

# A Field Survey on the Types of Videos and Learning Approaches deemed appropriate for the 21st Century Teaching and Learning

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**Abstract-** Undisputedly, rapidly changing technologies have introduced many unprecedented challenges to almost every sphere of the people's lives. For one, the educational realm has witnessed many changes made to the teaching and learning process to ensure students can learn with greater efficacy. Against this backdrop, this paper discusses the findings of a field study based on an online survey involving 91 students of Sultan Idris Education University, Tanjung Malim, Perak, Malaysia. The researchers used Google Form, which is a free survey development tool, for the development of online questionnaire of the survey. The main aims of this field study are as follows: (a) to determine the type of learning video deemed relevant to the 21st century learning, (b) to determine the teaching approach of lecturers as preferred by students, and (c) to determine the relevant teaching approach for subjects that entail logical thinking. Data collected were analysed descriptively, yielding a number of interesting findings. Firstly, 90% of the respondents (n = 82), which constituted an overwhelming majority, stated that they would prefer voice-recorded video and whiteboard animation as the appropriate learning aids. Secondly, at 60% (n = 55), more than half of the respondents indicated that lecturers should use a whiteboard and a portable visualizer to help improve their teaching process. Finally, a significant number of the respondents, at 81% (n = 74), indicated that the teaching of subjects requiring logical thinking (e.g., programming subject) would be best carried out with the use a whiteboard and a portable visualizer. Collectively, these findings suggest that novel interactive learning tools are indispensable in the teaching and learning process, especially for subjects that require higher order thinking skills, in this new millennium.

**Index Terms-** interactive slides, whiteboard animation, portable visualizer, video recording, 21st century teaching and learning

## I. INTRODUCTION

As the world is moving forward, the educational realm is expected to embrace a new paradigm shift. Educators and education need to be responsive to new technological changes that are continually changing unabatedly [1] More importantly, new teaching and learning styles may need to be developed to help prepare learners with new skills deemed relevant with this 21st century, where they have to be creative, and innovative [2].

In fact, new, novel technologies have spurred many developments in educational realm through the use of an array of media that helps facilitate the dissemination of knowledge creatively. Arguably, the proper and optimal utilization of technologies will be able to improve the quality of teaching and learning that is appropriate in this new century. To realize such effective use is challenging, entailing future educators to carefully and meticulously plan their teaching approaches or strategies in which relevant technologies can be applied to facilitate and heighten student learning. Clearly, the existence of the mobile technology provides a window of opportunity for educators help improve their teaching and learning process such that it becomes more appealing and engaging.

In this regard, the main challenge is to create an optimal computer-based learning environment [3]. Since their inceptions, computer applications, in particular multimedia learning applications, have been used by educators to present their teaching contents and carry out teaching exercises and to help engage students in learning [4]. For instance, videos have become one of the important computer-based communication tools that is widely used by students of various learning levels, ranging from secondary to tertiary education [3]. Such popular use of these applications is hardly surprisingly assert that students see such technological applications to be indispensable, which can help them improve their learning ability and enhance their learning performance [5].

Scholars have classified products of digital learning materials into two main categories, namely static teaching materials and dynamic teaching materials. The former include the use of word processing applications, such as Microsoft Word and notes converted into pdf files, PowerPoint slides, and others. On the other hand, the latter uses applications that typically contain rich multimedia elements, such as text, animation, audio, video, and graphics. For video, it can be classified into two types, namely teaching video that uses presentation slides and teaching video that uses whiteboard animation.

As such, finding the effective approach to help convey information effectively to learners should never be taken lightly. Such an approach deserves strong emphasis in light of the advancements in Information and Communication Technology (ICT) by which dissemination of information can be efficiently carried out in the teaching and learning process. Certainly, the use of ICT brings a numerous benefits to both teachers and

students. For example, the use of graphics can help students retain facts or concepts that they have learned the classroom — in short, it helps improve students' long term memory according to [6]. In addition, ICT applications can help explain complex or abstract concepts to students, which would be otherwise difficult to do without their utilization. Moreover, ICT applications can help teachers and trainers to monitor students' understanding during the learning process [7]. Interestingly, ICT applications or systems can help create interactive classes that heighten students' interest and motivation, thus helping students to remain focused and eager to attend classes [8]. Given these potential educational benefits, the researchers embarked on this study to identify the effective and efficient teaching and ICT-based learning approach through a field survey. For the survey, a set of survey questionnaire was developed to elicit respondents' opinions and feedback of the best approach for teaching and learning deemed relevant to the 21st century.

### III. THE RESEARCH OBJECTIVES

The aim of this study was to examine the difference in students' perception with regard to two methods of teaching, namely teaching based on recorded video and interactive slides and teaching based on recorded video and whiteboard animation. In addition, this study sought to determine the teaching and learning approach preferred by students and to examine their preference for teachers to select and use appropriate teaching and learning technique in teaching courses that entail logical thinking. As such, the researchers formulated three research objectives to guide this research as follows:

- 1) To determine the type of video preferred by students for the 21st century teaching and learning.
- 2) To determine the teaching and learning approach that students deem appropriate for their lecturers to use.
- 3) To determine the teaching and learning approach that students deem appropriate for their lecturers to use in teaching courses that entail logical thinking.

### IV. RESEARCH METHODOLOGY

The research methodology of this study encompassed the study sample, research instrument, and procedures in conducting this undertaking. The proper choice of a research methodology is critical to ensuring a study can be carried out successfully by strict adherence to a set of procedures that helps the researcher collect and analyze data systematically. Specifically, this research employed the quantitative approach, requires numerical data on which statistical analyses will be performed to yield results that can help the researcher to reach an understanding of a phenomenon being investigated [12].

#### A. Research Design

The research design provides an overview of a research framework, planning, and strategy in determining appropriate research procedure [13]. For this study, a research design based on quantitative and qualitative approaches was used to help the

### II. PREVIOUS STUDIES

In 1991, the use of interactive whiteboards had radically changed the way in which teaching and learning process was carried out. Essentially, the interactive whiteboard is touch screen that works in unison with a computer and a projector. As such, its capabilities far surpass those of conventional whiteboard, overhead projector and flipchart. The use of interactive whiteboard can be further enhanced by integrating it with various digital sources that helps create compelling presentations for educational purposes [9]. Moreover, this novel whiteboard is capable of transforming the computer into a potent tool for teaching and learning through the amalgam of vivid colors, texts of various designs, integrated websites, presentation software, and scanned images, among others [10]. Today, the use of whiteboard is further emboldened with whiteboard animation, which helps make learning more interactive, motivational, and fun too. Such attainments have been demonstrated in a study by Israeli students became more motivated and engaged in learning assisted with whiteboard animation [11].

researcher provide appropriate answers the research questions and address the research objectives. The first phase in carrying out this research was the planning stage in which the task of the researcher was to select the respondents and location of the field survey. Selecting appropriate respondents in terms of their demographics is important to ensure the success of such a field study, irrespective of its scale, as being either small or large. As such, this field study involved the participation of undergraduates from Sultan Idris Education University, Tanjung Malim, Perak, who were majoring in ICT and Multimedia.

The second phase was the implementation phase in which an online survey questionnaire was developed by the researcher using Google Form, which is a free online survey development tool. Also in this phase, the researcher developed two types of videos that, albeit having the same contents, were created using different video recording techniques. The first video was developed based on interactive PowerPoint slides embedded with recorded voice; whereas, the second video was developed using VideoScribe that was also embedded with similar recorded voice. Both videos were then uploaded to YouTube channel so as to allow the respondents to view them before responding to the survey questions. The survey form was made available to the respondents by providing them with the Uniform Resource Locator (URL) of the online questionnaire. Figure 1 and Figure 2 show the screenshots of the interfaces of the first and second video, respectively

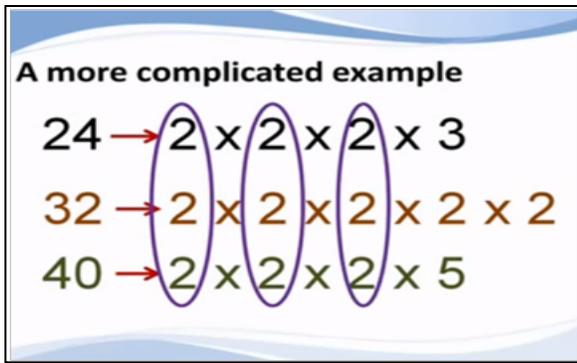


Figure 1: A screenshot of the interface of the voice-recorded video with interactive slides

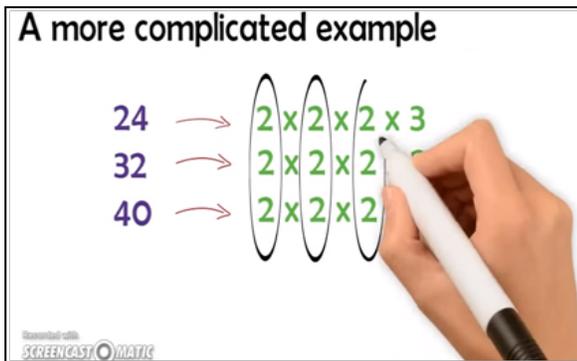


Figure 1: A screenshot of the interface of the voice-recorded video with interactive slides

The final phase of the study involved the analysis and discussion of results. In this phase, the researchers analyzed all data elicited from the respondents' responses to all items of the online questionnaire. Later, the researchers discussed and summarized the findings of the analysis before preparing a complete report of the field survey carried out

The research design is discussed in detail using the framework of activities of the study. Specifically, this framework was developed to help highlight the research process through which the researchers had undergone in completing the field study. As previously discussed, the field study carried out consisted of three phases, namely the planning phase, the implementation phases, and the analysis and discussion phase, as depicted in Figure 3.

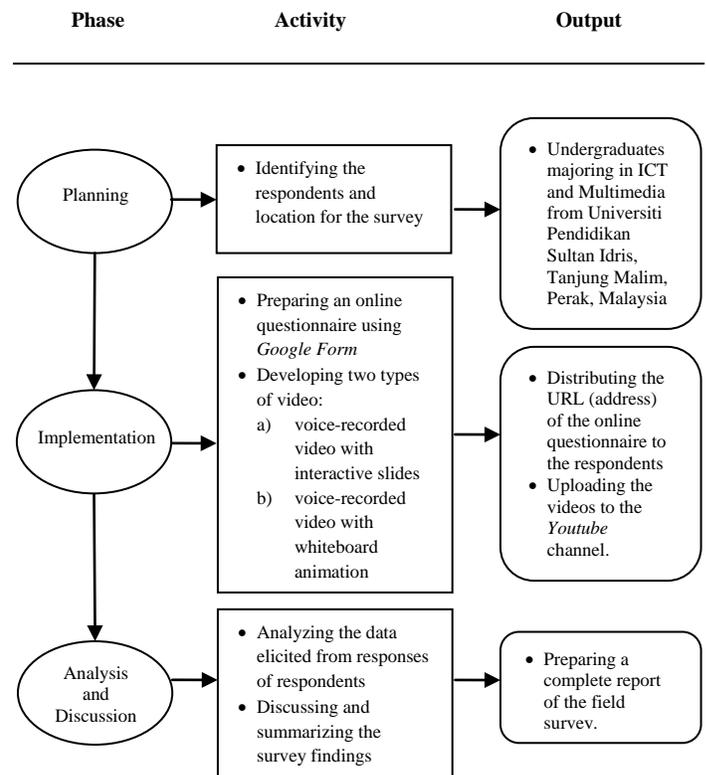


Figure 3: The framework of activities

### B. The Respondents

The respondents consisted of 91 undergraduates majoring in Information and Communication Technology and Multimedia from Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak, Malaysia, who were randomly recruited from several intact classes.

### C. The Research Instrument

The research instrument used in this field survey was a set of online questionnaire to help the researchers determine the type of learning video that students prefer for the teaching and learning process. In addition, the same instrument also helped determine the teaching method of lecturers that is preferred by the same students. Essentially, this research instrument comprises three main parts. Part A contains items relating to students' demographics, namely gender, date of birth, and major of study. Part B contains items relating to internet use, duration of use, and blended learning. Part C comprises items relating to the type of preferred learning video, the reason for such preference, and preferred learning style and teaching method of lecturers for courses or subjects requiring logical thinking. In this part of the questionnaire, the URLs of the online videos were also provided to allow the respondents to watch two types of learning video before answering the questions

## V. ANALYSIS AND DISCUSSION

### A. *The analysis of the type of video preferred by respondents for 21st century teaching and learning.*

The findings showed that an overwhelming majority (90.1%) of the respondents selected Video 2 (voice-recorded video with whiteboard animation) as the preferred type of learning video. In contrast, only a small minority (9.9%) of the respondents indicated that they preferred Video 1 (voice-recorded video with interactive presentation slides). This finding suggests, in the context of 21st century learning, a particular technology that can provide greater ease in the learning process will be much preferred. In fact, such preference is hardly surprising content that students watching hand movements on screen will be able to retain and transfer information more effectively [14].

From the perspective of “cue-summation” learning, learners will be able to learn more effectively and efficiently with more stimuli [15] and will be able to retain verbal information much longer in their minds when such information is complemented with visual information [16]. Moreover, the application of whiteboard animation in the teaching and learning process will help realize the concept of learning that transcends geographical and temporal barriers [17]. In fact, the leaning approach used by lecturers in which video recording is employed for teaching is known as blended learning. Such learning is the result of combining face-to-face learning in the classroom with online learning using a variety of mobile devices, such as smartphone, iPad, or tablet [18]. As such, recorded video clips used in blended learning will be able to help students gain a better understanding of the learning contents [19].

### B. *The analysis of the teaching and learning method of lecturers preferred by respondents*

There were eight items that probed respondents’ opinions on the preferred teaching and learning method of their lecturers. The findings showed that more than half (60.4%,  $n = 55$ ) of the respondents rated the highest the item relating to the teaching method that uses a whiteboard and a visualizer. The next highest item rated by respondents was related to the teaching method that uses a whiteboard and presentation slides, where 37.4% ( $n=34$ ) of them indicated such a preference. Predictably, only a handful of respondents (2.2%,  $n = 2$ ) indicated the preferred lectures without any learning aids. These findings are consistent with the assertion that students will be more attracted to teaching methods of lecturers that utilize ICT tools during teaching [20]. Presently, the use of latest ICT hardware and software, such as computer applications, portable visualizer, and portable projector, is becoming pervasive to help both learners and instructors. Collectively, such ICT tools can serve as a new mechanism to help support and enhance interactions between students and teachers during the teaching process [6]. Figure 4 shows the teaching method of lecturers preferred by respondents.

Teaching methods of lecturers as preferred by the students

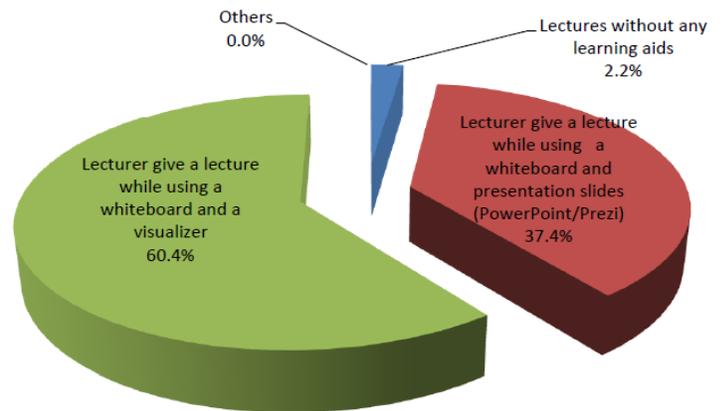


Figure 4: The type of teaching methods of lecturers as preferred by the students

### C. *The analysis of the teaching and learning method of lecturers preferred by respondents for subjects requiring logical thinking*

The findings showed that a substantial majority (81.3%,  $n = 74$ ) of the respondents indicated that they preferred the teaching method that uses a whiteboard and a visualizer in the learning of subjects requiring logical thinking. Trailing behind was the teaching method that uses a whiteboard and presentation slides, where 13.2% ( $n=12$ ) of the respondents indicated such a preference. Again, the method that relies solely on lectures without any learning aids received the lowest rating, where only 2.2% ( $n = 2$ ) of the respondents preferred this method in the learning of subjects entailing logical thinking. These findings are to be expected as teaching using visualizer has several benefits. For example, lecturers can easily change and select appropriate display of learning contents to suit specific students’ learning needs [6][21]. Effectively, such flexibility enables lecturers to discuss learning contents more clearly, especially for courses or subjects that contain many logical concepts, which ultimately leads to better student learning [20]. Likewise, the use of ICT learning applications can assist lecturers explain complex concepts more efficiently to [7] and also help students retain information more lastingly [6].

Table 1: The type of teaching methods of lecturers as preferred by the students in the teaching of subjects requiring logical thinking

Teaching and learning methods of subjects requiring logical thinking	Results (%)
Lecturer give a lecture while using a whiteboard and a visualizer	81.3%
Lecturer give a lecture while using a whiteboard and presentation slides (PowerPoint/Prezi)	13.2%
Lectures without any learning aids	2.2%
Others	3.3%

## VI. CONCLUSION

The educational realm has undergone many evolutionary changes resulting from the constantly changing technologies, especially ICT. Arguably, in the 21st century, these changes have transformed the learning environment such that ICT has become an integral part of the teaching and learning process. As demonstrated in this study, students have a strong proclivity for ICT learning applications, such as voice-recorded video and whiteboard animation, to help them learn more efficaciously and interactively. As such, the onus is on lecturers to use novel learning applications in their teaching as students will expect them to do so. In addition, such novel learning application can be used in blended learning such that students can learn anywhere, anytime. Particularly, the use of whiteboard animation can help spur the growth of mobile learning to fulfill new learning demands of this millennium as virtually all students own mobile devices.

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