Characteristics of Video Learning Based on Competency Based Education (CBE)

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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 practice and stimulate students' ability to get engaged in T&L. This should be added to the Competency-based Education (CBE) because the concept of learning is suitable for learning base on performance and establish the characteristics of the competencies required by employers. Therefore, this study was undertaken to identify the characteristics of video learning base on competency-based education. This characteristic was built based on the analysis results of previous study and expert interview in Malaysia.

Keywords
CBE; Video; Characteristic; Learning; Lompetency

Introduction

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 and his colleagues (2010) CBE did not emphasize on time-based training and it promises accountability, flexibility and student-centeredness. CBE was 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).

In addition, 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 (The National Council on Technical and Vocational Education and Training, 2006). Besides that, according to Norton (1985) and Kandar and Dahar (Kandar & Dahar, 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 (Mulcahy, 2000; Tuxworth, 2005). CBE also stated that prerequisite information and directions need to be provided together with the module (Dahar, et al, 2013; 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). Furthermore, CBE is an alternative to meet current needs and not just looking at individual result-driven achievements only (Kandar & Dahar, 2006). Assessments involved in CBE are pre assessment and post assessment (Dahar, et al., 2013; Marina & Jamil, 2013; 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 facilitator and promote lifelong learning (Dahar, et al., 2013; Marina & Jamil, 2013). In addition, this program provides sufficient and complete equipment to provide experience to students. 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 (Dahar, et al., 2013; The National Council on Technical and Vocational Education and Training, 2006).

Competency-based Education (CBE) is very effective to be used in education as it aims in training individuals of the skills related to workplace (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, et al., 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 (Dahar, et al., 2013).

The use of technology in education offers huge potential (Ebrahimi & Jiar, 2018) as it introduces an innovative teaching and learning modalities among students with different backgrounds (Hernández-Ramos, 2007; Sampson & Fytros, 2008). 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 video also has shown that it has helped educators in the T&L process, helped students improve their understanding in mastering a subject (Ismail, et al., 2006; 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 Kearney and Schuck (2004), 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 national 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 (Potter, 2005). 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 (Abdul Rahim & Hayazi, 2010). According to them, if learning is done by using video, it is expected that teachers to be ready to integrate information and communication technologies in the T&L process (Ebrahimi, 2013). In addition, preliminary studies conducted in a vocational training center previously has shown that students participated 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 characteristics of video learning base on CBE for TVE.

Methodology

To develop a CBE-based video learning for Technical and Vocational Education (TVE), researchers need to identify the characteristics of CBE in the video. For that purpose, researchers have conducted structured interviews with six CBE experts in Malaysia. Experts involved in this research have teaching experiences in technical and education more than ten years, involved in NOSS. The experts involved in this study were individuals who acquired teaching experience in TVE more than 10 years, engaging in the development of NOSS and were involved in CBE-related publications. The study took almost six months. The study involved only 6 experts after obtaining saturated data (Brannen & Corn, 2005; Back, 2010; Bryman, 2012). Before the actual interviews were conducted, structured interview transcripts were confirmed in advanced by two lecturers from Universiti Teknologi Malaysia (UTM).

Next, pilot interviews were conducted to identify if there are any weaknesses to the interview transcripts. Once improvements were made, actual interviews were carried out.

The raw data from the interviews were recorded, compiled, analyzed and interpreted to make it meaningful. The data were processed using ATLAS.ti software. Data were analyzed through three procedures which were reduction, verification and presentation of data (Miles & Huberman, 1994). In reducing the data taken from the interviews session, the researchers needed to read the transcript of the interviews several times, select and summarize data that were meaningful to the study. Data were classified into meaningful units called 'segmenting' while data that did not give any significance was left out.

Results and Discussion

Once all the data were transcribed, the researchers used a coding system based on the recommendations made by Marohaini (2001). Fixing a code for each transcript and segment is important to facilitate the process of retrieving the original data and to ease cross-referencing of information when writing and reporting (Marohaini, 2001). Next, the researchers have verified the interview data to ensure the validity and reliability of the findings of the interview data. The verification process was performed by obtaining index inter-rater realiability towards the code and the unit using Kappa Agreement values (Cohen's Kappa). The formula for finding the coefficients of the agreement is as in Figure 1.

$$K=(fo-fc) / (N-fc)$$

Where,

K= *A Coefficient of Agreement*
fo= the number of units in which the judges agreed
fc= the number of units for which agreement is expected by chance
N= the number of the units coded

Figure 1. Formula For Cohen‟s Kappa

According to Marohaini (2001), the reliability of qualitative data can be achieved if the resulting transcripts were reviewed by a panel of judges consisting of at least two independent and credible researchers. Therefore, researchers chose two Competency Base Education (CBE) experts and formula (Rust & Cooil, 1994) as shown in Table 1. Approval of experts in Kappa agreement values is very important in determining the reliability of the themes developed by the researcher. Both experts were provided with a copy of the guidelines and suffiecient code schedules. Both agreed in understanding the code and the purpose of the theme (Marohaini, 2001).

Table 1. Kappa Agreement Value Scale (Rust & Cooil, 1994)

Kappa (K)	Strenght of aggrement
K<0.00	Very weak
0.00<K<0.20	Weak
0.21<K<0.40	Moderately weak
0.41<K<0.60	Moderate
0.61<K<0.80	Good
0.81<K	Very good

In this study, the approval of the two CBE experts was obtained from the results of their evaluation of 60 units for CBE. After two evaluators gave their approval, the calculation process was carried out and the agreement value between the inter raters was 0.92. The value belonged to a very good level in the reliability scale for CBE based on Table 1 (Rust & Cooil, 1994). The process of obtaining the Kappa agreement value is shown in Table 2.

Table 2. The Calculation of Kappa Coeffiecient Agreement Value between POPBL Experts

Kappa Agreement Value Coefficient Expert 1	**Kappa Agreement Value Coefficient Expert 2**	**Total Kappa Agreement Value Coefficient Average**
fa=57	fa=58	
fc=30	fc=30	
N=60	N=60	
K=(fa-fc) / (N-fc)	K=(fa-fc) / (N-fc)	
K=(57-30)/(60-30)	K=(58-30)/(60-30)	K=(0.90+0.93)/2
K=0.90	K=0.93	K=0.92

Therefore, the reliability of coding in this study is quite high. This further indicates the high reliability for each unit that is used to describe a theme. Finally, the data obtained from the interviews should be displayed. According to Miles and Huberman (1994), there is no specific format for reporting qualitative data research. Therefore, researchers have compiled the interviews data in the form of construct arrangement which was obtained with its respective unit.

Based on Table 3, the constructs built for CBE element consists of four constructs, namely video quality, delivery instruction in video, video design and learning content. For the first construct which is video quality, there are two sub-constructs. Interface has four elements and audio has five elements. The second construct is delivery instruction in video which has six elements. The third construct is video design that has four sub-constructs. Principles has six elements, presentation has four elements, presenter has two elements and the fourth sub-construct is the motivation construct that has three elements. Last construct or the fourth construct has nine sub-constructs which are introduction of the video which has five elements, motivation has one element, work flow has ten elements, variety of examples has two elements, realistic has one element, rubric has four elements, equipment has four elements, and enrichment and evaluation have three elements respectively. The construct of learning content consists of six sub-constructs being identified as the ideal component that are complied with CBE characteristics where one of the sub-construct is pinciple.

Table 3. CBE Elements in Video

No.	**Construct**		**CBE Elements in Video**
1.	Video quality	Interface	Attractive in terms of the interface
			Apply dynamic multimedia elements (text, audio, video and animation)
			Clear display
			Has high resolution
		Audio	Has clear audio
			Has smooth audio
			The audio has commercial value
			Has appropriate music suitable to the learning topics
			Sound and motion of video goes along
2.	Instuction Delivery in Video		Assignments or work process in the video is complete
			Assignments or work process displayed are gradual
			Displays actual T&Lprocess
			Displays animation that support the assignment or work process
			Explantion is assisted with slides in video
			Video segments ranging from simple to difficult
3.	Video Design	Principles	Focuses on skills

			Video content has elements that can enhance one‟s cognitive
			Video content has elements that can improve one‟s behavior
			Video content has elements that can improve one‟s psychomotor
			Has induction set in video
			Has questioning components
		Presentation	Has consistency in every segment display
			Use of software video
			Tasks shown in the video are labeled
			Has zoom in techniques (focus) on matters assessed
		Presenter	Has graphics text to support questions raised by the presenter
			Presenter is competent
		Motivation	Video applies the element of motivation by showing a green light when the student successfully perform a task
			Video applies the element of motivation by making a sound 'try again' when there are errors
			Video applies the element of motivation by showing the percentage of achievement for the work completed
4.	Learning content	Introduction of Video	Stated the tasks that will be carried out to students
			States related learning theory that will be presented at the beginning of the video
			States the basic needs at the beginning of the video
			States learning objectives
			States introduction for each segment
		Motivation	Displays testimonies of successful individuals
		Work flow	Displays segment of comparison between the results of work that meets the criteria with work that does not meet the criteria
			Displays work activities according to the National Occupational Standard (NOSS)
			Displays comparison of real work of actual situation with situation in the workshop
			Shows errors done when tasks are executed
			Displays matter that is formed (yield) and followed by the process of formulating the matter
			Shows the impact of the offense committed while performing tasks
			Shows comparative segment between competent students with those who are not
			Shows complete work process, level by level based on the prescribed work activities
			Provide problem-based solutions related to the matters delivered
			Displays conducive, attractive and neat working space
		Variety of examples	Displays variety of examples
			Multiple methods of doing certain tasks or work processes
		Realistics	Clearly display the actual scenario
		Rubric	Shows rubric skills required in early stage of T&L
			Shows rubric skills required at the end of T&L
			Shows a section of a minimum level of skills to be mastered students
			States rubric skills that students have to acquire 80% prior to training
		Equipment	Display the same current technology used in the industry
			Equipment used by the presenter is the latest
			Demonstrate the use of the equipment that is easy to operate
			Demonstrate the use of equipment that can provide immediate results
		Enhancement	Flashback important things that students need to know
			Video shows replication of work flow that indicates mistake made
			Shows alternative answers and state the correct answer
		Evaluation	Reiterating aspects assessed for each task level by level
			Shows a checklist for students to see their level of mastery
			Questions asked via video consists of a simple, medium and difficult questions

Conclusion

Recognizing these learning problems, many researchers have been conducting reserach on the elements that are essential in the production of CBE instructional video in Technical and Vocational Education (TVE). Researchers chose video as a medium to develop students' competence as it has been proven from previous research that multimedia is able to attract students‟ interest and it is very effective. Unfortunately, current medium does not help much in shaping students‟ compentencies and is not suitable to be used in TVE. Therefore, the characteristics of CBE video learning was developed to serve as a reference in the construction of a video that emphasizes skills and become an instrument for assessing existing videos that possess skill-based learning content. From this research, researcher had derived four constructs namely video quality, delivery instruction in video, video design, and learning

content. The construct of video design and learning content in this study were designed with regard to the characteristics of CBE and were confirmed by experts thorough validation process. Meanwhile, the construct for video quality and delivery instruction in this study are suitable to be implemented in Technical and Vocational Education.

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