Research and Innovation in Technical and Vocational Education and Training Vol. 2 No. 2 (2022) 269-281 © Universiti Tun Hussein Onn Malaysia Publisher's Office





Homepage: http://publisher.uthm.edu.my/proceeding/index.php/ritvet e-ISSN: 2785-8138

# Development of an Educational Video of Air Conditioning Workshop Practice using the YouTube Platform

# Siti Nurulhuda Hamzah<sup>1</sup>, Faizal Amin Nur Yunus<sup>1\*</sup>, Nizamuddin Razali<sup>1</sup>, Mohd Bekri Rahim<sup>1</sup>, Khairul Anuar Abdul Rahman<sup>1</sup>

<sup>1</sup>Faculty of Technical and Vocational Education, University Tun Hussein Onn Malaysia, Batu Pahat, 86400, MALAYSIA

\*Corresponding Author Designation

DOI: https://doi.org/10.30880/ritvet.2022.02.030 Received 25 April 2022; Accepted 07 September 2022; Available online 30 September 2022

Abstract: This study is about the development of an Educational Video of Air Conditioning Workshop Practice using the YouTube platform. The production process of this development of Educational Video of Air Conditioning Workshop Practice using the YouTube platform is important to meet the needs of educational facilitators in the process of learning and teaching in the classroom. The purpose of the study was to design and develop an educational video of Air Conditioning Workshop Practice using a YouTube platform that is more interesting and effective for air-conditioning and refrigeration students. The ADDIE model which consists of five phases namely analysis, design, development, implementation, and testing is used as a guide in the development of this product. The sample of analysis from the questionnaire is tested on BBG cohorts 1-8 to analyse the functionality of the educational video of Air Conditioning Workshop Practice using the YouTube platform. The results of the analysis show that all the respondent is very agreed with the design, content, language, and function of the Educational Video of Air Conditioning Workshop Practice using the YouTube platform. It is hoped that this Educational Video of Air Conditioning Workshop Practice using the YouTube platform can help to facilitate education in the process of learning and teaching in the classroom. The development of digital media for learning such as video could improve the current practice of skills training in the field of TVET.

Keywords: Air Conditioning, Workshop Practice, Educational Video, ADDIE

# 1. Introduction

The Malaysian Education Development Plan (Higher Education) provides a major Technical Vocational Education & Training (TVET) higher education to enhance skills to meet industry demands and increase opportunities for career advancement. TVET program enrollment will grow significantly

through collaboration with the industry to ensure supply meets demand (Ministry of Education Malaysia, 2015)

To achieve this, the ministry will intensify cooperation and industry involvement, improve coordination with various TVET provider agencies and enhance branding. Key initiatives include involving the industry to co-design and implement curricula through new collaboration models and enhance the quality of delivery through apprenticeship programs, hands-on training, simulations, and specialised training to improve coordination with various TVET provider agencies to reduce duplication. Programs and resource optimisation enable specialization in areas of expertise and increase cost efficiency (Ministry of Education Malaysia, 2015).

According to Faizal et al. (2017), a country's future success depends on the success of institutions capable of producing a moral, knowledgeable, and skilled generation. TVET consists of full-time technical and vocational education, training, and lifelong learning offered to individuals from all walks of life. According to Som at el. (2022), TVET is intended to provide employment opportunities and contribute to the growth or improvement of the national economy. TVET is a pathway to produce highly skilled, knowledgeable, innovative, and able to face competition and risks at the global and regional levels in line with current needs while placing the country on a strong performance for development and improving the quality of education in the future.

Furthermore, teachers also act as facilitators in the effective teaching and learning process to develop students' potential. One of the ways emphasised in teaching and learning to develop students' potential comprehensively and effectively is using Teaching Aids (ABBM) during teaching and learning sessions. Accordingly, in theoretical learning, the level of understanding includes the description of concepts and discussions in the classroom. Teachers must use various teaching techniques when explaining concepts and conveying information so that students are interested in the concepts taught (Ibrahim, Surif & Mustapa 2006). The field of TVET learning is basic knowledge-based (theory) skills (practical) learning. Meanwhile, skills are knowledge acquired by students and applied through hands-on activities, which in turn trigger minds-on thinking (Ibrahim, Surif & Mustapa 2006). Practical training is a formal and systematic modification of behaviour through learning, which occurs due to education, instruction, development, and planned experience (Armstrong, 2003).

Along with efforts to develop the potential of TVET, learning theory alone is not enough for an individual to become competent or proficient in hands-on skills. In general, most of the practicalities in the real world of work are different from the theory studied. According to an interview conducted with the Head of the Hospitality Department, Pasir Gudang Polytechnic, the industry demand for skilled manpower nowadays is not only for students who master the theory alone but for students who have more practical mastery of the work. This will make a person seen as a leader when able to form people skilled in his job. Furthermore, to empower TVET, the delivery of co-curricular input must be varied with the latest teaching and learning techniques by developing information technology. One way is through e-learning as a teaching aid tool.

According to Dalgarno (2001) the learning and learning process can be improved in quality and diversified delivery and reception through several techniques such as computer-assisted software, through network systems, software and databases or information or internet systems, software, and database data. In addition, these teaching aids can increase interest and stimulate students' minds in this cyber age and have been used and recognised as a catalyst for the teaching and learning process. In conclusion, the existing ABB can be improved by producing learning videos to have highly skilled, knowledgeable, and innovative human capital in line with current needs in TVET.

Existing ABBM problems need to be highlighted in finding solutions in this study. The first problem, the ABBM problem, does not suit students' learning style, which varies according to their ability level. Mohamad Levy (2008) stated that the curriculum formulated by the government is the

same. Still, the content is different based on the level of ability, learning style and interests of other children.

Orhun (2007) defines learning style as an individual's gathering information and subsequently processing the data obtained. In addition, learning style also, according to Orhun (2007), is the formation of ideas, problem solving, attitudes and interests. Each student's learning style is different in learning something. Students' differences are defined in experience, interests, inclinations, achievements, and ways of understanding. Thus, these students have their learning style to receive and respond to and use stimuli in the learning process. Therefore, these students need an ABBM to understand each student's learning styles. The learning video will be able to help these students understand learning by following their learning styles.

According to Felder and Spurlin (2005), students in engineering, need to master skills in addition to understanding theory to ensure that graduates are born able to practice what they learn can be applied to the real world of work. It is difficult for students to master skills in engineering due to inefficient learning processes. According to Siti Aloyah (2002), there is also a study that found that there are students who are only observers and not directly involved in practical activities carried out. It is clear here that students need to master the skills in addition to understanding the theory so that it can be applied to the real world of work. In addition, students need to engage in practical activities and not just be observers during the practical conducted in the workshop. Therefore, having a learning video developed according to the subject's objectives will help students master the theory and practice easily. Next will make them interested in actively engaging in practical activities.

Next, various teaching aid methods, such as demonstration or demonstration, practical, project, simulation, lecture, drill, and discussion, are commonly used. Through the results of interviews with the instructors of the Air Conditioning Practice Workshop subject, the researcher found that this subject uses many demonstrations and practical methods to impart knowledge to students. According to Faizal et al (2017), practical methods can be defined as a pair, or a small group of students being provided with tools to carry out practical work. Teachers who use this method act as facilitators. Students will carry out practical work while teachers only play the role of observers and guides.

However, there are still shortcomings in such practical learning methods. According to Pyatt and Sims (2007), students are not given freedom in most practical activities. They are not allowed to deviate from established procedures to minimize waste of time, injury, material damage and wastage of materials. Therefore, students cannot master learning well due to the limitations set by the instructor. Thus, the development of learning videos can give freedom of time to students and reduce the risk of damage and waste of materials. Next, e-learning is an instructional model in which instructors, students and subject matter can be anywhere, allowing teaching and learning to take place regardless of time and location (Hussein, 2017). The e-learning method in training is not meant to replace the traditional training methods of the past completely. Practical training, such as using certain tools and machines, still requires traditional methods. These two methods are seen as complementary to each other.

The blended solution, which combines the positives of both traditional and electronic training methods, is seen to drive the economy and productivity of a country, organization, and industry in a better and more competitive direction (Aguti, Wills, & Walters, 2014). Therefore, students will be more proficient in the studied subjects when practising e-learning. Thus, the development of learning videos using the YouTube platform is a good endeavour with the application of learning can be in any location that allows teaching and learning to take place regardless of time and location.

Finally, the issue of students having financial problems where they must buy reference books. The implications of this problem can cause students to become lazy and not interested in learning. Therefore, the absence of reference books will cause students to be distracted, such as a lack of focus on education. Using reference books or textbooks is very important, especially in learning sessions, because the

absence of reference books will cause learning disruption (Elmes & Smith, 2001). Therefore, the development of learning videos using the YouTube platform will help students who lack money to buy reference books or textbooks because YouTube is free. The purpose of the study was to design and develop an educational video of Air Conditioning Workshop Practice using YouTube platform that is more interesting and effective for air-conditioning and refrigeration students.

## 2. Methodology

The methodology is a technique and method often used to achieve the study's objectives. The design of this study is product development using the ADDIE model as development guidelines. The development process of this product is based on 5 phases outlined through the ADDIE Model.

#### 2.1 Analyses

This phase is to identify the problem researcher wants to solve. Researchers used the preliminary survey method by conducting informal interviews with BBG lecturers on Air Conditioning workshop practice to gather information on the problems encountered. In addition, researchers collect information through reading materials, surfing the internet and observing existing educational tool ABBM. Researchers have found information on problems with the existing educational tool ABBM by interviewing lecturers and observation. The findings show the need to improve the current educational tool ABBM in Air Conditioning and refrigeration subjects by using the latest technology.

#### 2.2 Design

This phase is a phase where the educational video is based on the analysis that the researcher has performed. Based on the findings in the analysis phase, the researcher focuses on designing storyboards to produce educational videos of Air Conditioning Workshop Practice using the YouTube platform. It aims to avoid any mistakes in the development phase. Researchers care about important factors such as functionality and development that the researcher can implement. This phase is done by drawing a storyboard to be developed. The result of the design storyboard in video development is shown in Figure 1, 2, 3, 4, 5, 6, 7 and 8.



Figure 1: Welcome to AIR CONDITIONING Workshop



Figure 2: Talkative slide



Figure 3: Rest time 5 minutes



Figure 4: Continues talkative slide



Figure 5: Scan QR code Telegram

**REVISION SLOT** 

(QR CODE)

Figure 6: Scan QR code revision



Figure 7: Scan QR code tutorial



Figure 8: End of video

#### 2.3 Development

In this phase, the researcher develops an educational video based on a storyboard. The video is produced by referring to Guidelines for the design of instructional videos for software training and adapted from Van der Meij and Van der Meij (2013) and Time duration by Obsidian.

#### 2.4 Implementation

The implementation phase is to test the product in aspects of functionality educational video of Air Conditioning Workshop Practice using the YouTube platform. Researchers inspect the product with two lecturers of air-conditioning and refrigeration in Faculty Technical Vocational Education (FPTV) and one expert from Collage Vocational Kulim to evaluate the functionality of the educational video before testing the sample. The expert recommendation must be considered to improve the product before trying the sample.

#### 2.5 Evaluation

In the evaluation phase of this product, the researcher used a google form distributed to 38 students in the field of air-conditioning and refrigeration. The questionnaire has aspects of design (17 items), content (8 items), video (5 items), language and functionality of the product (11 items). The result from the analysis was used to evaluate how far the functionality of the Air Conditioning Workshop Practice educational video is using the YouTube platform in an aspect of design, content, language, and function.

#### 3. Results and Discussion

Questionnaire analysis was done to determine the functionality of the educational video Air Conditioning w shop practice using the YouTube platform. Sections B, C, D, and E of the questionnaire are about video evaluation in terms of design, content, language, and functionality. Data were analysed using a mean score scale.

Item	Statements / Questions	Mean
B1	Interesting video colour scheme	4.45
B2	Attractive video interface	4.34
B3	Attractive video display screen design	4.39
B4	Video screenshots can increase interest	4.21
B5	Attractive video background colour	4.10
B6	Video presentations display a clear and effective arrangement	4.37
	of text	
B7	The size of the text in the video is attractive	4.42
<b>B</b> 8	Appropriate selection of background music	4.37
B9	The audio sound in the video is clear	4.08
B10	The use of graphics in videos is interesting	4.42
B11	QR Code can be scanned well	4.26
B12	The training elements provided can help students understand	4.42
	the topic	
B13	The practical shown are easy to follow	4.39
B14	The danger warning display in the video is effective	4.58
B15	Automatic link to next video on YouTube related to the topic	4.36
B16	The list of playlists on YouTube is organized	4.58
B17	Attractive Air Conditioning Workshop logo	4.58
	Average mean	4.37

#### Table 1: Part B video design analysis

Table 1 shows the conclusion of the overall mean for instructional video design involving items B1 to B17 is 4.3731, where the mean score scale in the mean score scale category on scale 3.67 to 5.00 means strongly agree. Therefore, attractive video colour scheme items, attractive video interface, attractive video display screen design, the video screen display can increase interest, attractive video background colour, video presentation display clear and effective text arrangement, the text size in the attractive video, selection of appropriate background music, clear audio in the video, use of graphics in the interesting video, QR Code can be scanned well, training elements provided can help students understand the topic, practical demonstrated easy to follow, effective danger warning display in the video, automatic links next video on YouTube related to the topic, the playlist list on YouTube is organised, and the attractive Air Conditioning Workshop Practice learning video using YouTube platform.

Item	Statements / Questions	Mean
C1	The delivery of learning content is easy to follow	4.53
C2	The title of the study is clearly stated	4.13
C3	The video content meets the learning objectives	4.50
C4	The order of the video content is orderly	4.63
C5	This instructional video provides credible facts	4.34
C6	This instructional video is suitable for a variety of learning styles	4.47
C7	The notes provided aid in teaching and learning	4.34
C8	The activities provided are suitable for use during the teaching and	4.57
	learning process	
	Average mean	4.44

Table 2 shows the conclusion of the overall mean for instructional video content involving items C1 to C8 is 4.4408, where the mean score scale in the mean score scale category on the scale of 3.67 to 5.00 means strongly agree. Therefore, the presentation items of the learning content are easy to

follow the learning title is clearly stated, the video content meets the learning objectives, the arrangement of the video content is orderly, this teaching video provides reliable facts, this teaching video is suitable for a variety of learning styles, notes provided to assist teaching and learning and the activities provided are ideal for use when the teaching and learning process is adopted for the development of Air Conditioning Practice Workshop learning videos using the YouTube platform.

Item	Statements / Questions	Mean
D1	The language used in the video is easy to understand	4.63
D2	The use of bilingualism in the text facilitates comprehension	4.34
D3	The terms used in the teaching are precise	4.42
D4	The spoken language of the instructor in the video is easy to follow	4.63
D5	The explanation by the instructor is clear and orderly	4.57
	Average mean	4.52

Table 3: Part D video langua	ige analysis
------------------------------	--------------

Table 3 shows the conclusion of the overall mean for instructional video language involving items D1 to D5 is 4.5211, where the mean score scale in the mean score scale category on scale 3.67 to 5.00 means strongly agree. Therefore, the language items used in the video are easy to understand, the use of bilingualism in the text facilitates comprehension, the terms used in the teaching are precise, the spoken language of the instructor in the video is easy to follow, and the description by the instructor is clear and orderly is adopted for video development Air Conditioning Workshop Practice learning using YouTube platform.

Table 4:	Part E	video	functionality	analysis
----------	--------	-------	---------------	----------

Item	Statements / Questions	Mean
E1	Allow the process of discussion between students and lecturers to take	4.28
	place systematically	
E2	Can change students' attitudes based on the teaching videos displayed	4.26
E3	Can cultivate students' interest based on the teaching videos displayed	4.14
E4	Can enhance students' curiosity based on the teaching videos displayed	4.39
E5	Facilitate the teaching and learning process	4.63
E6	Save time preparing teaching and learning resources	4.52
E7	Save energy in the provision of teaching and learning resources	4.36
E8	Reduce expenses to acquire teaching and learning resources	4.78
E9	Changing consumers' views on using technology in education	4.26
E10	Assist the learning process independently	4.68
E11	It can be used during the teaching and learning process of practical	4.68
	classes	
	Average mean	4.46

Table 4 shows the conclusion of the overall mean for instructional video functionality involving items E1 to E11 is 4.4665, where the mean score scale in the mean score scale category on the scale of 3.67 to 5.00 means strongly agree. Therefore, the item allows the discussion process between students and lecturers to take place systematically, can change students 'attitudes based on the teaching videos displayed, can cultivate students' interest based on the teaching videos displayed, facilitate the teaching and learning process, save time preparing teaching and learning resources, save energy provision of teaching and learning resources, reduce expenditure to acquire teaching and learning resources, change users' views to use technology in education, assist the learning process independently and can be used when the teaching and learning process of practical classes are adopted for the development of learning videos Air Conditioning Workshop Practice using the YouTube platform.

Finally, in the comments and suggestions section, experts have given positive comments and suggestions for improvements to the product. Researchers have made improvements based on the suggestions provided. Table 5 contains comments and suggestions from experts.

Table 5: Expert comments and suggestions			
Expert		Comments and suggestions	
Expert 1	i.	The title BGG changed to BBG	
	ii.	The title in the video is moving too fast, so needs to static or slow down	
Expert 2	i.	Change the video information about flare nut and union	
	ii.	Can add content on gas welding in educational video	
	iii.	Overall, the educational video is okay	
Expert 3	i.	Congratulation finished the product development	
	ii.	This product will help educators in teaching air-conditioning student	

#### 4. Discussion

First, to answer the objective of designing a learning video for the Air Conditioning Practice Workshop, the researcher has developed a teaching video using the YouTube platform. Researchers chose the YouTube platform because YouTube is one of the most popular social networks among the global community. YouTube is no longer just used to share videos - personal videos, commercials and so on, even the social site YouTube has also been used as one of the learning mediums. The proof is that in 2009 and 2010, the social site YouTube was selected as the video-sharing site that received the most votes in 'The Emerging List of Top 100 Tools for Learning' (Chan, 2010).

The researcher chose video in R & D because video can be a very influential educational and motivational tool (Yunus et al., 2010). However, much of its strength lies not in the video itself but in the way the video is used. The video is not a target or an endpoint, but a means toward achieving learning objectives and goals. It is clear here that the design of the Air Conditioning Practice Workshop learning video uses the application of instructional videos using the YouTube platform because the video is a very influential educational and motivational tool. Second, to answer the objective of developing learning videos as ABBM in R&D, researchers have created instructional videos in the Air Conditioning Workshop Practice channel on the YouTube platform. Researchers have chosen the ADDIE model to make this product. The ADDIE model contains phases of analysis, design, development, implementation, and evaluation. The production of Air Conditioning Workshop Practice learning videos should also refer to the video design guidelines by Van der Meij and Van der Meij (2013). There are various challenges to developing this learning video. The first challenge is the analysis phase, where the researcher lacks up-to-date reference material. Therefore, the researcher used the experience and observations while facing internet problems in rural areas to be used as an analysis for existing ABBM problems. Using observation and experience, the researcher successfully identified the shortcomings and advantages of ABBM that can be applied in developing Air Conditioning Workshop Practice learning videos using the YouTube platform.

The researchers had difficulty preparing the storyboard because many things changed in the actual video editing. The storyboard is only an initial overview of the video journey. Still, in real life, there are some parts in the storyboard that cannot be done due to the time limitations of time, the duration of use of the workshop and the lack of materials. The challenge in the development phase is that the researcher needs to get the structure of the subject and ensure that the video content meets the subject's needs and the objectives of the Air Conditioning Workshop Practice subject. According to Alobaid (2020), the use of YouTube videos is indeed considered an effective learning aid. Still, care must be taken in selecting learning videos so that the video's content coincides with the learning needs and objectives. So, each video researcher needs to ensure that the video can achieve the subject's objectives,

as students will be able to read technical drawings after watching the learning video. Various elements must be added and emphasized in the video so students can read the technical drawings as in the learning objectives.

According to Yunus et al. (2010), video can be a very influential educational and motivational tool. However, much of its strength lies not in the video itself but in the way the video is used. The video is not a target or an endpoint, but a means toward achieving learning objectives and goals. Next, there are three main phases in video production, that need to be emphasized: pre-production, production, and post-production. In the pre-production of the instructional video in the shoot, after finishing making the storyboard. Student models for shooting were selected and recorded in the Air Conditioning workshop. The copper piping practice became a major topic in recording, guided by the instructions in the practical paper. All materials and equipment needed for the procedure are provided before the shooting work is done in the Air Conditioning workshop. Before starting the shooting, the researcher must ensure the model is ready and practice safety measures while in the workshop. Each step will be recorded until the completion of the practical.

These videos have been recorded and edited multiple times using the Inshot and Canva.com apps before uploading to YouTube. Not to forget, the researcher needs to generate a QR code in each video for students to scan the screen and then be able to access folders that contain teaching notes, assignments, and practical reports. Challenges in the implementation phase, researchers need to seek expert opinion. For the questionnaire, the researcher needs to obtain the validity of the content and the validity of the face of the instrument. If there are grammatical errors on the questionnaire, the researcher must correct the mistakes before distributing them to the sample. Then, the researcher needs to get an expert opinion on the video produced. Finally, challenges in assessment occur when researchers want to analyze questionnaire answers. In the beginning, the researcher used a percentage and then converted the calculation to a meaningful scale to determine the acceptability of the learning video developed. To answer the objective of the learning video functionality of the Air Conditioning Practice Workshop using the YouTube platform in terms of design, content, language and functionality, the researcher analyzed the questionnaire from the sample using a mean score scale.

As a result of the findings, the training items provided can help students understand that the topics and practical shown are easy to follow. According to Elissavet and Economides (2003), teaching methods through multimedia applications which offer interactive and adaptive teaching and learning styles can address various difficulties in understanding theoretical knowledge and practical skills in the topic of learning. The change in learning techniques from static text reading to dynamic learning through elements such as audio, graphics, video, and animation that support the learning facts is believed to create a more interesting and effective R & D environment. The results of the questionnaire conducted, video presentation items display a clear and effective text arrangement, the text size in the interesting video in the video, danger warning display in the effective video, automatic link next video on YouTube related to the topic, playlist list on YouTube arranged and logo The Air Conditioning Workshop practice attracts BBG students to follow the learning sessions because it is easier and faster. Aris et al. (2006), stated that an important guideline that needs to be emphasized on the use of text in multimedia applications is that the text used should be concise and compact, with appropriate typefaces and fonts, consistent and easy to read and appropriate selection in terms of style and colour so that information can be conveyed easily, smoothly, and effectively.

Furthermore, the findings of the content section of the Air Conditioning Workshop Practice learning video can facilitate the R&D process. Learning content delivery items are easy to follow, learning topics are clearly stated, video content meets learning objectives, video content arrangement is orderly, this instructional video provides reliable facts, this instructional video is appropriate for a variety of learning styles, and notes are provided to help teaching and learning and activities provided are suitable for use

when the teaching and learning process is adopted for the development of learning videos Air Conditioning Workshop Practice using the YouTube platform.

Therefore, the learning video content item is suitable to be applied in the Air Conditioning Practice Workshop learning video to increase students' understanding, provide various learning styles, and raise the learning spirit of BBG students. Whereas the results of the language items used in the video are easy to understand, the use of bilingualism in the text facilitates comprehension, the terms used in the teaching are accurate, the spoken language of the instructor in the video is easy to follow, and the description by the instructor is clear and orderly is adopted for the development of Air Conditioning Practice Workshop learning videos using YouTube platform.

Aris (2006) stated that the screen is attractive, interactive, has a consistent arrangement and coincides with the theme of the title discussed can facilitate users to browse the software while increasing user interest and understanding of the information presented. It can be summarized here, that the application of multimedia elements in the design, video content and learning video language for Air Conditioning Workshop Practice facilitates students use learning videos while increasing users' interest and understanding of the information presented.

Lastly, the findings on the functionality of the learning video using the YouTube platform. Results of the items allow the discussion process between students and lecturers to take place systematically, can change students 'attitudes based on the teaching videos displayed, can cultivate students' interest based on the teaching videos displayed and facilitate the teaching and learning process. This is also supported by Watkins, Leigh, and Triner (2004), the readiness of adult students who are working on electronic training and learning methods emphasizes several key components in determining the level of readiness, namely access to technology, information and communication skills, motivation, discussion through online, the use of audio and video as well as the emphasis for successful e-learning. Thus, functionality items must be implemented in the YouTube platform to increase the effectiveness of R&D, especially in relating the theory and practice of the subject of Air Conditioning Workshop Practice. In addition, the results of the analysis found that the acceptance of strongly agreed item can save time in the preparation of teaching and learning resources, save energy in the preparation of teaching and learning resources as well as things reduce expenditure to obtain teaching and learning resources among BBG students. In today's digital age, media content is no longer just tied to one form of format. Therefore, it is certain that BBG students will not feel burdened to buy expensive reference books because the development of Workshop Practice learning videos uses the YouTube platform, which is more economical, cheaper and can be accessed anywhere.

#### 4. Conclusion

Learning through video learning is something that is not unfamiliar to us. Researchers have tested the functionality of the Air Conditioning Practice Workshop learning video using the YouTube platform in terms of design, content, language, and functionality. In general, the results of the analysis of BBG students who have been exposed to learning through video learning based on constructivism theory found that it can facilitate the teaching and learning process, enhance students' curiosity based on the teaching video displayed, the delivery of learning content is easy to follow, this teaching video is suitable for diversity learning style, can cultivate students interest based on the teaching videos displayed and reduce the expense of acquiring teaching and learning resources. Therefore, this learning video is an interesting alternative and suitable for use by BBG students in learning the subject of Air Conditioning Workshop Practice. Interaction also plays an important role. Discussion among students and with support and guidance by the instructor can help students build knowledge. Besides that, the development of digital media for learning, such as video, could improve the current practice of skills training in the field of TVET.

#### Acknowledgement

The author would like to express appreciation to the Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia.

## References

- Aris, B., Ahmad, M. H., Shiong, K. B., Ali, M. B., Harun, J., & Tasir, Z. (2006). Learning "goal programming" using an interactive multimedia courseware: design factors and students' preferences. Learning.
- Aguti, B., Wills, G. B., & Walters, R. J. (2014, November). An evaluation of the factors that impact on the effectiveness of blended e-learning within universities. In International conference on information society (i-Society 2014) (pp. 117-121). IEEE.
- Alobaid, A. (2020). Smart multimedia learning of ICT: role and impact on language learners' writing fluency—YouTube online English learning resources as an example. Smart Learning Environments, 7(1), 1-30.
- Armstrong, J. (2003). Making reliable distributed systems in the presence of software errors (Doctoral dissertation).
- Chan, Y. M. (2010). Video instructions as support for beyond classroom learning. Procedia-Social and Behavioral Sciences, 9, 1313-1318.
- Dalgarno, B. (2001). Interpretations of constructivism and consequences for computer assisted learning. British Journal of Educational Technology, 32(2), 183-194.
- Elmes, M., & Smith, C. (2001). Moved by the spirit: Contextualizing workplace empowerment in American spiritual ideals. The Journal of Applied Behavioral Science, 37(1), 33-50.
- Elissavet, G., & Economides, A. A. (2003). An evaluation instrument for hypermedia courseware. Journal of Educational Technology & Society, 6(2), 31-44.
- Faizal, A. N. Y., Saiful, H. M., Bekri, R., Jamil, A. B., Amiruddin, M. H., Ruhizan, M. Y., & Arasinah, K. (2017). Impact of work environment on learning transfer of skills. Pertanika-Soc Sci Humanit, 254(8), 33-40.
- Felder, R. M., & Spurlin, J. (2005). Applications, reliability, and validity of the index of learning styles. International journal of engineering education, 21(1), 103-112.
- Hussein, Z. (2017). Leading to intention: The role of attitude in relation to technology acceptance model in e-learning. Procedia Computer Science, 105, 159-164.
- Ibrahim, N. H., Surif, J., & Mustapa, M. S. (2006). Kefahaman dan tahap amalan pembelajaran secara kontekstual di kalangan guru Sains luar bandar. Kertas Kerja JPPG2006. Eprints. utm. my/2230/1/4\_5. pdf.
- Levy, H. M. (2008). Meeting the needs of all students through differentiated instruction: Helping every child reach and exceed standards. The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 81(4), 161-164.

- Ministry of Education Malaysia (2015). Pelan Pembangunan Pendidikan Malaysia (Pendidikan Tinggi). Retrieved from Ringkasan Eksekutif PPPM, 2025.
- Orhun, N. (2007). An investigation into the mathematics achievement and attitude towards mathematics with respect to learning style according to gender. International Journal of Mathematical Education in Science and Technology, 38(3), 321-333.
- Pyatt, K., & Sims, R. (2007). Learner performance and attitudes in traditional versus simulated laboratory experiences. ICT: Providing choices for learners and learning. Proceedings ascilite Singapore, 870-879.
- Som, M. F. M., Fahmy-Abdullah, M., Rashid, U. K., & Rahim, M. B. (2022). Entrepreneurship training model for competency-based training (CBT) concept at skills training centre in Malaysia. International Journal of Health Sciences, (II), 12001-12013.
- Siti Aloyah, A. (2002). Penilaian pelaksanaan program PEKA biologi. (Unpublished master's thesis). Universiti Kebangsaan Malaysia, Bangi, Selangor.
- van der Meij, H., & van der Meij, J. (2013). Eight guidelines for the design of instructional videos for software training. Technical communication, 60(3), 205-228.
- Watkins, R., Leigh, D., & Triner, D. (2004). Assessing readiness for e-learning. Performance Improvement Quarterly, 17(4), 66-79.
- Yunus, M. M., Hashim, H., Embi, M. A., & Lubis, M. A. (2010). The utilization of ICT in the teaching and learning of English: 'Tell Me More'. Procedia-Social and Behavioral Sciences, 9, 685-691.