CONCEPTUAL FRAMEWORK OF VIDEO LEARNING BASED ON POPBL AND CBE

Khairul Anuar Abdul Rahman, Muhammad Sukri Daud, Yusri Kamin & Norazrena Abu Samah

ABSTRACT

Demonstration method is often used in technical and vocational teaching. This has led to a longer period of teaching and learning (T&L) and is difficult to be repeated if the student missed it. In addition, the diversity of students' backgrounds affects how they think, insofar; influence their thinking skills and the knowledge exhibited. Therefore, the use of video in T&L is the latest alternative to allow students to see the process involved in practical and stimulate students' ability to engage in T&L. This should be added to the Competency-based Education (CBE) and Project Oriented Problem Based Learning (POPBL) because the concept of learning is appropriate for compentecy-based education as well as to establish the characteristics of the competencies required by employers. Therefore, this study was undertaken to identify the conceptual framework of video learning based on POPBL and CBE. This conceptual framework was built based on the analysis results of previous study and will be tested by experts for further research.

Keywords: POPBL, CBE, Video, Conceptual framework

INTRODUCTION

Technical and vocational education (TVE) without a doubt is the catalyst for national development (Asnul Dahar, et al., 2013). Teaching and learning process in TVE should not only focus on chalk and talk method, but should also emphasize competencies (Marina & Jamil, 2013). Utilization of various teaching aids is very important to ensure that students can master a task in a specific competency before moving to a new task. Therefore, competency-based education in teaching skills has become a necessity in education (Asnul Dahar, et al., 2013; Drive & Asnul Dahar, 2006; Lokman, Nurul Qistin, and Mohd Hanafi, 2009; Marina & Jamil, 2013).

Competency-based Education (CBE) is very effective to be used in education as it aims in training individuals of the skills related to workplace (Asnul Dahar, et al., 2013; Marina & Jamil, 2013). Competencies and learning outcomes are the main models and keys to solution of problems in technical and vocational education at present time such as problems in technological changes and the gap between education and employment needs (Edwards, Sánchez-Ruiz, & Sánchez-Díaz, 2009; Ennis 2008; Gasperini, 2009). This problem has also been highlighted in the Ninth Malaysia Plan (RMK-9), where there is a need to use strategic approach of CBE in producing skillful and knowledgeable human capital of (Asnul Dahar, et al., 2013).

In achieving developed nation status in 2020, employers are becoming more critical in the selection of new employees (Rasul, et al., 2009). This is due to the quality of graduates produced by local universities who did not exhibit the required competencies according to job sector and low capability of graduates to master social skills and manners effectively in the society (Othman et al., 2008). This finding is in line with the technological changes which is constantly improving and advancing from time to time (Hamzah & Musta'mal, 2012). This goes along with the government's desire to create and strengthen human capital skills and knowledge contained in the second core of RMK-9 that is to increase the

capacity for knowledge and innovation (Asnul Dahar, et al., 2013). Therefore, POPBL should be applied in T&L to produce workers who are innovative, creative, and able to solve problems, work in teams and manage projects.

Studies conducted by Hernández-Ramos (2007) and Sampson and Fytros (2008) proved that the use of technology in education offers huge potential as it introduces an innovative teaching and learning modalities among students with different backgrounds. It also provides learning experiences that are similar to student life experience (Potter, 2005) and also provides support, extend or change in pedagogy and curriculum output (Kearney & Schuck, 2004). Technology and pedagogy are often seen from the perspective of constructivist (Jonassen, et al., 2003).

In line with the development of technology in the country, the application of video learning is highly encouraged to be used as one of the teaching methods, especially in TVE. It aims to produce students who are skillful and knowledgeable. This is to fulfill the government's efforts to produce highly competent human capital (Shiung & Ling, 2005). The use of the video too has shown that it has helped educators in T&L process, helped students improve their understanding in mastering a subject (Ismail et al., 2006; Jurich, 1999; Zurina & Zaidatun, 2006) and prepared the students to be equipped with lifelong learning and be proactive when entering the workforce (Gasperini, 2009).

In addition, the use of video also encourages students to take greater responsibility towards their learning by enriching learning experiences (Kearney & Schuck, 2006). This is also supported by Norton (1985), who found that the experience of using learning resources such as video materials can enhance learning and self-direction. Quality video production following the national curriculum can contribute to the success of nation education in the future (Ismail et al., 2006). The use of video technology in learning can also bridge the gap between the artificial environments of the school to the realities of the classroom (Jurich, 1999). The use of video in T&L gave a huge impact and is effective in influencing and attracting students' interests and motivation as well as

encouraging students to yield more efforts. In all, it can make learning to be more meaningful in achieving the learning objectives (Jiar & Fakhri, 2010; Waters & Jones, 2011).

Nonetheless, the use of video in TVE was something new and underused (Hamdan Mohd Yasin, 2010). According to him, if learning to be done using video, it is expected that teachers to be ready to integrate information and communication technologies in the T&L process. In addition, preliminary studies conducted in a vocational training center previously has shown that students did participat in T&L that used video, but the T&L has failed to implement the desired skills and failed to build problem-solving skills. This is because the video that they used was not carefully developed. Therefore, this study was undertaken to identify the conceptual framework of video learning based on POPBL and CBE in TVE.

COMPETENCY-BASED EDUCATION (CBE)

CBE is a practical approach that is based on the student's ability and society's competency requirements (Frank, et al., 2010). According to Frank et al. (2010) CBE did not emphasize on time-based training and it promises accountability, flexibility and is student-centered. CBE was first introduced in 1992 in Australian Vocational Education and Training (VET). Its objective is to achieve demonstration skills according to the industry standards (Mulcahy, 2000). These skills and knowledge required of the individual are needed to meet the expectations of the workplace rather than relying on the learning process solely (Shellabear, 2002). Through CBE, engineering and community members can show the behavior, knowledge, skills and necessary abilities to perform their duties at the highest level of efficiency through a mix of experience, training and education (Dallosta, 2011).

According to The National Council on Technical and Vocational Education and Training (2006), CBE elements include tasks for students that are recognized by industry experts, provide

opportunities for students to enhance their competencies and assessment of knowledge as well as attitudes and competencies. The competencies to be assessed are informed beforehand to students. This is to ensure that the teaching is in line with the objectives set and the students would be able to show their competencies during T&L process. Besides that, according to Norton (1985) and Asnul and Kandar (2006), the application of the CBE involves a variety of methods and teaching materials.

CBE is advantageous as it is more training oriented and is able to shape a future worker amongst students as they need to undergo employee training program or focused-competency program. These programs focuses on the knowledge and skills of the job specifications based on industry and employers competency standards (Hall & Jones, 1996; Mansfield, 1989; Mulcahy, 2000; Tuxworth, 2005; Williams, 1997). CBE also stated that prerequisite information and directions need to be provided together with the module (Asnul Dahar, et al., 2013; Hall & Jones, 1996; Norton, 1985; Stanley Elam, 1971; The National Council on Technical and Vocational Education and Training, 2006). In addition, CBE offers courses that are relevant and balanced to the needs of consumers and society (Mulder, 2012; Stanley Elam, 1971). Furthermore, CBE is an alternative to meet current needs and not just looking at individual result-driven achievements only. (Kandar & Asnul, 2006). Assessments involved in CBE are pre assessment and post assessment (Asnul Dahar, et al., 2013; Hall & Jones, 1996; Marina & Jamil, 2013; Norton, 1985; Stanley Elam, 1971; The National Council on Technical and Vocational Education and Training, 2006).

CBE programs in T&L is more focused as it follows the syllabus and systematic teaching where teaching facilitates the development and assessment of competence-oriented coach, teacher as fasilatator and promote lifelong learning (Asnul Dahar, et al., 2013; Marina & James, 2013; Stanly Elam, 1971; Williams, 1997). In addition, this program also provides sufficient and complete equipment to provide experience to students (Norton, 1985; The National Council on Technical and Vocational

Education and Training, 2006). Through CBE, the student will be informed of the criteria of competence and attitude needed in the workplace and the role given before students follow the modules. Requisite information and directions provided together with the module and the competence that need to be achieved first are identified, validated and disseminated (Asnul Dahar, et al., 2013; Norton, 1985; Stanley Elam, 1971; The National Council on Technical and Vocational Education and Training, 2006).

According to Kyobe and Rugumayo (2005), CBE is an approach to technical education and vocational training which emphasizes the development of skills and abilities that are actually needed in the working world. The instructor will provide a learning environment that resembles the work environment (Mansfield, 1989; The National Council on Technical and Vocational Education and Training, 2006; Williams, 1997). Through CBE, the focus shifted from input in the training to required training at workplace or industry standards (Hall & Jones, 1996; Mulcahy, 2000; Tuxworth, 2005; Williams, 1997).

The study conducted by Hall and Jones (1996) and Williams (1997) found that CBE is a mastery learning where there is no provision in the learning time in achieving different competencies and values. Instructor will provide a complete and easy instructions to help students to master competencies that are being determined (Norton, 1985), as well as providing tasks in the real world of workplace to be completed by students before being given the next task (Williams, 1997). Learning activities are also graded to help some of the students to have at least a minimum level of competencies (Hall & Jones, 1996). Additionally, the knowledge and understanding were gained through certain experiences that enable students to master quickly with respect to the objectives (Norton, 1985; Wolf, 2005). If students make a mistake during the T&L process, teachers promptly correct students' errors and provide immediate feedback on tasks and tests given (Norton, 1985; Stanley Elam, 1971; The National Council on Technical and Vocational Education and Training, 2006).

PROJECT ORIENTED PROBLEM BASED LEARNING (POPBL)

POPBL is an educational discipline by nature where it can be divided into two themes, namely, project-based and problem-based learning that involves daily lives issues (Krüger-Basener & Kosuch, 2009; Uziak, et al., 2010). Problem-based learning requires students to develop and build the foundation for the synthesis of knowledge from various disciplines (knowledge) while project-based learning requires a wide range of theories and related knowledge (know-why) (Moesby, 2005; Ruhizan, et al., 2011; Uziak et al., 2010).

POPBL approach encourages students to engage in more complex scenarios or complex problems given to them. They need to identify the information they have learned and the skills they need to have to solve the problem (Ruhizan, et al., 2011). In POPBL structured methods, in the early stages of the course, students carried out simple projects in the beginning through self-study followed by critical and complex questions (Moesby, 2005; Uziak, et al., 2010). Many of the early projects were done through self-study that helps students to revise or develop the necessary basic concepts, learn how to use the design tools, develop problem solving and critical thinking skills and develop independent learning skills (Ruhizan, et al. 2011; Uziak, et al., 2010).

The results of the study done by Ruhizan, Saemah and Kamaruzaman (2011) for trainers in 12 polytechnics in Malaysia showed that the use of technology in the implementation of POPBL can have a positive impact on students' knowledge and technical skills. The key features of POPBL are student-centered, providing instruction through skills required, process-centered, group-based, experience-based and problems are treated as the core issue in learning (Ruhizan, et al., 2011; Uziak, et al., 2010).

POPBL application in design and craftsmanship requires special attention because there is evidence that it improves the design thinking, the skills and experience (Ruhizan, et al., 2011). It also promotes and supports the work of the team and improves the

retention of knowledge in valid multi-disciplinary design scenarios, as well as crossing geographical boundaries and cultures. POPBL approach can also help students to learn design thinking effectively because it encourages creativity and enhance a comprehensive approach to solving problems (Uziak, et al., 2010). According to Krüger-Basener & Kosuch (2009), POPBL able to attract female students to study science and technical subjects.

According to Moesby (2005), the characteristics of the application of POPBL is to state the problem according to level, strong group planning which is led by individuals who are experienced in every level and validated discussions are the keywords used in categorizing individual skills and talents. In addition, through POPBL, students' personal efficiency is very significant and higher when compared with conventional techniques. POPBL is also seen to be having the potential to foster the ability of students to learn actively, think critically and solve problems through teaching process that focuses on practical tasks (Aziz, Sicard, & Dhia, 2010; Othman et al., 2008). It also encourages students to conduct group discussions. Moreover, POPBL can create independent learning, improve soft skills, develop first class human capital and form an active, constructive and creative learning (Othman et al., 2008).

According to Dolog et al., (2010), POPBL have different perspectives among students, teachers or trainers and educational institutions. From the students' perspective, POPBL involves problems related to everyday life, which attract students' interests and increase students' motivation. Meanwhile, lecturers or teachers believe that POPBL promotes mutual learning among their students. Finally, from the perspective of educational institutions, POPBL is viewed to able to motivate students, produce graduates who are competent and enhance collaboration between institutions and industry.

CONCEPTUAL FRAMEWORK OF RESEARCH

CBE model has certain characteristics which are; predetermined training, results of assessment, involvement of industry in determining the success of a training program and training program that follows the industry standard competencies (Mulcahy, 2000). It is also training-oriented where learning objectives are clearly stated and correlated and the course elements are appropriate and proportionate, suitable with the needs of customers and society (Mulder, 2012). From the results of the documents analysis carried out by researchers, there are 17 characteristics of CBE that will be highlighted in this study.

POPBL is a suitable approach in teaching engineering subjects (Moesby, 2005). Therefore, POPBL will also be referred in this study. From the results of the documents analysis carried out by researchers, there are nine characteristics of POPBL. Through POPBL, students will be actively involved in stimulating learning experience through teaching that emphasize skills and process centered, encourage them to think critically and innovatively, solve problem and also encourage group discussion amongst them (Aziz, et al., 2010). Therefore, the 17 features characteristics of CBE and nine characteristics of POPBL will be the fundamental in the construction of the conceptual framework of video learning based on CBE and POPBL in PTV (see Figure 1.0).

Characteristics of CBE

(Hall & Jones, 1996; Mansfield, 1989; Minghat, at al., 2013; Mukhtar & Ahmad, 2013; Mulcahy, 2000; Norton, 1985; Stanly Elam, 1971; The National Council on Technical and Vocational Education and Training, 2006; Tuxworth, 2005; William, 1997; Wolfm 2005)

1. Students undergo a training program or competency that focuses on knowledge and job specifications as well as skills that are based on standard industry and employer competency where its success is recognized.
2. Various methods and materials are used.
3. Materials, space and equipment are sufficient and complete in order to give students the required experience.
4. Instructor provides a learning environment that resembles the work environment.
5. Students are informed of the competence criteria and attitude in workplace as well as the role given before the students follows the model. Prerequisite information and directions are provided with the module. Competencies that must be achieved are identified, validated and disseminated beforehand.
6. Students follow the modules individually and rely on the level of competence and capabilities without any limitation of time to achieve various competencies levels and values. They will be assessed individually. Trainees can enhance their capability by demonstrating their achievements that have been acquired.
7. Instructors promptly correcting students' mistake and provide immediate feedback on assignments and tests given during T&L.
8. The criteria that are used in the evaluation of performance and assessments methods should be clearly stated and disseminated prior assessment. Evaluation criteria based on competencies shown by students are evaluated in terms of performance (knowledge), capability (ability to perform the task) as well as attitude and requires proof to determine the level of mastery. Assessment takes place during T&L process and refers to all prescribed standards or criteria. Ratings involved are pre-assessment and post-assessment.
9. It is a systematic program where teaching facilitates the development and evaluation of specific competencies.
10. Modules follow the syllabus.
11. Knowledge and understanding were gained through certain experiences that allow students to quickly master and relate their learning to the objectives.
12. Instructors give simple and complete instructions to help students to master and achieve the skills required.
13. Student-centered and teacher acts as facilitator.
14. Learning programs are prepared for individual development and evaluation of each competency is identified.
15. It is mastery learning where there is no provision of learning time to have a variety of competencies levels and values. When students master a job competently, then only they will be allowed to perform the next task.
16. Instructors will provide tasks that resembles real world of workplace to be completed by the students before they are given the next task.
17. Learning activities are graded to help some of the students to have at least a minimum level of competency.

Characteristics of POPBL

(Kruger-Basener & Kosuch, 2009; Minghat, et al., 2013; Moesby, 2005; Ruhizan et al., 2011; Uziak, at al., 2010)

1. Design or project-based and problem-based.
2. Students design and develop knowledge from projects and problems synthesis.
3. Student-centered and the teacher acts as a facilitator or project director.
4. Teaching provision is based on skills required.
5. Process-centered.
6. Group-centered. Strong group planning which is led by individuals who are experienced according to levels.
7. Experience-based.
8. Problems are made as the core of learning. Students engage with complex issues and require them to identify information that needs to be learned and the skills needed to solve the problem.
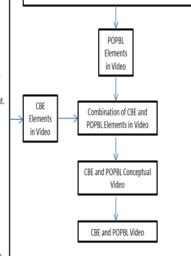9. Evaluating problems according to stages.

POPBL Elements in Video

CBE Elements in Video

Combination of CBE and POPBL Elements in Video

CBE and POPBL Conceptual Video

CBE and POPBL Video

Figure 1.1: Conceptual Framework of video learning based on CBE and POPBL in PTV

CONCLUSION

Realizing that these learning problems have yet to have solid solutions, researchers have conducted studies on the elements that are necessary in the production of video-based learning in TVE based on CBE and POPBL. Researchers have chosen video as the medium to develop students' competencies as it have been proven by other resaerchers that the use of multimedia is effective in attracting students' interests and motivation in learning. Unfortunately, existing medium did not help much in shaping students to be competent and it is not very suitable to be used in TVE. Therefore, the conceptual framework of video-based learning based on CBE and POPBL was built and will be tested by experts for further research.

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