Teacher Pedagogical Constructs Based on 21st Century Learning Model For Theoretical Subject Delivery In School

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Teacher Pedagogical Constructs Based on Model 21st Century Learning For Theoretical Subject Delivery In School

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Abstract. This study aims to examine the teacher's pedagogy based on the learning model 21st century aspect of digital age literacy for theoretical subjects in school. The use of digital era literacy in technology, visual and information literacy in 21st century teaching and learning.

The population of the study is the teachers who have the teaching experience less than ten years and use this digital era literacy approach as a pedagogy of teaching and learning or as a facilitator in ICT. The data obtained were analyzed using coding and analysis to identify themes according to categorized patterns and meanings.

The objective of the study is to explore the elements in the era of digital-era literacy constructions pedagogical needs of PPG teachers teaching theoretical subjects in school. Findings shows that there are 15 themes obtained based on interview protocols which affects all three literacy. The theme is deepening of technology, visual interpretation, enhancing student thinking, accessing information, using latest applications, integrating multiple media, guiding information access, gaining student reflection, stimulating student thinking, shaping student's soft skills, adapting materials, motivating, diversifying techniques, value and support. However, the study This is done to apply technology with the content and teacher pedagogy for use in 21st century learning and learning among PPG teachers.

1. Introduction

The 21st century generation needs the right look and shape that can meet expectations and current and future educational needs. Not to mention the current teacher's call, but it is necessary switch to the caller's call that looks more appropriate. Changes in teaching and learning methods learning also needs to be in line with the advancement of advanced technology. Content the relevant teaching according to current developments is a more dynamic approach and creative to use rather than conventional teaching methods such as "chalk and talk" less interest in students. According to the application of this technology there are eight important literature's in the 21st century but the main one needed are three, which are the technology literacy, visual and visual literacy information literacy. However, the use of this technology depends on the teacher's pedagogical skills material-centered to allow the contents of the lesson to be easily understood by students and delivery of teachers in an attractive and more effective form.

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The use of the Reeves study criteria (1994), 'Pedagogical dimension' has four the twelve that need to be emphasized. Quinn (1996), 'Educational design heuristics' and Albion (1999), 'content heuristics' has nine. While Squires & Preece has two years different (1996), 'JIGSAW model' four and (1999), 'Learning with software heuristics' eight. Horila, Nokelainen, Syvälän & Overlund (2002), 'Pedagogical usability of digital learning environments' eleven and Nokelainen (2006), ten.
Based on the cervix, Reeves (1994), Albion (1999), Horila, Nokelainen, Syvllnen & Overlund (2002) and Squires & Preece (1999) that can be attributed to digital era literacy according to the three selected constructions namely technology literacy, visual literacy and information literacy. Share Reeves' technology literacy (1994) has a connection with the technology construct of the Program flexibility and cooperative learning. The flexibility program is the use of materials flexible learning that takes into account student differences. For example a test given, students can provide previous information and students' interest in the topic learning to provide benefits for student preparation. Cooperative learning also is a cooperative learning method with students to achieve the same learning goals. In addition, it is more structured than collaborative learning because teachers have control through the use of learning materials with computer aided.

The visual literacy constructs using the Albion approach (1999) state the source videos that are based on one's ability to get information are high. This model in the heuristic assessment of usability research is a formative evaluation preliminary technique digital system. The Albion model involves the presentation of Video Resources that makes pedagogues teaching and learning become more interactive and can help students acquire information. Horila, Nokelainen, Syvllnen & Overlund (2002) use Graphic and layout as the an approach that helps students to identify what they are learning.

Next Squires & Preece (1999) uses the prevention of peripheral cognitive errors and match with curriculum in information literacy. Prevention of peripheral cognitive refers to Prevention of cognitive errors involving mistakes of perception, cognitive and motor. However thus, prevention of mistakes should be done by eliminating by using techniques good coding, maximizing recognition, reducing memory, designing referrals that are not and allows repeat consideration made by the user for example move files from recycle bin. Match with curriculum is done to test the level of understanding students about the information they want to convey to the objectives of pedagogical learning and achievement can be implemented. The pedagogy in this study focuses on the teachers and the elements derived from the findings are verbal forms which continue to refer to the actions of the teachers themselves during the teaching and learning of the 21st century.

The 21st century is synonymous with digital-era literacy that ICT stands for application in education. However, the applicability of this ICT technology with the content of the lesson and teacher pedagogy is still undetermined. Expected to happen the duration of pedagogy, the use of technology and the content of the lessons with the features of the 21st century students. Additionally, the level of readiness of teachers in mastering digital-era literacy skills has not been can be ascertained during the process of coloring and learning, in particular theoretical subjects in various subjects in school. Therefore, this study is conducted to explore purification teacher pedagogical construct based on the 21st century learner model of Digital Age literacy for the needs of PPG teachers who teach theoretical subjects in regular daily primary schools.

2. Model of 21st Century Learning

The 21st century learning model is the approach used in teaching and learning. This study uses a model 21 st Century Skills enGauge (Cheryl, 2002) and referring to other models of The Inside-Out of School: A 21st Century Learning Model (Wendell Berry, 2009) and the Framework for the 21st Century Learning (Partnership for 21st Century learning (p21), 2007). Through the 21st century learning models there are differences in terms of components which enGauge 21st Century Skills Cheryl (2002) under the literacy component Era Digital, The Inside-Out of School: A 21st Century Learning model (Wendell Berry, 2009) under Expanding component Literacies and Frame Work for the 21st Century Learning (P21), 2007) under component 21st Century Student Outcomes.

Model enGuage 21st Century Skills (Cheryl, 2002) were used in this study because has a deeper assessment of the technology, visual and information literacy which is included in the different constructions found in digital age literacy. Two other modules incorporate literacies within a single construct. Although there are eight constructs in digital age literacy, this study focuses only on just the three parts. The technology literacy in this model describes the technology in terms of how it works,
its purpose, its ability to be efficient and effective for achieve a certain goal. Visual literacy is also the ability to interpret, use, respect and create thought, decision making, communication and learning. Furthermore, information literacy is the ability to evaluate misunderstandings across various media, recognize the information required, track, synthesize and use information effectively to achieve the functions by using technology, network communication and electronic resources.

The Inside-Out of School: A 21st Century Learning Model also incorporates all the literacy existing with emphasis on analyzing, evaluating and synthesizing information as it may reliable, Critical study of media dependency and thought, material use evolving media, media designs for authentic purposes, digital data sources and not self-monitored digital and artistic and useful content selection patterns. The final model ie Framework for the 21st Century Learning also consolidate all existing literacy emphasizing the various features of information literacy accessing a lot of information, efficiently (time) and effective (resources), evaluating information critically and efficiently. Media literacy analyzes media by understanding how and why media messages are built and what the purpose is. Share technology literacy needs to use technology as a tool to research, manage, evaluate and communicate using digital technology such as computers. Hence, the models it can be seen almost the same approach used. However enGuage model 21st Century Skills are an option in conducting this study.

3. Methodology

The study was conducted using a qualitative study design involving three people study participants who have less than ten years of teaching experience and using this digital era literacy approach as a teaching and learning instructor learning or being a facilitator in ICT.

The first researcher selected for this study was a teacher, a female teachers with ten years of teaching experience in the field Malay language. In the school where this study, he uses a digital era literacy approach during the teaching and learning sessions. In addition, the participants of this study conducted a teaching and learning workshops using digital era literacy using frogs VLE. The second participant selected for this study is an education technician, a man with ten years of teaching experience in the field educational technology. He will monitor schools to ensure teachers conducting learning and learning using digital era literacy approaches. Participants The next study is a teacher as well, a male teacher who has teaching experience about ten years in English. In school place this study, he uses the digital era literacy approach during teaching and learning sessions learning is done.

The research instrument involves an interview protocol that will be developed based on the pedagogical fundamental framework of teachers is based on the use of educational technology that is referred based on enGauge model 21st Century Skills Cheryl (2002). The interview protocol can be seen as a method the most widely used in qualitative research (Brayman & Bell, 2003). Next, the data the analysis of this study was obtained through several steps, after the interview was conducted with a the transcription of the interview, the theme analysis is obtained by performing which pre coding generated by selecting keywords (code) that describes an issue in the data. Then the axial coding categorizes the coding that has the same character or meaning. Next selective coding by selecting which axial coding corresponds to a theory study will be reviewed. The next step of the draft definition that identifies issues / themes / patterns and meanings. Issue can be identified through the theme obtained. Patterns and meanings are determined through these themes and each theme is categorized so that patterns and meanings can be identified and the analysis data can be acquired.

4. Result

Based on the data analysis, there are 15 themes that have been found, namely technology exploration, visual interpretation, improving student thinking, accessing information, using latest applications, integrating multiple media, guiding information access, gaining student reflection, stimulating student
thinking, developing student's soft skills, customize materials, motivate, diversify techniques, nurture value and support.

**Deepening Technology**
The study participants stated that in pedagogy it is necessary to deepen the technology to know the use of technology, its function in helping the teacher during the lesson and learning sessions in the classroom. The proof:

"... knowledge about the use of technology, how its function and purpose in helping teachers ..." (P1)

"... Knowledge of what technology means, usability and the purpose of the technology can serve ..." (P2)

"... the knowledge and the use of technology especially in PdPc ..." (P3)

**Visual Interpretation**
The researcher mentions that teacher pedagogy in teaching and learning is necessary for visual interpretation of the smooth use of images, videos and objects used. The proof:

"... proficiency of interpreting material using image, video or object ..." (P1)

"... Ability to interpret image and video use ..." (P2)

In addition, to ensure the smooth use of visuals, it is necessary to interpret the actions, objects or visual symbols used during the teaching and learning activities. The proof:

"... the ability to interpret visual acts, objects, or symbols ..."

**Improve Student Thoughts**
Participants of the study said that to improve students' thinking in pedagogy of teaching and learning should link the objects seen with life to train students to think to make decisions. The proof:

"... Students associate the objects seen with daily life ..." (P1)

"... Enhances student thinking especially in making decisions ..." (P2)

**Accessing Information**
The study participants stated that in information literacy fairs there is a need to access information for information actively. The proof:

"... actively seeking, accessing, acquiring and using information ..." (P3)

In addition, the ability to evaluate information in learning and learning is also mentioned by the researcher. The proof:

"... the ability to evaluate information across various media ..." (P1)

"... the skills used to find information, the ability to access and evaluate information ..." (P2)
Using the Latest Apps
Participants in the study state that in technology literacy pedagogy there is a comprehensive learning technology using the latest application in teaching and learning. The proof:

"... using calestia learning applications ..., ... comprehensive learning applications such as 'Edmodo' ..." (P2)

Integrate Multiple Media
Participants in the study stated that in visual literacy pedagogy there should be a diverse learning by using object matching with the topic. The proof:

"... Using images / visuals, objects and videos that are relevant to the teaching topics ..." (P3)

Guiding Information Access
Participants of the study state that in information literacy pedagogy there is a need for effective information by guiding pupils in using existing resources. The proof:

"... guide students to find / access and obtain the necessary information using existing resources." (P3)

Furthermore, guiding information access by having the ability and ability of the teacher itself to determine the information and ability of the student itself to obtain accurate information. The proof:

"... the ability of the information to be evaluated and transmitted across multiple media." (P1)

"... the ability of the student in determining the exact information needed ..." (P2)

Obtaining Student Reflection
The participants of the study tell that the teacher's pedagogy needs to get a reflection of the students to ensure that students focus on teaching and learning on the run so that the assigned object is achieved. The proof:

"... the current student focus should be given attention ..." (P1)

"... attracting student attention if such literacy is used ..." (P3)

Another addition given by the study participants is to get the reflection of the students to know the learning environment used by the students. The proof:

"... create a challenging yet fun learning atmosphere ..." (P2)

Stimulate Students' Thought
The study participants stated that in elemental pedagogy stimulating student thinking should be included in teaching and learning in the preparation of student materials in the 21st century teaching. The proof:
"... providing material that can stimulate students in learning this 21st century ..." (P1)

**Developing Soft Skills for Students**  
Participants of the study tell us to develop student's soft skills, teachers need to encourage students to communicate and think critically. The proof:

"... encourage students to communicate using materials provided ..." (P1)

"... encourages students to think critically ..." (P3)

**Adapting Materials With Content**  
The study participants noted that the effectiveness of literacy needs to be adapted to the content with the content to help students solve related questions. The proof:

"... materials that are relevant to the teaching content can help students solve related questions." (P2)

**Motivate**  
Participants in the study tell that in pedagogy there must be an element of motivation to motivate and improve the achievement of the students through the teaching and learning delivered. The proof:

"... for those who show an improvement to their achievement, I will give a gift ..." (P2)

"... as encouraging the students to continue to work, I'll give you some money ..." (P3)

**Diversifying Techniques**  
Participants of the study stated that the technology literacy approach needs learning activities by diversifying the techniques used in teaching and learning such as forums, quizzes and gamutics. The proof:

"... an interesting quiz to challenge students' understanding ..." (P1)

"... insert the gamut element which students learn through play ..." (P2)

**Nurturing Value**  
Participants in the study say that in delivering the teaching of teachers there should be a value-nurturing element such as cooperation and solicitude so that students compete in a healthy manner in giving their opinions, especially through discussion. The proof:

"... nurturing the value of student collaboration in group discussions ..." (P1)

"... the solidarity of students in competing in health to give opinions ..." (P2)

**Give Support**  
The participants of the study stated that the element of support should be in the teacher's pedagogy so that students get the right information and compare the information obtained. The proof:
"... the student should know a proper and precise way to get the right information ..." (P1)

"... comparing, managing, compiling and combining information obtained ..." (P3)

Additionally, study participants who provide support to students can encourage students to obtain information independently. The proof:

"... encourage students to get information using computers independently ..." (P2)

Through the findings of the study, these 15 elements prove that it can help pedagogical teachers towards 21st century teaching and learning by applying these approaches to attracting students. The elements of action taken to encourage students to involve themselves during teaching and learning are carried out to achieve the objectives set by teachers on several topics.

5. Discussion

There are 15 themes that show teacher pedagogy in the 21st century of digital age literacy for theoretical subjects in school. The theme of this study is to explore technology, visualize ideas, improve student thinking, access information, use latest applications, integrate multiple media, guide information access, get student reflection, stimulate student thinking, develop student's soft skills, customize material, motivate, diversify techniques, nurture value and support.

Based on Reeves (1994), there are 14 elements of teacher pedagogy namely learner control, pedagogical philosophy, underlying psychology, goal orientation, experiential value (authentically), teacher role, program flexibility, value of errors, cooperative learning, motivation, epistemology, accommodation of individual differences (scaffolding) and cultural sensitivity. Among these elements there are three that are parallel to the income of this study is experiential value (authentically), flexibility and Motivation program. Quinn (1996) has nine pedagogical elements: clear goals and objectives, context meaningful to domain and learner, content clearly and multiply represented and multiply navigable, activities scaffold, elicit learner understandings, formative evaluation, performance should be 'criteria referenced', support for transference and acquiring 'self-learning' skills and support for collaborative learning. The two elements are the same as the findings of these studies, namely scaffold and support for transference and acquiring 'self-learning' skills. Squires & Preece (1996) also has four elements: specific learning tasks, general learning tasks, application operations task and general system operation task. Based on the elements mentioned above there is one that is similar to the findings of this study which is specific learning tasks. While Albion (1999) contains nine elements: establishment of context, relevance to professional practice, representation of professional responses to issues, relevance of reference materials, presentation of video resources, assistance is supportive rather than prescriptive, materials are engaging, presentation of resources and overall effectiveness of materials. The elements have one of the same as the findings of this study which are materials are engaging. While Squires & Preece (1999) has seven elements, the appropriate level of learner control, navigational fidelity, match between designer and learner models, prevention of peripheral cognitive errors, understandable and meaningful symbolic representation, support personally significant approaches to learning, strategies for the cognitive error recognition, diagnosis and recovery and match with curriculum. This element also has only one in parallel with the findings of this study ie support personally significant approaches to learning. Furthermore, Horila, Nokelainen, Syvinen & Overland (2002) have 11 elements namely learnability, graphics and layout, technical requirements, intuitive efficiency, suitability for different learners and different situations, ease of use: technical and pedagogical approach, interactivity, objectiveness, sociality, motivation and added value for teaching. Through these elements there are four elements that are in line with the
findings of this study, namely technical requirements, interactivity, motivation and added value for teaching.

With the last five studies shown in the teacher's pedagogy there are elements that are always applied in teaching and learning is there are two elements that cover the suitability of the materials used and the value of the conveyances presented. In addition, based on the previous study of Reeves (1994) and Horila, Nokelainen, Syvīnen & Overland (2002) agreed that the motivational element is an important pedagogical element used in teaching and learning in line with the findings of the study. While Squires & Preece (1996) has other elements with elements that must be present in the students are all elements that involve tasks which are contrary to this income study and all previous studies that do not mention this element.

6. Conclusions
This study examines the 21st century teacher pedagogical constructs of which 15 elements are found. Implications for these elements should necessarily be practiced in current teaching and learning in the use of digital literacy aspects as an approach to learning and learning among PPG teachers. This is because, technological developments have influenced the 21st century learning style that should be quite different from previous students.

7. References
[1] Albion, P. (1999) Heuristic evaluation of educational multimedia: From theory to practice. Paper presented at the 16th Annual conference of the Australasian Society for Computers in Learning in Tertiary Education.
[2] American Association of College of Teacher Education & Partnership for 21st Century Skills (2010). 21st Century Knowledge and Skills in Educator Preparation. U.S: Pearson.
[3] Berry, W. (2012). The Inside-Out School: A21st Century Learning Model. Teachthought We Grow Teachers. Available from http://www.teachthought.com/the-future-of-learning/inside-outside-school-21st-century-learning-model/
[4] Cheryl, L. (2002). NCREL’s enGauge 21st Century Skills: Digital Literacies for a Digital Age. Naperville, |||.: North Central Regional Educational Laboratory.
[5] Framework for 21st Century Learning. Teachthought We Grow Teachers. Available from http://www.p21.org/about-us/p21-framework/349-media-literacyteachthought.com/the
[6] Horila, M., Nokelainen, P., Syvīnen, A., & Overlund, J. (2002). Criteria for the pedagogical usability, version1.0, Hameenlinna, Finland: Hame Polytechnic and University of Tampere.