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A Descriptive Analysis of the Implementation Video-Based Module to the Student through Active Learning in Project

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Abstract

Project development is a vital component contributing to the continuous assessment marks for some courses in Institutions of Higher Learning. This study was conducted to develop video-based modules to reference students during the development of the database project used as active learning in the classroom. Video-based modules are suitable for learning approaches toward students in Gen-Z. ADDIE model has been used for the video-based module development. The video module development consists of several phases that have been set according to the topic of database project development. This study involved 104 students in year two who will need to develop the database project individually. The results of the study found that the video-based module had a positive impact on the students. The descriptive analysis has shown that 101 (97.1%) students agreed that the video-based module produced is easier to understand. Meanwhile, 100 (96.2%) students found that this video-based module helps them complete the given project. This active learning approach can be used for other courses that involve project development and having a class with a large number of Gen-Z students.

Keywords: *Project Development, Active Learning, and Video-based Module.*

1. Introduction

Education plays a vital role in producing a generation that can meet the needs of today's industry. The 4.0 Industrial Revolution indirectly influenced and impacted the field of education. Education 4.0 is one of the consequences of the Industrial Revolution that is happening nowadays and will influence the teaching and learning methods (Shahrina et al., 2019). Institutions of higher learning are also affected by this educational revolution. In line with the revolution in education, teaching and learning methods also need to change. Traditional teaching and learning methods need to be changed to attract current Gene-Z students who are more vulnerable and inclined to use the latest technology.

There are two main objectives in this study. The first is to develop the video-based modules, and the second is to conduct a descriptive analysis to see students' responses to the video-based module developed. The learning sessions of some courses in Institutions of Higher Learning involve lectures, tutorials, laboratories, and assignments either in groups or individuals, such as project development. Individual project development is one of the components taken as a continuous assessment and is the final output of Advanced Database courses. Each of the students will be given different titles of the project, and there are six lab modules as a guideline in project development. The development of this project is split into three phases, according to the lab module. In phase 1 are a database development and system interface basics. Meanwhile, phase 2 is data entry and data manipulation, while phase 3 is

a transaction and software installation. Each phase is a combination of several laboratory modules. Students are given a certain period to complete each phase in project development.

The development process of this project is learned in each lab session using the modules provided. Previous lab sessions used the traditional method of using text-based modules, and the instructor will teach each instruction from the module in front of the class. This learning method creates a passive environment in the lab session. Based on observations, students are less focused on the explanation given by the instructor. Students are not interested in the text-based modules provided and are often left behind in the laboratory because they cannot follow the steps described by the instructor. Visual learning methods, the use of technology as a medium of interaction, and rapid knowledge transfer are among the new learning methods for Gen-Z students (Ruzzakiah et al., 2019). Text-based learning materials are less attractive to Gen-Z students than visual, infographic, and video-based teaching materials. Thus, the video-based lab module is the best alternative for Gen-Z students to strengthen their understanding and assist them in the given project assignments.

Active learning methods are suitable to be implemented for Gen-Z students. This method can attract their interest in the learning process. Lab sessions conducted using video-based modules create an active learning environment among students. The video-based module provided in advance makes it easier for students to try first on their own before attending the lab session. Students will actively interact with instructors and friends during the lab session if there is an unresolved problem. Students are encouraged to discuss with friends to get ideas and solutions to their problems. This method is appropriate for the characteristics of Gen-Z students who like independent and self-directed learning (Moore et al., 2017).

2. Current Work

2.1 Active Learning

Active learning is one of the learning methods that are suitable for current Gen-Z students. This learning method encourages students to be actively involved in the learning process and activities. Various activities in active learning methods can be done to encourage student involvement and participation in the learning process, such as engaging them with course material and enhancing their critical thinking as they make applications beyond the classroom (Lumpkin et al., 2015). Giannakos et al. (2016) also stated that active learning is a teaching model that focuses on students' learning responsibilities. Meanwhile, according to Brame, C. (2016), students involved in building and enhancing understanding and knowledge are also among the definitions of active learning. The activities may vary but require students to do higher-order thinking. According to Cattaneo, K.H (2017), one active learning style approach is project-based learning that focuses on students' main output, which is a project. Various learning techniques and tools that can be used to create active learning sessions, including discussion, reflection, problem-solving, using video, and so on, refer to the course requirement as well as the availability of the tools, software, and hardware. Implementing this active learning method is very suitable for classes with a large number of students because it helps in the teaching and learning process. A study from Aji et al. (2019) found an improvement in student academic performance as an effect of the implementation of active learning methods.

2.2 Video

Video is an audio-visual medium used as entertainment, marketing, information, music, and learning materials. Nowadays, learning videos have been widely produced in line with the development of educational technology. Teachers' teaching medium is often used by teachers in learning videos (Syamsulaini et al., 2016). Video-based learning is a method that has a very positive effect on students, especially Gen-Z students who were born and are in the age of the latest technology. Online encyclopedias, videos, and various internet resources are learning methods within technology preferred by Gen-Z students (Moore et al., 2017). They are a Generation that is very vulnerable to technology and gadgets. Ruzzakiah (2019) states that smartphone technology and social media are standard for the current Gen Z students and become the leading platform and an effective mobile

learning method. According to Cilliers (2017), the Gen-Z is surrounded by the virtual environment makes them consider that the learning and teaching environment is like in the virtual world. Therefore, they are less focused and quickly bored when learning sessions are traditionally implemented, especially when the learning materials used are text-based. The production of learning materials in the form of video aims to meet their needs, especially in terms of flexibility where they can watch the video using gadgets, anytime and anywhere. Using video as a learning method is very significant in the teaching and learning process (Syamsulaini et al., 2016). The use of video in learning has a positive impact and impact on students. Compared to traditional lecture-based teaching, students' performance improves with video-based teaching methods (Murthykumar et al., 2015). According to Syaripuddin et al. (2019), video is one of the media that becomes the best medium in the teaching process to deliver information to the students.

3. Methodology

The video-based module development process that has been done is guided by the ADDIE model introduced by Rossett (1987). ADDIE is commonly used to produce effective design and modules created using the ADDIE model suitable for use in any environment, either online or face to face (Nada Aldoobie, 2015). The ADDIE model has five main components in developing video-based modules: analysis, design, development, implementation, and evaluation. Figure 1 shows the ADDIE module used in video-based module development.

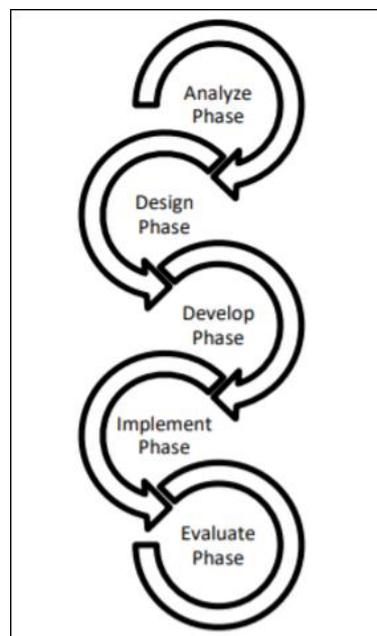


Figure 1: ADDIE Model

(Source: Development of massive open online course (MOOC) based on Addie model for catering courses, 2018)

Video-based modules are produced based on six existing text-based modules, and each of the lab modules is divided into 2 to 4 video modules. Brame (2016) explains that the learning video produced should be short and the display time less than six minutes so that students tend to watch the entire video and maximize students' attention to the video. Video-based modules are produced using Camtasia software and uploaded on the open learning platform (MOOC). The video-based module is uploaded phase by phase and a week before the lab session begins. Students attend laboratory sessions according to schedule and use the video-based module as the lab session's learning material that helps develop the project. Each lab session will be monitored by an instructor who will help if students do not understand or cannot solve the problem.

Figure 2 shows the implementation process of using video-based modules to help strengthen students' understanding of self-laboratory sessions and assist in developing a given database project. Each lab session will work on Lab Module 1 that has been split into several videos module. Each video-based module is produced according to the topics for database project development.

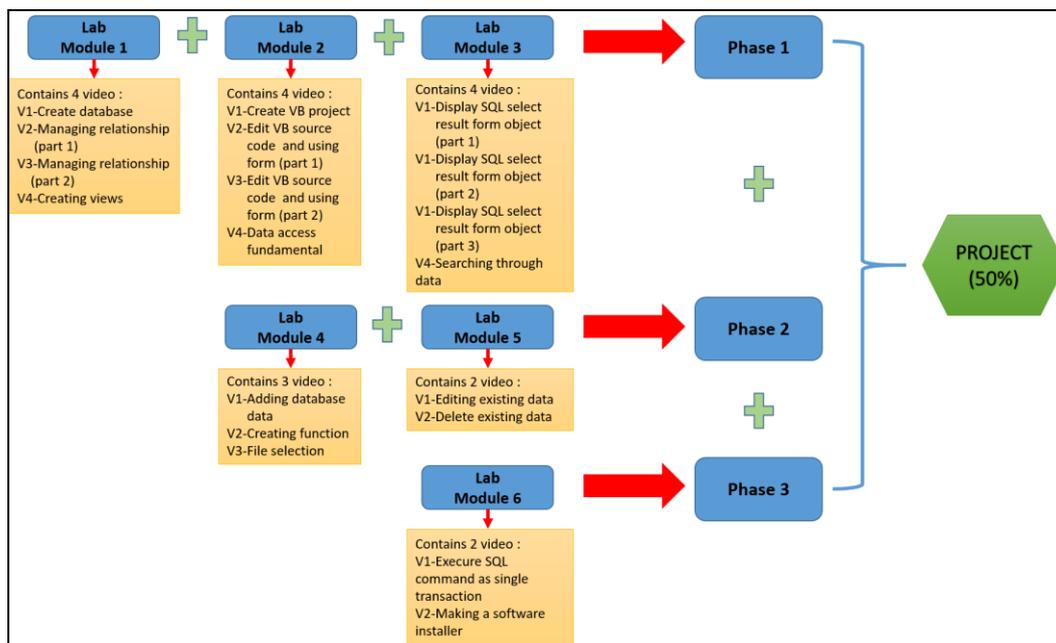


Figure 2: Implementation of a video-based module for advanced database project development

Based on the diagram above, students need to complete the project according to the phases set. Phase 1 of the project development results from a combination of Lab Module 1, Lab Module 2, and Lab Module 3 lab, which covers the topic of database development and system interface basics. Phase 2 of the project development results from a combination of Lab Module 4 and Lab Module 5, which covers the topics of data entry and data manipulation. Phase 3 is the result of Lab Module 6, which is the topic of transactions and software installation. The combination of these three phases will result in the final project of the advanced database.

Figure 3 shows the previous text-based lab module's appearance, and Figure 4 shows a video-based module that has been developed based on the text-based module. Several video-based modules were generated from each text-based lab module. This approach ensures that the display time for each video module developed is not too long and prevents students from losing focus.

PART 3: Editing Visual Basic Source Code and Using Form Events

A. Viewing VB Source Code

1. All user-editable visual basic source code is contained in the form that the code is written for. To view the source code, in the 'Solution Explorer' tab, right-click on the form 'frm_splashscreen_a123456.vb' and click 'View Code'.
2. Alternatively, you can click on the form name in the 'Solution Explorer' and press the 'F7' key on your keyboard.
3. The main window will switch to the source code in 'frm_splashscreen_a123456'. You will see the automatically generated 'code snippet' for this form as shown below:

```
Public Class frm_splashscreen_a123456  
End Class
```

INFO: This VB 'code snippet' represents the only user editable area of the VB source code in a particular form. It is not the only source code, as Visual Studio will automatically generate other source code for controlling the Windows form display and other programming artefacts. Users are advised to edit source code only in these VB code snippets, and not alter any of the automatically generated code. Alteration of any of the automatically generated code will cause code corruption, which is usually irreversible. The only way to recover from the code corruption is to delete the entire form and restart from the beginning.

B. Automatically Generating Code Snippets for Form Object Events

1. Visual Basic code is normally executed during 'Form Events' or 'Object Events'. An 'Event' is an 'activity', 'action' or 'time' that will trigger the execution of user-entered code.
2. Double clicking on any form object while in the form design window will automatically generate the code snippet for the object's default event.
3. The default event for the 'Form' object, is the 'Form_Load' event. To generate its code snippet, switch to the form design window, and double click on any empty area of the 'frm_splashscreen_a123456' form. The following code will be automatically added:

Figure 3: Text-based lab module

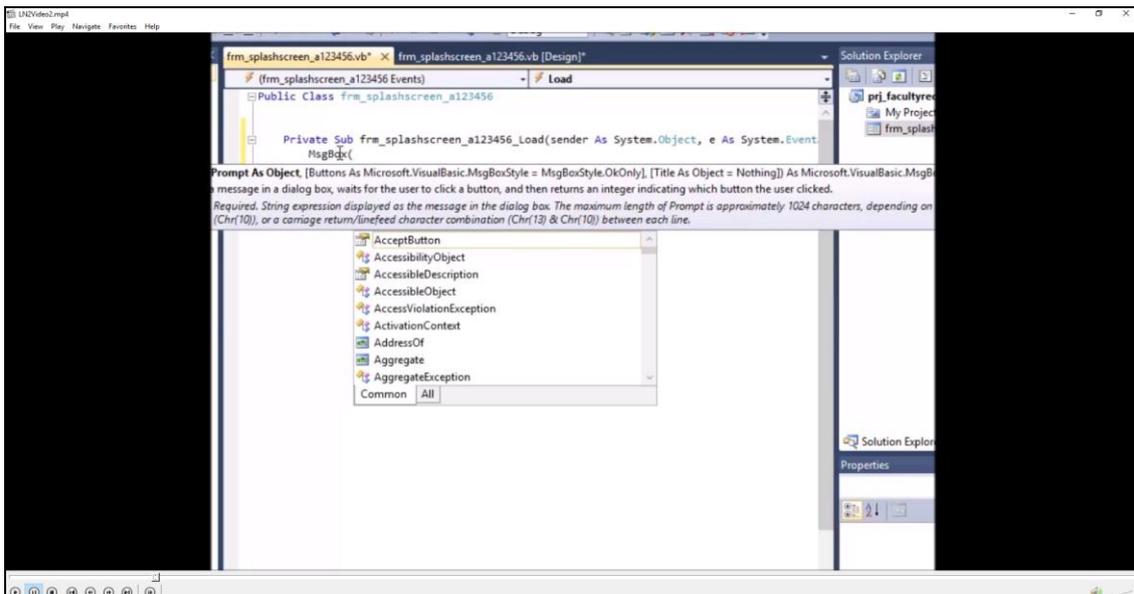


Figure 4: Video-based Module

Figure 5 shows the video-based module that has been uploaded on the open learning platform (MOOC) according to the lab module. Each module video will be published according to the time and date set into stages.

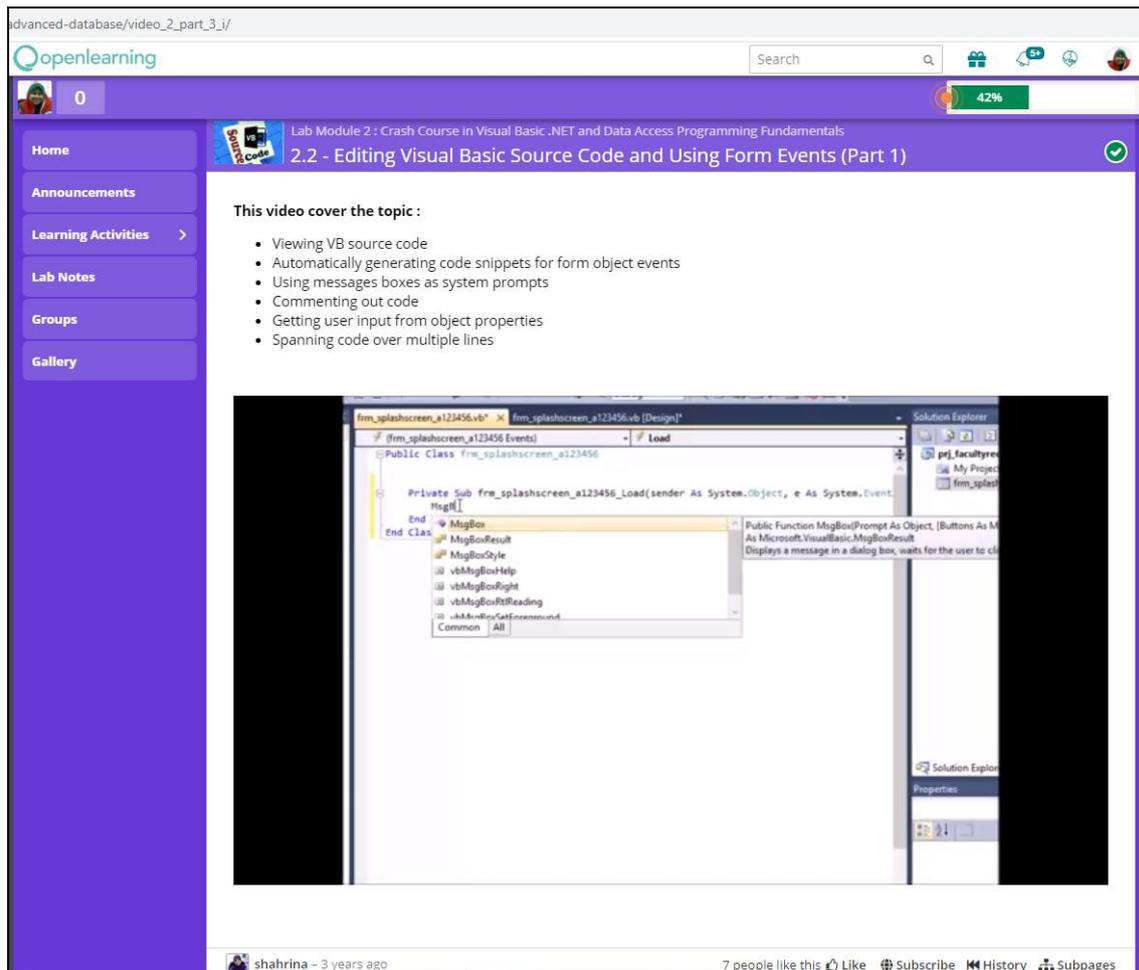


Figure 5: Video-based module uploaded in the MOOC platform

4. Result

The descriptive analysis in this context, focusing on the year two students from the Faculty of Information Science and Technology, University Kebangsaan Malaysia. The result cannot be generalized to the whole population of students in Malaysia. However, the analysis result is a good indicator of understanding video acceptance among the undergraduates' students in Malaysia. The targeted response for this analysis focusing on year two students who registered for the advanced database subject.

This study focused on 104 Year 2 students who need to develop projects individually to meet the Advanced Database course requirements. Questionnaires were given to students to get feedback on the effectiveness of the video-based modules as teaching materials that can help in project development and obtain feedback related to the content of the video-based module produced.

4.1 Demographic Analysis

Based on Figure 6, from 104 respondents, 60.6% of them are female, and 39.4% are male. The result showed that probably due to the higher number of females than male students in this faculty's general population.

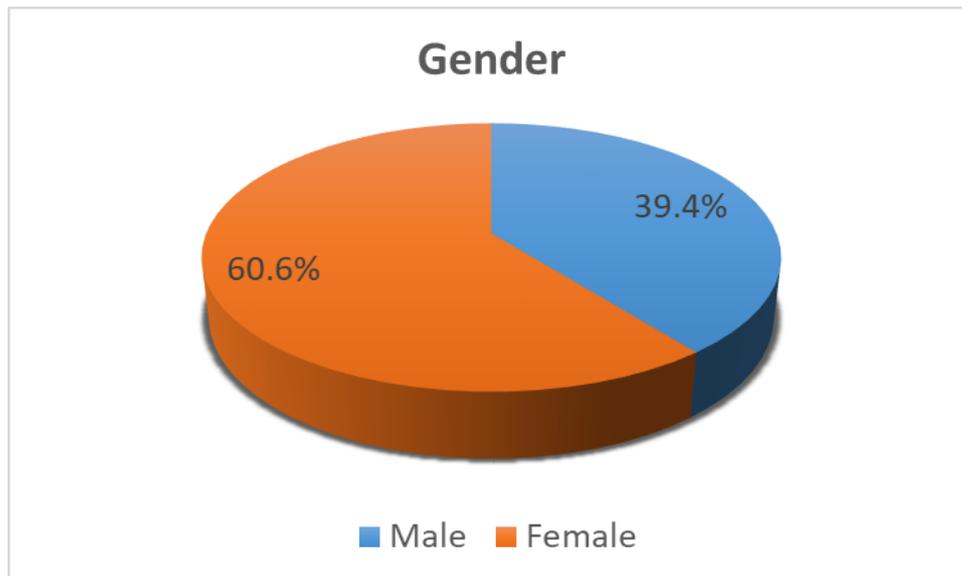


Figure 6: Percentage of respondents according to Gender

4.2 Content of the video-based module

Figure 7 shows a total of 101 (97.1%) students agreed that the video-based module produced is easier to understand than the text-based module. The result had shown that Gen-Z students are easier to understand and focus on visual-based material. The video content includes the time limit for the video display. The video-based module produced meets the specifications in terms of time in line with the study conducted by Brame (2016), who explained that the learning video developed must be short and have a display time of fewer than 6 minutes to ensure students can focus on the video. Besides the time limit, a clear video display is also one of the influencing factors in ensuring that the module's content can be seen clearly by students. The production of some critical steps will be zoomed in to make it more visible and understandable to the students. This video-based module allows students to repeatedly try each problematic step and indirectly improve student understanding in each process.

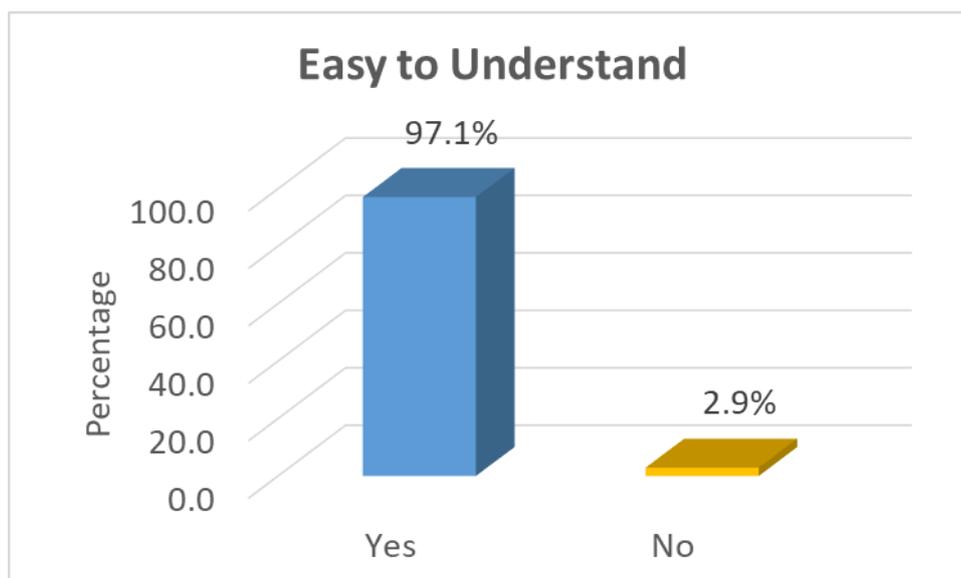


Figure 7: Percentage of respondents according to their feedback of the video-based module content

4.3 Effectiveness of video-based module

Meanwhile, based on figure 8, 100 (96.2%) students found that this video-based module helps them complete the given project. Each project development step shown in the video-based module helps

and facilitates the development of the student project. Video-based modules are divided according to specific topics based on existing text-based modules on small topics from the module's main topic. This method has a perfect effect on student understanding. It is more effective in helping students develop a given project assignment because they can focus on one topic at one time. As a result, students can complete and produce projects on time.

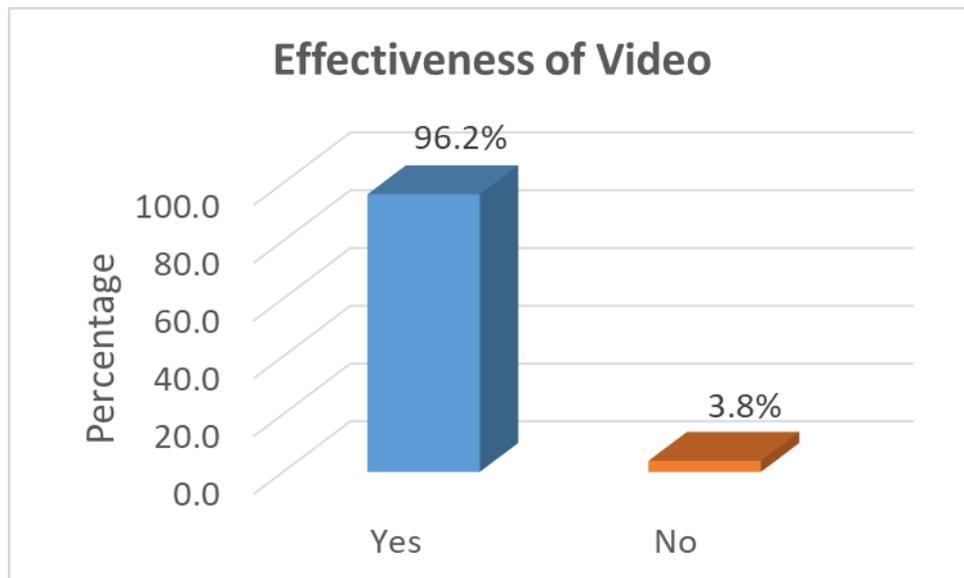


Figure 8: Percentage of respondents according to their feedback on the effectiveness of the video-based module

Based on the analysis results, the video-based module produced has had a positive impact on students. The content of the video-based module is easier to understand compared to the previous text-based laboratory module.

5. Future Work

From the analysis result, the video-based module has an impact on students' project development. According to Azniza et al. (2017), learning videos increase students' understanding of some challenging topics and significantly impact student achievement. This active learning approach can be used for other courses involved in project development and having a class with many Gen Z students. It is hoped that further studies can be continued by studying the relationship and the impact of the video-based module on student performance and achievement in this course.

6. Conclusion

There are several limitations to this study. This study has a limit of respondents consisting of only year two UKM students only. This study also focuses on specific courses only, which is an advanced database. However, this study found that the video-based module helped students complete advanced database projects individually. Students can learn and understand the project development processes using the video-based module provided. The video-based module has positive effects and impact on the students. Video content is one of the best learning materials suitable for Gen-Z students. The video-based module helps in the teaching and learning activities of laboratory sessions involving many students. Laboratory sessions have been implemented in an active learning environment. This situation indirectly helps students think more creatively, increase self-confidence, and improve students' communication skills.

References

- Aji, C.A. and Khan, M.J. (2019). The Impact of Active Learning on Students' Academic Performance. *Open Journal of Social Sciences*, 7, 204-211.
- Brame, C. (2016). Active learning. Vanderbilt University Center for Teaching, from <https://cft.vanderbilt.edu/active-learning/>
- Brame, C. J. (2016). Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. *CBE-Life Sciences Education*. 15(6): 1-6.
- Cattaneo, K. H. (2017). Telling active learning pedagogies apart: From theory to practice. *Journal of New Approaches in Educational Research (NAER Journal)*, 6(2), 144-152.
- Cilliers, E. J. (2017). The Challenge of Teaching Generation Z. *PEOPLE: International Journal of Social Science* 3: 188-198.
- Giannakos, M.N., Krogstie, J. & Aalberg, T. (2016). Video-based learning ecosystem to support active learning: application to an introductory computer science course. *Smart Learn. Environ.* 3, 11.
- Ismail, M. E., Utami, P., Ismail, I. M., Hamzah, N., & Harun, H. (2018). Development of massive open online course (MOOC) based on addie model for catering courses. *Jurnal Pendidikan Vokasi*, 8(2), 184-192.
- Lumpkin, A., Achen, R. M., & Dodd, R. K. (2015). Student perceptions of active learning. *College Student Journal*, 49(1), 121-133.
- Murthykumar, K., Veeraiyan, D. N., & Prasad, P. (2015). Impact of video-based learning on the performance of postgraduate students in biostatistics: A retrospective study. *Journal of clinical and diagnostic research: JCDR*, 9(12), ZC51.
- Moore, K., C. Jones & R. S. Frazier. (2017). Engineering Education for Generation Z. *American Journal of Engineering Education* 8: 111-126.
- Nada Aldoobie. (2015). ADDIE Model. *American International Journal of Contemporary Research*, Vol. 5, No. 6.
- Ruzzakiah Jenal, Ang Mei Choo & Amelia Natasya Abdul Wahab. (2019). Implementasi MOOC terhadap Pembelajaran Matematik Diskret. *Teknologi Komputeran Generasi Z*. 83-96. Penerbit UKM.
- Rossett, A. (1987). Training needs assessment. Englewood Cliffs: Educational Technology Publications
- Shahrina Shahrani, Noor Faridatul Ainun Zainol, Masura Rahmat, Rohizah Abd Rahman & Azura Ishak. (2019). Pelaksanaan Model Fleks Sesi Makmal Pangkalan Data. *Teknologi Komputeran Generasi Z*. 67-82. Penerbit UKM.
- Syamsulaini, S., & Mashitoh, H. (2016). Pengajaran berasaskan video dalam pembelajaran berpusatkan pelajar: analisis dan kajian kritikal. *Journal of ICT in Education*, 3, 24-33.

Syaripuddin, R., Ahmad, A.R., & Awang, M.M. (2019). The Use of Video in Teaching and Learning 21st Century History Education in Malaysia. In N. Noordin, & N. Ngadnon (Eds.), *Sustainable Development and Societal Wellbeing in The Current Technological Era* (pp. 182 - 186). Padang: Redwhite Pres.

Zainul, A., Malik, A. A., & Basharudin, N. A. (2017). Keberkesanan Penggunaan Video Pembelajaran Interaktif Untuk Kursus Embedded System Application. *National Innovation and Invention Competition Through Exhibition*.