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Categorisation of Video Lecture Designs in MOOC for Technical and Vocational Education and Training Educators

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Abstract: Video lectures are the main content delivery mechanism in Massive Open Online Course (MOOC). It is used frequently in many MOOCs. This has resulted in the creation of many video lecture designs. Scholars agree that noticing the design is significant for both educators and learners. Thus, this study aims to investigate the designs of Malaysian Technical and Vocational Education and Training (TVET) video lectures in MOOC. Using video lectures (N=15) collected from MOOC in TVET discipline, analysis was done by comparing the video lectures with Crook and Schofield's video lecture design taxonomy. It was found that Malaysian TVET video lectures can be categorized into six different designs. Voice over slides was the most frequent design used. From the six designs, three new ones were found from the video lectures. Hence, the findings of this study may be beneficial for both TVET educators and students when engaging with video lectures.

Keywords: Video learning, video design, TVET, MOOC, education technology

1. Introduction

Technical and Vocational Education and Training or also known as TVET is an emerging discipline in Malaysia. It involves the acquisition of knowledge and skills for the world of work. According to Yusoff, Salam, Mohamad and Daud (2017), the development of TVET in Malaysia started in 1964 with the establishment of two public institutions and has since grew with the involvement of almost 500 public institutions.

Just like any other disciplines in Malaysia, TVET is also embracing the use of technology in the field of education. One such technology is Massive Open Online Course (MOOC). MOOCs are open courses offered online by higher learning institutions. Today, MOOC has about 60 million users around the world (Shah, 2018). Currently, according to Ismail, Hamzah, Ariffin, Ismail, Mat Daud, Khairul, Utami and Khairudin (2018), many TVET educators and learners have started to use MOOC in the process of teaching and learning. They added that MOOC's multimodality and modern features have attracted many TVET educators to create their own MOOC.

Central to MOOC is the usage of video by students. Chauhan and Goel (2015) indicated that video is the main mechanism of content delivery in MOOC. Video is a multimodal mechanism where it combines text, audio and video into one package. Literature search suggested that this kind of video is labeled with many names. One of it is video lectures. Tomakhiv (2016, p. 80) defined video lectures as "methods that provide any learning experience that are mediated by the use of streaming or video technologies, either online or asynchronously". Usually the video lectures are embedded into MOOC with the purpose of teaching and disseminating information.

The ubiquitous status of video lectures in MOOC has resulted in the creation of many video designs. Chorianpoulos and Giannakos (2013) explained that video lecture design ranges from a simple static recording to highly elaborated post-production videos. It all depends on the resources available and skills possess by the developers.

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Crook and Schofield (2017) suggested that it is important to recognize the design of video lectures. This is because it helps educators to differentiate between the traditional lectures with video lectures. Traditional lectures primarily refer to classroom lectures or also known as offline lectures. On the other hand, video lectures are lectures delivered through the combination of various features such as video, audio, and animation. Crook and Schofield (2017) Further explained that educators need to understand the difference because it can significantly affect students' psychology and learning. The same design is not suitable for both classroom and video lectures. The same idea was echoed by Guo, Kim and Rubin (2014) when they mentioned that video lecture design and style can affect the engagement of students. For instance, it is reported that video lecture that has more personal feel is found as more engaging than highly usage of recording technology. Another example as reported by Guo et al. (2014), video lectures that feature the instructor and slides are more engaging than slides alone. Based on the report, it shows that different video design affect students differently especially in term of their engagement.

The need to study the video lectures design is rooted from the ubiquitous status of video lectures especially in the world of education (Chauhan & Goel, 2015). This phenomenon effects many disciplines including TVET. This can be seen through various creation of MOOCs on TVET that utilize video lectures. Furthermore, as suggested by Guo et al. (2014), the design of video lectures can affect students' engagement that can influence their academic achievement. Therefore, by investigating the TVET video lecture designs in MOOC, it will benefit both TVET students and instructors to use video lectures effectively. Thus, this study aims to analyze and classify the design of Malaysian TVET video lectures. To be specific the study seeks to answer these two questions:

(a) What are the video lecture designs used to create Malaysia TVET video lectures?
(b) What are the most common and least common designs used to create Malaysian TVET video lectures?

2. Literature review

There is a consensus among scholars that, there need to be a uniformed taxonomy for video lectures to group them into similar style and design (Crook & Schofield, 2017; Chorianopoulos, 2018). This is because the wide usage of video lectures has created many video lecture designs and styles. Each design and style consist of different modality and is considered as different from the other. A taxonomy of video lecture designs would allow for fair and consistent studies on video lectures (Chorianopoulos, 2018). In addition, by having the taxonomy, there will be a reference for possible future design of video lectures. Video lectures will be developed continuously as lecturers and instructors continue to tinker around with ideas and technology (Chorianopoulos, 2018). For instance, future design might be the combination of two or more video lecture designs.

Guo et al. (2014) conducted a study on video lecture styles and its effects towards learning. Their corpus was collected from EdX, an online learning platform. The platform offers more than 1900 online courses from higher learning institutions around the globe including top institutions such as Harvard and Massachusetts Institute of Technology (MIT). All video lectures belong to the same discipline, which is science and engineering. Guo et al. (2014) study identified six basic video lecture styles namely:

- Classroom lecture with instructor on the blackboard
- Talking head of instructor at desk
- Digital drawing board
- Slide presentation
- Studio without audience
- Computer coding session

Additionally, Tomakhiv (2016) conducted a study with similar aim, which is to investigate the design and format of video lectures. The corpus used was 30 English video lectures from various platforms namely FutureLearn, Coursera, EdX, Open Yale Courses and OpenLearning. He found two main designs of video lectures, which are presentation and e-lecture proper. Presentation is video lecture that consists of notes or slides accompanied by commentaries from the tutor. On the other hand, e-lecture proper is video lectures created specifically for virtual domain such as MOOC platform.

Another study on video lecture designs is by Crook and Schofield (2017). They analysed 50 video lectures collected from both social science and science and technology disciplines. They reported that there are 16 designs commonly used in making video lectures. The designs were suggested by comparing its features with traditional lectures. Table 1 provides explanation of the video lecture designs by Crook and Schofield (2017).

A more recent study was conducted by Chorianpoulos (2018). He surveyed the literature on video lecture designs in order to categorise the video lectures according to its features. He took notice of many previous researches on video lecture designs and came up with two main themes: instructional media and human embodiment. Instructional media includes videos of slides, animation and board. Human embodiment on the other hand refers to videos that include the presence of tutor, animated human or talking-head.

3. Methodology

3.1 Corpus selection

The corpus for this study was obtained from Openlearning platform. Openlearning is one of the platforms that offers MOOCs for users around the world. To be specific, the video lectures were obtained from UiTM MOOC in Openlearning. The selection of video lectures was based on the following criteria: 1) the purpose of the video lectures is to impart knowledge or to teach. 2) the video lectures are focusing on technical or vocational subjects such as engineering and production technology. 3) the video lectures are freely available to the public. It is acknowledged that the data is quite restricted and should be regarded as a pilot study which requires further investigation and discussion in order to generalise the findings.

Table 1 - Description of video lecture designs (Crook and Schofield, 2017:59-60).

A1 Voice over slides: A sequence of slides is narrated by a hidden voice.	**A2 Voice over screencast:** A record of continuous screen recording (as opposed to discrete and static slides) is narrated by a hidden voice.	**A3 Writing over slides:** Narrated slides include superimposed the narrator's writing. Graphic annotation is added to one or more static images, implicitly by the speaker.	**A4 Kahn whiteboard:** Narrated whiteboard includes manual acts of superimposed writing.4 This is similar to A3, except that speaker's hand is made visible as they perform the annotation, thereby conveying a stronger sense of agency.
B1 Fixed frame outside: Video narrator in a window fixed adjacent to a slide sequence. The first of four formats that explore picture-in picture presence of the lecturer. These may each vary in size but are generally small, typically occupying 20% of screen space.	**B2 Mobile frame outside:** Video narrator in a window in various positions adjacent to the sequence of background presentation activity.	**B3 Fixed but overlapping:** Video narrator at fixed position but overlapping the background sequence rather than being a framed picture in picture.	**B4 Mobile frame and overlapping:** Video narrator is now framed, but presented at varying positions in the background sequence
C1 Presence in split screen: Video narrator and slide sequence are presented simultaneously and in adjacent frames.	**C2 Presence in picture:** Video narrator is visually integrated with slide images as if standing in front of a display surface.	**C3 Presence overlapped by content**: Symbolic material is superimposed on a video narrator.	
D1 Presence active on whiteboard: Narrator moves in front of content and acts upon it but visual presence overlaps a full-screen presentation surface.	**D2 Presence in lecture:** Direct recording of narrator in traditional lecture context. The continuity of speaker and display surface is broken, conveying an in-room sense of the two.	**D3 Presence in full screen:** Close up on a solitary narrator in local 'domestic' or topic-relevant context.	
E1 Presence in interview: recorded interview.	**E2 Presence in discourse:** recorded conversation. This and E1 correspond to more traditional 'talking	heads' formats common in broadcast expositions.	

3.2 Analysis procedure

Based on the selection criteria, fifteen video lectures were collected from UiTM MOOC. Each video lecture was given a label for ease of reference and record. The video lectures were labelled L1 to L15. After the labelling process, the videos were watched in its entirety in order to determine the design. The styles and attributes of the video lectures were noted and compared to Crook and Schofield's (2017) taxonomy of video lecture designs. The taxonomy was chosen since it comes with screenshots and detailed explanation of video lectures designs. Thus, this will help the process of labelling the video lecture designs. Additionally, comparing the taxonomy to the designs suggested by Guo et al. (2014), Crook and Schofield's (2017) is seen as a more suitable and systematic taxonomy for this study.

Crook and Schofield (2017) cautioned that there can be more than one design in one video lecture. Thus, screenshots of the video lectures were taken when the presentation design changed. This can help the researchers to analyse the video lectures thoroughly.

The video lectures were analysed by two researchers in separation at first. Then the findings by the two researchers were compared. Difference in analysis was low but it was discussed and resolved carefully. Reliability of the analysis was not measured since the report of the findings does not emphasis on the frequency of occurrence of the video lecture designs. Instead, the findings emphasis on the video lecture designs that exist in the UiTM MOOC. The findings were then tabulated, and discussion was done by referring to related literatures.

4. Findings and discussion

Fifteen video lectures were analysed to determine its design. Crook and Schofield's (2017) category of video lecture designs was used as the reference. The results of analysis were as shown in Table 2.

Table 2 - TVET video lecture designs in MOOC.

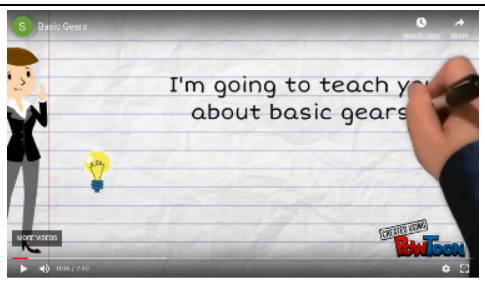
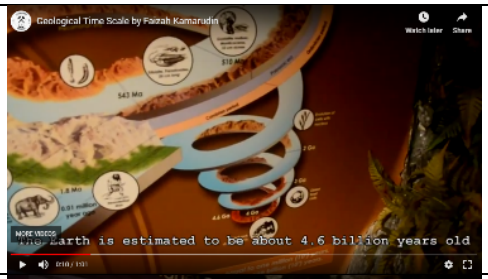
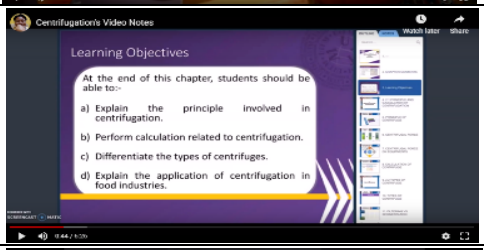
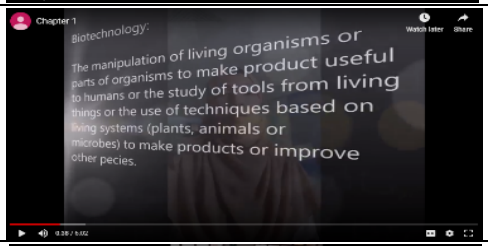
Lecture	Title	Type	Feature	
			Duration (minutes)	Note
L1	Basic gears	Animation	2.30	No voice
L2	Geological time scale	Writing over video	1.01	
L3	Physical layer of earth	Presence in full screen	1.35	
L4	Plate tectonics	Animation	2.05	No voice
L5	Volcanism process	Writing over video	2.11	
L6	Flow meter	Voice over slides	6.08	
L7	Introduction to biotechnology	Presence overlapped by content	6.02	
L8	Image quality of chest radiograph	Voice over slides	3.07	
L9	Systematic approach of chest radiograph interpretation	Voice over slides	6.36	
L10	Centrifugation	Presence in full screen	6.26	
L11	Classification of minerals	Voice over slides	5.05	
L12	Plane weakness	Voice over slides	1.04	
L13	Geological maps and interpretation	Voice over video+ Presence in full screen	2.40	
L14	Slake durability test	Voice over video+ Presence in full screen	3.41	
L15	Plane load test	Voice over video+ Presence in full screen	2.11	

Overall, there were six designs of video lectures found from the corpus. Most of the video lectures (six lectures or 40 percent) adopt the voice over slides design. Animation, writing over video, presence in full screen and voice over video plus presence in full screen were utilized by two videos each. The least used design was presence overlapped by content with just one video lecture.

Table 3 shows the screen shots of the six video lecture designs. The findings show that only limited designs were used to create the video lectures from the corpus. This further suggests that there are many other designs that can be used to make video lectures especially in TVET discipline. Consequently, the findings show that there are many rooms

for TVET instructors to create new video lectures using myriad of design in the future. Furthermore, as asserted by Chorianpoulos and Giannakos (2013) when they asserted that there is no single format to develop video lectures. Variables such as nature of content, technology availability and technical skills of developers determine the design of video lectures. The claim can be seen from the findings of this study as six designs were used to create the video lectures.

Table 3 - TVET video lecture designs screenshots.

Lecture	Title	Type
L1, L4		Animation
L2, L5		Writing over video
L3, L11		Presence in full screen
L6, L8, L9, L10, L12, L13		Voice over slides
L7		Presence overlapped by content
L14, L15		Voice over video + Presence in full screen

Three new designs emerged from the study namely animation, writing over video, and combination of voice over video plus presence in full screen. Two video lectures utilized animation where it substituted the presence of lecturers

with animation. There was also no voice presented in the videos. Teaching is done using written text embedded in the animation. Similarly, writing over video also utilizes written text to teach the students. The writing was embedded over videos related to the subjects. Lastly, voice over video plus presence in full screen is a combination between the design proposed in the taxonomy. The videos combined the presence of lecturer on screen with voice over videos related to the topic. This finding supported the suggestion by Chorianpoulos (2018) when he explained that the development of video lectures will continue as lecturers and instructors around the world continue to experiment with technology available. So, creation of new design in video lectures is expected.

In terms of duration, the shortest time recorded for the video lecture was 1.01 minute while the longest was 6.36 minutes. There is a consensus among scholars that video lectures should be presented in short segments (Guo et al., 2014; Soares, Lopes and Viera, 2015; Hansch et al., 2015; Buchner, 2018). As explain by Guo et al. (2014), short video lectures are more engaging than longer ones. They explained that short video lectures refer to videos that are shorter than six minutes. Additionally, on average, students can only concentrate more when watching short video lectures. Any longer than six minutes, many students will start to lose concentration and cannot really focus on the video lectures. This is also supported by Hansch et al. (2015), when they suggested that video lectures should be short and segmented to attract the students' attention.

5. Conclusion

This study aims to uncover the design of video lectures from technical background. The analysis revealed that there are six categories of design in the collected video lectures. The most common design is voice over slides while the least common is presence overlapped by content. In terms of the length of the video lectures, their duration ranges from 1.01 to 6.36 minutes.

It is hoped that these findings can facilitate many parties such as TVET educators and students in the process of teaching and learning. Students of TVET can benefit from the findings of this study by being informed of the available video lecture designs and its features. Thus, this can help them in dealing with video lectures. For instance, students who are watching video lecture with the design of voice over slides can expect that they will watch series of slides that contain important information while listening to a voice explaining the content. They would not be expecting the presence of the instructors in the video. Additionally, the TVET instructors can use the findings of this study to know the existing video lecture designs that could be accessed by the students. This can help the instructors to make informed decision in choosing the video lecture designs in order to create new video lectures in the future.

The study is only limited to Malaysian TVET MOOC video lectures from one institution. Thus, the findings of this study cannot be generalized to all TVET video lectures. It is acknowledged that there might be other designs that have been utilized in preparing TVET video lectures. thus, further researches are needed to get a wider view of this issue. For future research, it is recommended to use a bigger corpus to get the overall picture on this issue. Other than that, it is also recommended to look into the features used in the design to get an in depth understanding of Malaysian TVET video lectures.

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