

# EDUCATIONAL VIDEOS FOR LEARNING DIGITAL ILLUSTRATION CONCEPT FOR UNIVERSITY STUDENT

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## **ABSTRACT**

*To assist learning, preparation of suitable learning material is recommended along with a blended learning approach. Educational videos could be considered as a tool that can be adapted. This study aimed to develop educational videos for three (3) selected topics in Digital Illustration course offered to First-Year Multimedia undergraduate students. ADDIE instructional design model was used to develop those educational videos. This study started with choosing a topic, designing storyboards, developing videos, uploading prototype videos to Google Drive for evaluation purposes, and conducting a usability evaluation on selected respondents. Finding from the user testing showed it was ascertained that the students agreed to use videos to enhance their understanding in selected topics in the Digital Illustration course. There should be continuous improvement in the educational videos specifically in including additional content to further enhance the videos.*

## **KEYWORDS**

*Educational video, ADDIE instructional design model, guided learning, learning material, university student.*

## **1. INTRODUCTION**

For multimedia background students, understanding key concept of multimedia elements is a must. Knowledge of digital illustration delivered to university students in a selected higher education institution (HEI) is very abstract, as it is an understandable theory to be read, yet hard to digest in practice if there is no guided learning applied. Digital Illustration course is a major course in the first semester for students registered in the Degree of Multimedia Education program; it is also offered as a minor course for those registered as Multimedia minor program students in their third semester in the mentioned HEI. Those students came from various academic backgrounds, namely Matriculation Certificate, Diploma or Malaysia Education High Certificate leavers, which led to different levels of understanding that influenced the course's performance. The teaching of the Digital Illustration course includes both theory and practical work, which is conducted in a limited time, usually 14 weeks with three contact hours per week. Thus, those students from various background require further guidance in order to achieve the two (2) main learning objectives in the course. The objectives are to understand the fundamentals and principles of graphic design in creating artwork or graphic designs, as well as to apply media and tools in creating innovative, quality, and interesting ideas.

To create an enjoyable learning environment, it is important to have various combinations of digital content, platforms, tools, tasks, and interface and interaction design in supporting teaching and learning [1]. Videos can create class engagement and productive time for students who can use this tool to create videos to explain content or vocabulary of certain lesson. The popularity of Web 2.0 technology in education has introduced new modes of teaching, which are assisted by the global penetration rates of mobile devices. Besides that, the learning ecosystem in the Industry 4.0 era demands educators to connect and embed a dynamic learning environment. To the extent that users of current technologies are learners and teachers, [2] believed that any work that supports teaching and learning (T&L) can be considered *user-centred*. The creation of T&L material in a HEI is one of the approaches to assist lecturers in preparing suitable material to teach a specific topic. As stated by [3], T&L materials are the educational materials that are used within a lecture setting to support the learning objectives.

The objective of this study was to develop instructional material in the form of educational videos to assist in teaching certain chosen topics in the Digital Illustration course. In short, to prepare three (3) educational videos for three (3) different topics in the course. The selected topics were Introduction to Graphic, Graphics Elements, and Graphic Principle. These three (3) topics were casually explained in the form of videos using text, audio, and images. The topics chosen are the fundamental concepts of this course, which are emphasised to the new learners so that they can understand and apply these concepts in assignments and group projects given throughout the particular semester. The limitation of this study was that the developed educational videos were specifically for the Digital Illustration course taken by students majoring in the Multimedia Education Degree program and other students in related programs who chose Multimedia as their minor program in the selected HEI for this study.

The rest of the paper is structured as follows: first is a brief discussion on previous studies regarding the usage of educational videos in learning. Next, the authors will explain the phases in video development for the Digital Illustration course. This is followed with the results obtained after evaluating the educational videos with the targeted users. Finally, the paper is concluded with recommendations for future work.

## **2. LITERATURE REVIEW**

Currently, videos as a source of learning can be found all over the Internet which are easily accessed by anyone, especially teenagers and tertiary level learners. Some examples of websites that can be utilized by educators are video-based learning (VBL) resources, such as YouTube, Vimeo, and Netflix. Highlighted by [4], they believed VBL has expanded the education scope by becoming an enabler of flipped classroom initiative and allowing blended learning to take place particularly at college and university level. This is one of the reasons why VBL is applied in various T&L methods including flipped classrooms and Massive Open Online Course (MOOC). Learning using videos has become popular in line with the new generation of learning styles. The usage of videos (in this study, this refers to educational videos) is believed to support the concept formation of understanding which is strengthened thorough learning when used as T&L material in the lecture room. As stated by [5], teaching using videos helps educators to simplify teaching activities and at the same time motivate as well as attract students to learn. In addition, [6] believed that videos are an important part of higher education and serve as a foundation for many blended courses when integrated as part of the traditional courses.

Educational videos have been widely used in the T&L process and adapted to a variety of learning contexts. The development of educational video sharing sites to learn software through tutorials in a screencast form, was agreed by [7] as being very important to be developed for students' use, especially for those registered in information technology (IT) or multimedia study

courses. The reason behind this statement is that these students need to learn different software to accomplish the given assignments and projects by their lecturers. Hence, interactive learning using multimedia software with text, graphic, audio, video and animation elements could create a stimulating learning environment when the module or content used has embedded animation and graphics based on specific topics. In parallel with Gardner's Theory of Multiple Intelligence, the use of pictures, sound, animation and video in teaching can influence students' intelligence in a particular field [8].

Recently, video production and consumption rates have intensified. Several studies had been carried out in different levels of education, and these studies revealed the extended and promising use of videos [9]. [9] had proposed a framework, consisting of a methodology and a set of guidelines for educational video development. Besides that, video recordings and in-class lectures complement each other to achieve effective learning [10]. Due to this situation, the development of educational videos should be expanded in terms of quantity and quality. The achievement of effective learning will only have a tremendous impact if the instructional content successfully fulfils the learning objectives of designated topics. As asserted by [11], various technologies had been used for video development, storage and delivery, and the technologies had moved forward dramatically over the last few times.

An educational video can be a highly effective tool to increase student engagement, attendance, and satisfaction [9]. They also believed that video streaming and video-on-demand (VoD) constitute new added values to educational videos. Hence, through educational videos, learners seem to enjoy this flexible, student-centred approach [12]. Several studies by [13] and [14] discovered that the usage of videos to learn English can make learning more meaningful and serves as an effective tool to enhance students' attention and motivation, as well as language skills. It can facilitate the students in creating more interest in learning and improving their communicative competencies as they can acquire rich learning experiences.

Further to that, [15] indicated that video learning can assist students with learning disabilities in following mathematics material well. In addition, [16] agreed with [17] that video learning effectively improves students' learning outcomes and conceptual understanding. Thus, all the findings by [15], [16], [17], [13] and [14] demonstrate video learning through educational videos are an effective learning medium that can improve students' understanding. In this study, educational videos refer to videos with educational content that can spark students' interest so that they will have better understanding and remembrance of the video content. It is believed that this kind of video could increase student engagement which leads to achievement in the courses that students take.

Creating local content in educational videos requires academic content which should be openly and freely available. This situation influenced students to increasingly look to their local institutions for support with their learning, rather than for the delivery of content [18]. Thus, the research problem to be solved is how students or learners acquire that knowledge and learn how it can be used. One of the solutions to this problem is through the development of educational videos as learning material for the Digital Illustration course, which is expected to assist students in idea creation and enhance their understanding of the chosen topics in the course. Other than that, tool such as augmented reality would also benefit students as well as contribute to teachers in order to diversify teaching aids in the classroom [19].

### **3. METHODOLOGY**

The ADDIE (*Analysis, Design, Development, Implementation, and Evaluation*) instructional model was applied in planning the preparation and execution of the educational videos. This

model is one of the popular instructional design models used by many researchers to develop software or applications related to the education field, instructional courses, and training programs. This approach provides educators with five (5) useful and clearly defined steps for the effective implementation of instruction. This five-step approach was chosen as the videos developed would be used for T&L purposes; therefore, the designer was supposed to systematically think and plan the whole process from beginning to its completion. The steps for each phase are detailed as below.

### 3.1. Analysis

This study conducted a requirement need analysis upon selected topics, namely the needs of targeted users/learners, software and hardware to be utilized, and the cost and time allocation needed to develop each video. In this phase, storyboards for the videos, thumbnail development and video recording were also set into the plan. Usability testing of video content among the targeted learners was proposed to be done at the end of the video prototype development.

In this phase, open-source software was used as it offered a simple menu and permission was not required to get the license. Meanwhile, for hardware, a personal computer equipped with minimum multimedia specifications with good performance and speed (such as graphic card, video/graphic adapter (VGA) card and audio speaker), with at least 16 Gigabyte (Gb) random access memory (RAM) and a desk jet printer were sufficient in assisting with drawing the storyboard and printing the draft. Simple storyboards were roughly outlined to visualize the storyline for each topic where its preparation was agreed upon between researchers and video content developers. The cost and time allocation for the whole project was also discussed among the parties involved so that this study was given sufficient attention to be accomplished before usability testing. As for the manpower involved, an undergraduate student was appointed to develop the educational videos as planned. This person was also accountable to hire actors (or actresses) to be involved in the video recordings (if needed).

### 3.2. Design

The early phase of this study began with the pre-production phase of the educational video. To start designing, all the document specifications from the Analysis phase were visualized on canvas or paper. Designing caters to four (4) elements, which are design a *storyline* for three (3) different videos, design a *storyboard*, design the *character* in each video, and design a suitable *environment* for each video. Since there were three (3) different videos, the first topic was designed slightly different from the other two (2) videos. The latter videos were related to each other to increase the learners' understanding of graphic elements and principles at the same time. Figure 1 dictates one of early storyboard for montage interface.

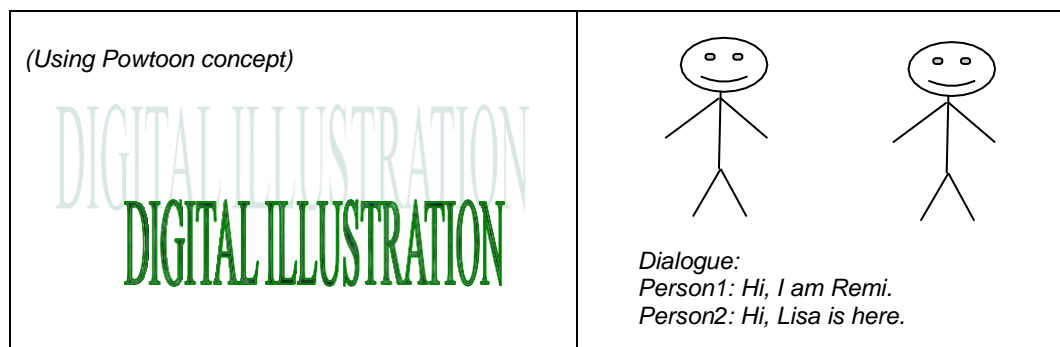


Figure 1. Storyboard for montage

A series of discussions had been set among the video content developers and researchers during the early phases. The video content developers had agreed to spend at least one (1) month to prepare the draft for three (3) videos and then revert to the researchers for comments and further modification. After the final draft of the storyline design and storyboard preparation, the content developer moved to the next phase, which was the production phase.

### 3.3. Develop

During the production phase, the content developer worked meticulously to transfer the drawing form of the storyboard to digital form. The person had taken about one (1) and a half month to prepare three (3) educational videos for this study. The development phase was followed by the editing process. After each prototype of the videos had reached 85% of development, the researchers gathered to watch the prototype and suggested further recommendations. The process of editing after the final upgrade had taken approximately another one (1) month. Figure 2 shows main interface for the first video – Introduction to Graphic.



Figure 2. Main interface for the first video

### 3.4. Implement

In this phase, all the developed videos had been completed. Next, the videos were uploaded to the Google Drive platform for delivery to the targeted users in this study. Google Drive was selected as it was easy to maintain as users only need to have access to the link of the videos to be watched. Google Drive also offers a large capacity of storage, so it could cater for videos which utilize almost 80 Megabytes (Mb). As a final product for user testing, Figure 3 showed some of video interfaces that had been developed and seen by the students as proposed users.

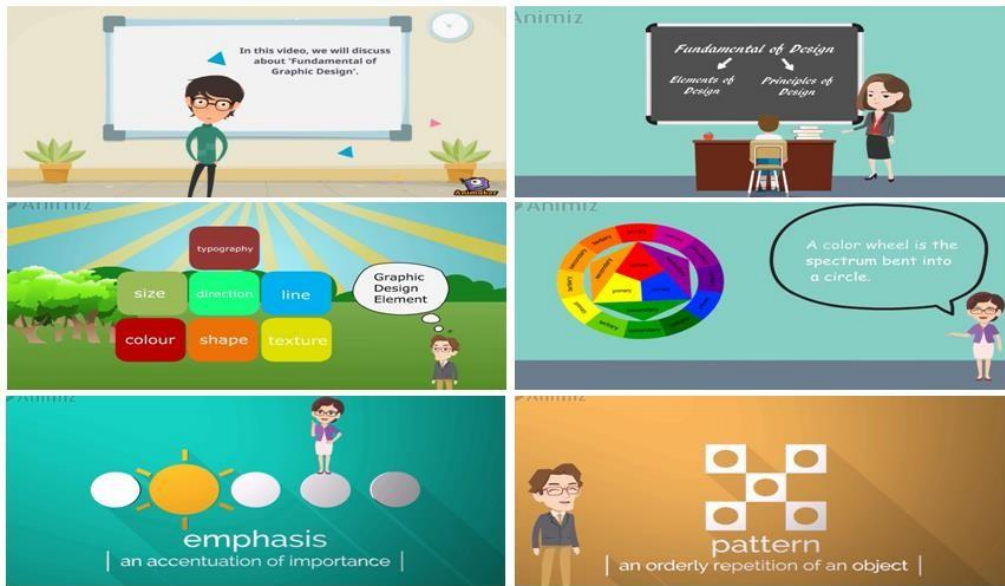


Figure 3. Some of video interfaces

Next, the link for each video was shared with the selected respondents. The respondents of this study were undergraduate students from the Multimedia Education Degree who registered for the Digital Illustration program in the first semester during precious academic year. The selected respondents were asked to watch three (3) educational videos by first downloading them from the Google Drive link given. The advantage of this implementation was that the respondents could watch the videos at their convenience. They were given about one (1) week for each video to understand the concept in it so that they could apply it throughout their individual assignment or group project. Subsequently, they were required to answer a simple questionnaire that was distributed online through Google Form. The questionnaire was to obtain feedback on users' preferences and recommendations for video enhancement.

### 3.5. Evaluate

Finally, evaluation took place to complete the ADDIE instructional model. The evaluation was done using usability testing so that direct comments or alterations could be documented. During this phase, data gathered from the questionnaire was analysed to be presented and discussed for further reflection and recommendation. All the comments received from the users (in this case, the undergraduate students) would be remarked and considered so that continuous modification could be done towards the videos. This post-production phase was repeated until the researcher was satisfied with the final outcome of the videos according to the users' requirements.

## 4. TESTING AND ANALYSIS

The design of this study applied a descriptive analysis using the quantitative method approach, which is a research method that used statistics or numerical form with measurable variables [20]. The research instrument or tool used in this study was a questionnaire form through Google Form that enabled researchers to gather data accurately among many respondents. The questionnaire used for this study comprised items in the form of the 5-point Likert scale. This scale was used to avoid a response bias in the statement given [21]. The questionnaire was divided into three (3) sections, namely respondents' demographic, design aspect, and usability aspect. A descriptive analysis was performed to analyse each item. There was a total of 31 respondents, with 11 male

students (35%) and 20 females (65%), who had answered the given questionnaire. The detailed findings are reported as below.

#### 4.1. Analysis of video interface design aspect

In this section, all the questions were mainly about the functionality of multimedia used in the educational videos. The preliminary analysis showed a satisfactory level for all items. Two (2) of the items, specifically Item 1 and Item 8, showed the highest mean value (4.42), indicating respondents strongly agreed with the items. Item 1 referred to the use of graphic element was easy to understand, while Item 8 indicated the video content was concise and clear. The respondents also agreed with the statements ‘text used is easy to be read’, ‘video content has continuity’ and ‘information presentation flow in the video is understandable’.

However, there were respondents who disagreed with two (2) items, which were Item 3 and Item 9. For Item 3, a number of respondents claimed that the audio used in the video was unclear. Meanwhile, for Item 9, there were a few who disagreed with the ‘layout of the design is consistent’. Overall, the video interface design aspect had achieved a mean score value of 4.28 and this showed that respondents agreed with the design aspect for the videos. All the mean scores are shown in Table 1.

Table 1. Video interface design analysis.

Item	Statement	Mean Score
1.	Graphic used in video is easy to understand.	4.42
2.	Graphic used in video is clear.	4.29
3.	Audio used in video is clear.	4.23
4.	Audio used in video is easy to understand.	4.13
5.	Text used is readable.	4.35
6.	Text used is easy to understand.	4.29
7.	Animation used flows smoothly.	4.23
8.	Video content is clear.	4.42
9.	Design layout is consistent.	4.16
10.	Video interface design is attractive.	4.19
11.	Information presentation flow in the video is understandable.	4.35
12.	Video content has continuity.	4.35

#### 4.2. Analysis of Video Usability Aspect

For video usability analysis, all the mean scores had achieved more than 4.0. It was discovered from the findings that the mean score average value for the usability aspect was 4.28, which indicated respondents agreed with the video usability aspect. Item 4 had scored the highest mean value among all seven (7) items with a mean of 4.45. This score showed that the respondents strongly agreed that the information conveyed through the video is well-understood. The condition was influenced by a few factors, such as straight-forwardness and language used, as shown in the mean score achieved.

Besides that, the respondents understood the language used in the video, as well as considered the video presentation to be comprehensible. Hence, they were able to use the video in an easy and pleasant way. This situation showed that they were satisfied and willing to use the videos as self-learning material. Table II shows the mean score analysis for every item in the video usability aspect.

Table 2. Video usability analysis.

Item	Statement	Mean Score
1.	I can use this video nicely.	4.19
2.	I can use this video easily.	4.26
3.	I am satisfied using this video.	4.16
4.	I understand the information from the video.	4.45
5.	I understand the language from the video.	4.32
6.	Video presentation is not confusing.	4.35
7.	I will use the video as learning material.	4.19

## 5. CONCLUSION

The final product for this study was three (3) educational videos which were successfully developed according to the proposed specifications with chances for advancement. The results of this study were video design and usability aspects that were adequate and satisfactory. However, there are several suggestions to be considered based on the respondents' comments, such as the audio quality can be improved and at the same time ensure that the intonation is not so fast in the videos. It is also recommended to use a human voice-over compared to audio from the computer, to make it more natural and easier to understand. Specification of design consistency for every video interface and less use of text (instead replace it with simple graphics) are also among the recommendations.

Besides that, thorough elaboration and the use of timely animation are also suggested to be incorporated in the videos. To conclude, the educational videos could be wisely used as a reference by students who registered for the Digital Illustration course in order to enhance their understanding of selected topics in the video. This also as a prove that use of technology can encourage student engagement in online learning activities, which could lead to the active implementation of blended learning. An educational video can play part of the role in creating a blended learning approach among students in higher learning institutions. VBL empowers learners, teachers and instructors in making learning happen 24/7, hence learners are able to access knowledge whenever and wherever they like. VBL likely offers experience of more interactive, immersive and truly engaging in future, as asserted by [22] showed. This research is also parallel with [23] who emphasized multimedia, as widely used in the T&L process, has conquered the heart and soul of the learners, and learners' interest have increased and deepened, making them more attentive and participative.



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