep learning outcomes. The deep learning in action and in outcome embrace digital technology as an enabler of learning outcomes, whereas the new pedagogies, powered by teachers and accelerated by digital technology, are the true drivers of deep teaching and learning. In many cases, students and their learning partners are leveraging digital technologies to gather information, communicate and connect with others, create new tools and learning, and otherwise enable or enhance their development of the 6Cs (Fullan, & Langworthy, 2014). Therefore, the leveraging digital progression by using cloud-based tools and applications among pre-service teachers of Teacher Education Institute should be identified due to their vital roles in direct development of deep learning competencies.

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Purpose and Objectives of the Study

This study was conducted to identify the cloud-based tools and applications in enhancing deep learning progression among pre-service teachers of Teacher Education Institute (Institut Pendidikan Guru, IPG) during teaching and learning Malay Language phonetic and phonology course.In this study, cloud-based tools and application used were categorised into five categories as follow: (1) Collaborative tools, such as Google Drive, Padlet, Blendspace, and Schoology; (2) Data gathering tools, such as Poll Everywhere, and Socrative; (3) Content creation tools, such as Wiki, Go Animate, Voki, Storybird, and Camtasia Studio; (4) Presentation tools such as Youtube; and (5) Communication Tools, such as Facebook (Breeding, 2012). Cloud-based tools and applications used through blended learning mode which involves interacting face-to-face and synchronous as well as asynchronous online interactions.

The learning mode either face-to-face or online interactions are based on deep learning competency that emphasises on 6Cs skills. In the meantime, this study was based on The New Pedagogy for Deep Learning Model (Fullan, Quinn & McEachen, 2018), and Triple E Framework (Kolb, 2017). In particular, the objectives of this study are:

a) to identify the engagement, enhancement, and extension towards learning outcome level based on Triple E Framework among pre-service teachers of Teacher Education Institute during teaching and learning Malay Language Phonetic and Phonology course; and
b) to identify the leveraging digital progression among pre-service teachers of Teacher Education Institute during teaching and learning Malay Language phonetic and phonology course.

Research Questions

Based on the purpose and objectives of the research and literature review, this study intends to find answers to the research questions as followed:

a) What is the level of pre-service teachers' engagement towards learning outcome based on Triple E Framework?
b) What is the level of pre-service teachers' enhancement towards learning outcome based on Triple E Framework?
c) What is the level of pre-service teachers' extension towards learning outcome based on Triple E Framework?
d) What is the level of pre-service teachers' leveraging digital progression based on deep learning progression rubric?

METHODS

This preliminary study used a mixed method design that is the sequential explanatory type design (Creswell, 2012). Quantitative data have been triangulated with qualitative data. Based on Creswell (2012), quantitative data were collected and analysed in advance. This was followed by the collection and analysis of qualitative data. In this study, pre-service teachers are exposed to cloud-based tools and applicationsin various activities for the course of Malay Language Phonetic and Phonology (BMMB3013). For Instance, Phonetic Remembrance *(Zikir Fonetik)* and *Sketsa Sebutan Baku*

Research variables were pre-service teachers' engagement towards learning outcome, pre-service teacherenhancement towards learning outcome, pre-serviceteachers' extension towards learning outcome, and pre-service teachers' leveraging digital progression. The participants of this research are 22 pre-service teachers of Bachelor of Teaching Program in Teacher Education Institute (Ipoh Campus).

Instruments

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The instruments used in this study consists of cloud-based tools and applications (Google Drive, Padlet, Blendspace, Schoology, Poll Everywhere, Socrative, Wiki, Go Animate, Voki, Storybird, Camtasia Studio, Youtube and Facebook), The Triple E Measurement Tool (Adapted from Kolb (2017)), Leveraging Digital Progression Rubric, and structured interview questions. The NPDL Model (Fullan, Quinn, McEachen, 2018). Leveraging digital progression rubric was a dimension in NPDL Progression Rubric (New Pedagogies for Deep Learning Partnership, 2014).

The questionnaire was adapted by the research team based on Triple E Framework (Kolb, 2017) and tailored to the leveraging of Cloud-based tools and applications. The questionnaire consisted of constructs of the Engagement in learning goals, Enhancement of learning goals, and Extension of learning goals by leveraging cloud-based tools and applications. All the three items for each construct are measured by three scale: No (0), Somewhat (1), and Yes (2) (Kolb, 2017). The totals point then were classified into three categories : 13 – 18 Points (Green light) (A lesson is meeting all three components of the framework); 7 – 12 Points (Yellow Light) (A lesson is meeting at least two of the three levels of the framework ; and 6 Points and Below (Red Light) (A lesson is meeting only one level of the framework).

Leveraging digital progression rubric used for determine the leveraging digital progression level from limitedevidence to proficient level.This rubric was adapted from New Pedagogies for Deep Learning Global Partnership (2014). Structured interviews were developed to identify how does the potential of leveraging digital in learning using cloud-based tools and applications among pre-service teachers of IPG.

Data Collection Procedures

The process of data collection was done immediately after students finished studying the topic by using the cloud-based tools and applications. Questionnaires were administered to the students involved as participants in this study. Subsequently interviews were held involving some survey participants. All quantitative data obtained through data collection procedures are analysed using the "Statistical Package for Social Sciences (SPSS)" version 23. The interview data were analysed qualitatively using NVivo software version 10.0.

RESULTS AND DISCUSSION

The study participants consist of 22 students of 20 females (91.0 %) and 2 males (9.0 %). They learn Malay Language phonetic and phonology course as a major course in order to complete the bachelor degree in teaching program. All of the study participants aged between 20 years to 30 years. In short, they are the generation Y, born in between 1977 and 1997 (Prensky, 2001).

The level of pre-service teachers' engagement towards learning outcome based on Triple E Framework

The results showed that the cloud-based tools and applications meets the engagement level of the framework. The findings showed high score of engagement in the learning (Min = 5.72, SD = 0.72), moderate score of enhancement of the learning goals (Min = 4.14, SD = 2.21). The cloud-based tools and applications allow pre-service teachers' to focus on the assignment or activity with less distraction (time-on-task) (Mean = 2.00; SD = 0.00), and able to motivates students to start the learning process (Mean = 1.77; SD = 0.43). Another interesting findings showed that the cloud-based tools and applications causes a shift the behaviour of pre-service teachers from passive to active social learner (Mean = 1.55; SD = 0.51).

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The level of pre-service teachers' enhancement towards learning outcome based on Triple E Framework

The findings showed moderate score of enhancement of the learning goals (Min = 4.14, SD = 2.21).The cloud-based tools and applications allow students to develop a more sophisticated understanding of the learning goals or contents (Mean = 1.41; SD = 0.73), and able to create scaffolds to make it easier to understand concepts or ideas (Mean = 1.45; SD = 0.74). The cloud-based tools and applications also create paths for students to demonstrate their understanding of the learning goal in a way that they could not do with traditional tools (Mean = 1.27; SD = 0.88).

***The level of pre-service teachers' extension towards learning outcome based on* Triple E Framework**

The findings showed low score of extension of the learning goals (Min = 1.65, SD = 1.86).Result showed that the mean of the cloud-based tools and applications create opportunities for pre-service teachers to learn outside of their typical class of IPG has not fulfilled the extension level (Mean = 1.00; SD = 0.98). On the other hand, the pre-service teachers unable to use the cloud-based tools and applications to create a bridge between learning and everyday life experiences (Mean = 0.68; SD = 0.72), and also unable to develop skills that they can used in their everyday lives (Mean = 0.18; SD = 0.39).

Overall, the mean score of point totals of the three components has met the Yellow Light category (Mean = 11.32; SD = 4.79). Based on Triple E Framework, Yellow Light indicates that the cloud-based tools and applications is meeting at least two of the three levels of the framework. By meeting at least two levels (engagement and enhancement), there is a strong connection between digital technologies and pre-service teachers' comprehension of the learning goals. However, this may be an opportunity to add more instructional moves into the connectivism learning and cloud-based tools and applications to better leverage the technology for student learning (Kolb, 2017). In addition, the leveraging digital technologies must always meet all three components of the framework in order to achieve deep learning.

The level of pre-service teachers' leveraging digital progression based on deep learning progression rubric

The participants with green light level of Triple E Framework tend to react positively when asked about the use of cloud-based tools and applications in their teaching and learning. They had great potential to acheive the developing and accelerating level in leveraging digital progression rubric. In short, these findings showed the consistency between the Triple E Framework (Kolb, 2017) and Deep Learning Progressing Rubric (NPDL, 2014). This might suggested that the student must engaged to learning outcome, enhancing learning by the technology and able to extend their learning to practical practices or real world for ensuring the successful of deep learning among students. The more mindful use of the technology, the more leveraging digital progression towards deep learning. This finding also supported the deep learning model as suggested by Fullan, Quinn, and McEachen (2018).

CONCLUSION

This study was conducted to identifythe cloud-based tools and applications in enhancing deep learning progression among pre-service teachers of IPG during teaching and learning Malay Language Phonetic and Phonology course. Overall, the results showed that the leveraging digital by using cloud-based tools and applications was meet the Yellow Light category based on three components of Triple E Framework. Yellow Light indicates that the cloud-based tools and applications use among pre-service teachers in connectivism learning is meeting at least two of the

three levels of the framework. By meeting at least two levels (engagement and enhancement), there is a strong connection between digital technologies and pre-service teachers' comprehension of the learning goals. The pre-service teachers with high score (green light level) in all three components of the Triple E Framework had potential to acheive the developing and accelerating level in leveraging digital progression rubric. With the advent of technology, there are a lot of potential in leveraging digital in teaching and learning. However, this study revealed that the leveraging digital tools must always meet all the three components of the Triple E Framework in order to achieve deep learning.

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