Exploring the Impact of Video Multimedia on Learning Achievement

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Abstract. This paper presents a literature review of the impact of multimedia videos on learning achievement as a part of research on students' perceptions of online learning using learning multimedia videos situated in an e-learning environment at one of universities in Jambi, Indonesia. From previous studies, it can be shown that the use of video multimedia in learning provides positive impact for students in increasing learning motivation, cognitive achievement, swelling their participation in active learning, and growing higher learning enthusiasm. In other words, the use of multimedia video is very supportive for students in achieving more meaningful learning processes and outcomes. Therefore, in this study, it is explored empirical findings of the previous studies focusing on how is the impact of video multimedia in learning achievement.

Keywords: multimedia learning · students' perception · video-based learning

1 Introduction

The rapid development of information technology presents both challenges and opportunities for teachers, learners, and education managers at all levels of education. Particularly for teachers, the development of information technology, which is in line with the development of multimedia technology, forces them to adapt to appropriate teaching methods. During the global pandemic COVID-19, the challenge of utilizing integrated information and communication technology (ICT) with multimedia is a must. Indeed, the challenges provide an opportunity for teachers to be creative in creating and developing their own learning materials, media, methods, and strategies to be used in learning environment.

Teachers over the world respond to these challenges in different ways. Many teachers are frustrated with this condition because they are forced to teach online while the skills in using this technology are minimal. On the other hand, there are many teachers who respond positively to it by actively and creatively increasing their competence in mastering learning technology, balanced with knowledge and skills in pedagogy and mastery of learning materials. Teachers who have this positive attitude can wisely change their teaching methods by utilizing learning resources and learning tools that can practically be used to achieve learning objectives. For teachers who have a positive attitude and creativities, multimedia technology can be used to develop learning materials and media.

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By using gadget and software they have teachers can record learning videos that can be used to teach according to their subject matter. For instance, by using the simple and very popular software like PowerPoint, the video recording can be modified and equipped with text and narration to become interesting media and learning materials.

In this context, the use of video for learning that contains learning messages combined with appropriate pictures and narratives will make learning more interesting and concretize abstract theories. In other words, the use of learning multimedia that can be presented in the form of videos is indispensable for learning during the Covid-19 pandemic.

2 Dual Coding in Learning Theory

Dual coding theory is a theory that is at the root of the study of the effectiveness of multimedia in the context of education and learning. This theory was put forward by Paivio [1], which in principle emphasizes that to increase effectiveness in learning, humans need verbal associations and visual images simultaneously. In this context it can be said that the right combination of words and pictures effectively facilitates human learning.

The essence of this theory is the knowledge obtained by humans from the learning process using the eyes and ears to process verbal and non-verbal information. From the perspective of cognitivism, this information processing involves stimuli, senses, short-term and long-term memory. In principle, to reach an understanding of something, it is necessary not only to have visible information, but also to be more effective if it is equipped with audible information. The implication is that in the context of learning theory, the development of learning tools needs to consider the delivery of learning messages that can be seen and heard, utilizing dual channels in obtaining information.

3 Impact on Learning Achievement

Studies on the usage of video multimedia in learning have been carried out by many educational researchers. Research conducted by Herrlinger et al. [2] seeks to find answers to the research question, whether multimedia learning materials consisting of a combination of text and images can facilitate learning. From the results of this study, it can be shown that there is a stronger effect of the combination of text and images on children compared to older children.

In a different learning context, experimental research conducted by Aloraini [3] shows results indicating that the use of multimedia has a positive impact on better academic achievement in the context of universities in Saudi Arabia. In this study, quantitatively researched the impact of using multimedia on academic achievement of undergraduate students. Specifically, this experiment involved 20 female students in the experimental class who studied computers using multimedia presentations and 20 female students who studied traditionally using the question-and-answer method and discussion.

In line with Aloarini's research above, in the context of science learning, Ercan [4] shows that the use of multimedia teaching materials has a significant positive impact on

academic achievement and better attitudes of learners towards learning materials. In line with this, Ginns [5] specifically found that the use of learning materials in the form of a combination of pictures and narrated text facilitated good learning compared to learning only using a combination of pictures and written text.

Furthermore, in the context of using multimedia for learning English as a foreign language, especially in the aspect of reading comprehension, Niknejad and Rahbar [6] found that the use of dynamic visual multimedia has a stronger positive impact than static visualization. This finding indicates that the use of multimedia has a significant positive effect on strengthening text comprehension.

Furthermore, specifically Adel, Davoudi, and Pourfarhad [7] evaluated the effectiveness of multimedia in the context of learning using CALL (computer assisted language learning), namely language learning supported by the use of computers. In their experiment, Adel et al. compared the understanding of English text material as a foreign language by 60 participating students at Iran University using two different treatments. In the experimental class, multimedia was used, in the control class, participants read traditionally using reading texts presented in printed form.

From this experiment, it was revealed that the average understanding and learning motivation in the experimental class was significantly better than the control class. These findings indicate that the use of multimedia has a positive effect on increasing participants' understanding and motivation in the teaching and learning process. In line with this, Alkhasawneh, Rahman, Ayub, and Daud [8] focused on the study and development of multimedia texts as learning media to improve understanding from the perspective of cognitive theory in multimedia learning by referring to Mayer [9].

In the context of this research, Alkhasawneh et al. [8] found that learners who utilized dual-channel multimedia (verbal and pictorial) experienced a significant increase in understanding in reading English texts. This finding is supported by Cho [10] who shows that multimedia-assisted learning is very helpful in strengthening vocabulary acquisition in English. Likewise, in recalling vocabulary that is rarely used, the use of multimedia has a significant positive impact.

Furthermore, from the perspective of a qualitative study, Joshi [11] shows that the use of multimedia strengthen learners' motivation, increase their participation in learning activities, provide richer and more interesting information and presentations so as to increase higher learning enthusiasm. Therefore, the use of multimedia is very supportive in achieving more meaningful learning processes and outcomes.

Thus, the research findings described above show a strong tendency that learners' understanding of texts can be improved through the use of multimedia. Therefore, in this study, it will be explored more specifically which multimedia format is effective to use in learning for undergraduate students.

4 Conclusion

To sum up, a review of previous studies shows that the use of multimedia videos provides huge benefits for improving the learning process and outcomes. In addition, the use of videos increases learning motivation, improves students' abilities in cognitive, affective, and psychomotor aspects. Specifically in the context of language learning, the use of

multimedia videos has a strong impact on increasing text comprehension, vocabulary acquisition, and enthusiasm in learning.

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