



IMPROVING EFL LEARNING OUTCOMES BY INTERACTIVE MULTIMEDIA USE AND LEARNING STYLE

by

Adrianus Nabung*

Universitas Katolik Indonesia Santu Paulus Ruteng, Indonesia

email: adrianusnabung@gmail.com

***Corresponding author**

(Article history: Received: 2022-10-05 Revised1: 2023-01-04 Revised2: 2023-02-07 Accepted: 2023-02-14
Published: 2023-02-27).

Abstract:

The dynamic linkage of interactive multimedia approaches and learning styles can affect EFL students' learning outcomes. In this research, the combination of text, video, audio, and kinesthetic will be effective. This research analyzed the effect of interactive multimedia and learning styles on students' English learning outcomes. This research approach is a quantitative approach with a quasi-experimental type of research. The subjects of this study were the students of vocational schools in Manggarai, NTT-East Indonesia. Sampling used a purposive cluster by considering the characteristics of the school and obtained two sample schools, namely SMK Swakarsa as the control group and SMK Karya as the experimental group. After the application of learning media, there was a change in the results, namely an increase in student learning outcomes in the control and experimental groups. The average value of the control group is 76.46, and the average value of the experimental group is 74.38. Thus, there is a dynamic linkage between the use of interactive multimedia and understanding students' learning styles to EFL learning outcomes. Both learning style and learning media can determine student learning outcomes.

Keywords: EFL, learning outcomes, multimedia, interactive, learning styles

Abstrak:

Keterkaitan dinamis dari pendekatan multimedia interaktif dan gaya belajar dapat mempengaruhi hasil belajar siswa EFL. Dalam penelitian ini, kombinasi teks, video, audio, dan kinestetik akan efektif. Penelitian ini menganalisis pengaruh multimedia interaktif dan gaya belajar terhadap hasil belajar bahasa Inggris siswa. Pendekatan penelitian ini merupakan pendekatan kuantitatif dengan jenis penelitian quasi eksperimental. Subjek penelitian ini adalah siswa SMK di Manggarai, NTT-Indonesia Timur. Pengambilan sampel menggunakan gugus purposive dengan mempertimbangkan karakteristik sekolah dan diperoleh dua sekolah sampel, yaitu SMK Swakarsa sebagai kelompok kontrol dan SMK Karya sebagai kelompok eksperimen. Setelah penerapan media pembelajaran, terjadi perubahan hasil, yaitu peningkatan hasil belajar siswa pada kelompok kontrol dan eksperimen. Nilai rata-rata kelompok kontrol adalah 76,46, dan nilai rata-rata kelompok eksperimen adalah 74,38. Dengan demikian, ada keterkaitan yang dinamis antara penggunaan multimedia interaktif dan pemahaman gaya belajar siswa terhadap hasil belajar EFL. Baik gaya belajar maupun media pembelajaran dapat menentukan hasil belajar siswa.

Kata kunci: EFL, hasil belajar, multimedia, interaktif, gaya belajar

How to cite this article

Nabung, A. (2023). Improving EFL learning outcomes by interactive multimedia use and learning style.

Premise: Journal of English Education and Applied Linguistics, 12(1), 256–274.

<https://doi.org/10.24127/pj.v12i1.6223>

INTRODUCTION

The use of multimedia devices in learning is an integral part of various efforts by teachers to adapt the learning process according to the student's learning style. Learning media is a component of the approach in the teaching delivery system to support the learning process. In its development, learning multimedia devices should be based on a clear and measurable goal, namely practical, interactive, and fun teaching and learning activities supported by engaging learning media and facilitating student understanding (Franzoni & Assar, 2009). Meanwhile, Understanding learning styles is a consistent way for students to understand, remember, think, and solve problems with stimuli and information. Learning style is a person's favorite way of processing experience and information. Learning style is how students consistently build knowledge, promoting creativity between the four learning models that significantly impact knowledge, skills, or attitudes through learning or experience. Learning styles are also known as learning modalities. Another term for modality is sensory acuity. It means a human-owned system to access the world and stay connected with the outside world. In Indonesian, the word sensory means senses or sensation. Humans have five senses to map information accessed from the small world: body, soul, and spirit, which are connected to the outside world. The five senses are sight, hearing, kinesthetic, smell, and taste. This study focuses only on three aspects of learning styles: visual, auditory, and kinesthetic (Ishartono et al., 2021).

Learning is an individual activity in achieving behavior change through training and experience involving cognitive, affective, and psychomotor aspects to achieve learning goals (Lotulung et al., 2018). According to some perspectives, learning is a transitional behavior that is not fixed and results from experience or planned learning. Conceptually, learning is a transitional activity of one's behavior so that there is an addition of knowledge, skills, and attitudes as a sequence of activities toward the development of a complete human being (Jarvis, 2012). It can be concluded that learning is a process of changing behavior after a series of activities to change the quality of human life to be fit for purpose. Education has become critical for humans to create superior quality future generations to face the current globalization competition. The concept of previous research confirms that education is a significant factor in human life. Through education, humans will grow and develop as complete individuals. The progress and decline of a nation's development process in all fields are determined mainly by the nation's education level. Therefore, the government must take

many ways to improve the quality of education to create a superior, quality generation and adapt education to the conditions of the times (Kruk et al., 2018).

Based on the results of learning English for high school/vocational high school students in the 2013 curriculum applied in Indonesia are still low. Study data on Indonesian high school students' record learning achievement index is still worrying (Bisnis, 2018). Some conventional issues at the secondary school level still relate to different learning tactics and methods used in educational activities. It is because there are few innovative ways to meet the demands of students for learning and because meaningful learning relationships are crucial. In this situation, the teacher's job has crucial importance. In the evolution of education and teaching, teachers' originality and invention are still comparatively low (Cholis Sa'dijah, 2021). Consequently, there is a need to support teachers' professional development following the primary tasks and scientific responsibilities they acquire at school. (Mensah Hervie, 2018). The same is true for vocational school teachers who are experts in English studies.

Teachers can often be ineffective communicators since they use words and even non-verbal symbols to convey knowledge. Therefore, using media to connect information must be less verbal (Dehghayedi & Bagheri, 2019). The correct learning materials can help pupils learn the content more rapidly. The list of some benefits of learning media are as follows (Saleh et al., 2020): 1) The delivery of the message is more uniform; 2) Learning can be made more engaging; 3) Learning time can be used more effectively; 4) Learning quality may be enhanced; 5) Students' attitudes toward learning will improve; and 6) Teachers' professionalism will rise. Based on this opinion, learning media is essential, significantly improving students' processes and learning outcomes (Aghni, 2018).

Interactive multimedia are frequently used in learning multimedia techniques to promote learning in the classroom. One benefit of interactive multimedia is related to the material's originality, which is varied and appropriate for students' learning styles. In light of this, learning tools aim to boost student motivation by selecting media platforms appropriate for their individual learning preferences. In addition, multimedia interactivity makes students focus on their particular computers, and the classroom climate becomes suitable to make learning time more efficient (Papastergiou, 2009). Students benefit from interactive multimedia's sound learning effects by using it in various ways throughout class activities (Darmayanti & Nova, 2022). These interactive multimedia is closely related to digital media and content trends. Diverse digital content in text, images, animation, sound, and video allows

students with various learning styles to understand learning material or messages well (Kartika Rini et al., 2019).

A person's learning style combines how they take in information and how that information or knowledge is arranged and processed. A description of learning styles is also a simple method for managing, storing, and applying information. Teachers can assist students in learning using their dominant learning style by being aware of their individual learning preferences. This introduction raises student achievement by adapting instruction to individual learners' preferred learning methods. According to this viewpoint, every student has a unique learning style. Different learning styles can be helpful for the classroom's learning, processing, and communication (Ma & Oxford, 2014). Make sure pupils learn in a way that combines several different learning styles. Congenital and environmental factors have an impact on everyone's learning style. Even individual students cannot personally change. However, certain things can be trained and made to fit within a setting that cannot be altered. Understanding learning styles does not automatically boost pupils' intelligence. However, different learning styles allow pupils to choose efficient learning strategies (Ramadian et al., 2020).

From this perspective, teachers must know well their students' learning styles. Introducing interactive learning media can have an equal impact on students' various learning preferences as learners (Dağ & Geçer, 2009). Regarding the relative importance of multimedia and single media, pupils are more interested in multimedia. Comparing the usage of single media with the use of multimedia is thought to improve vocabulary learning outcomes (Ayersman, 1996). Language programs benefit, but non-language classes do not (Tsang et al., 2020). Some of these studies demonstrate that multimedia is particularly appropriate for language acquisition to maximize all students' senses, leading to increased learning outcomes and learning interest.

According to early teacher role observations, many teachers need to be more proactive in identifying the variety of student learning styles, which results in improper accommodations for the learning process. The learning process could be more exciting and varied (Rahmawati & Suryadi, 2019). The traditional method of one-way lectures, especially when learning English, could be more efficient in helping students develop their proficiency in fundamental knowledge (listening, speaking, reading, and writing)(Nguyen & Pham, 2021). In addition, the use of learning media that is not optimal results in the diversity of student

learning styles not being accommodated to the maximum, so student learning outcomes are not optimal (Boekaerts & Niemivirta, 2000). Based on this explanation, the causes of the English learning outcomes that are not optimal are (1) the English language learning process has not utilized the learning media optimally, (2) the teacher has never carried out the diversity of student learning styles, and (3) the student's English learning outcomes not optimal.

Learning media is an essential component in improving the quality of education. The suitable media will be able to bring the learning situation to be fun (Hoinbala, 2022). A fun, creative, not dull, and innovative learning process will be the right choice for teachers to teach students (Fransisca et al., 2019). Besides, the learning media is also believed to build a conducive learning atmosphere (Nova, 2021). Researchers stated that using information technology as a learning medium will positively impact increasing student knowledge. Students are not charged with conventional learning models that force students to listen to lectures and take notes on the learning materials provided (Lim et al., 2016).

The quality of learning cannot increase the learning needs and outcomes of the students because learning activities are still carried out using the lecture method. It is also taking notes without providing adequate assistance to students, so there is not enough interaction related to the problems students face during the learning process (Q. Huang, 2022). Another previous study found that student-centered learning activities allow teachers to use their time to examine and correct student learning problems or consult with students individually so that learning is no longer sourced from the teacher. (Krahenbuhl, 2016). In other words, suitable learning media will improve the quality of learning and student learning outcomes (Hannafin & Land, 2000).

The use of learning media in the context of the latest learning is undoubtedly relevant to the demands of progress in today's digital technology field. The pace of social change supported by information technology transforms learning media into media with more complete features (Turmudi, 2020). A computer device can integrate audio and visuals but separately present sound, image, and video recordings (C. Huang, 2005). In the classroom learning context, teachers have many choices for developing learning media to suit the various learning styles of their students. The teacher can provide a learning process that combines text, graphics, sound, and video in presentation software with the correct selection of learning materials, making the learning process more successful (M. Rahmawati & Suryadi, 2019). There are various options for learning multimedia that can be generated in the

Nabung (2023)

context of classroom learning in addition to presentation media, including flash-based interactive multimedia that offers more comprehensive functionality than the PowerPoint application software. As a result, having various options will make it simple for teachers to select interactive learning media that are more useful and applicable and can be combined with other learning media (Fajrina et al., 2018).

Most of the learning process still employs the lecture technique and chalkboard materials, according to learning activities in several vocational schools in East Nusatenggara. Learning loses its appeal because so few teachers make use of PowerPoint presentations. Teachers still need to have a say in whether or not to employ interactive media, and the time given does not correspond to the density of the material presented. Since students are rarely seen actively participating in the learning process, effective and efficient learning communication is frequently not achieved. Additionally, the teacher's ignorance of the use of ICT in the learning process has prevented ICT from being fully integrated into the learning process. (Pelgrum, 2001).

Teachers can employ various tactics to raise the standard of students' school-based learning outcomes. In the current digital age, multimedia-based learning is more interactive. Both students and teachers will benefit immensely from a wide variety of digital learning resources to advance their knowledge and abilities. Students may learn more quickly and thoroughly using interactive learning multimedia (Tahounehchi, 2021). According to the teaching materials, constraints, and evaluation methods, learning designs can be organized systematically and attractively to achieve the desired competencies. This way, the use of interactive learning multimedia can result in changes or improvements in student behavior and skills (Wiyono et al., 2021).

Based on observations and interviews with English leaders and teachers in the sample areas of this study, various initial descriptions were revealed. The cause of students' difficulties in learning English is learning, which tends to be understanding abstract material. Student learning difficulties are also influenced by several factors, including; lack of concentration while studying. Students are seen talking to themselves when learning takes place. Some students need to be more serious about participating in learning and disturbing their friends in their seats because the learning process cannot attract students' attention (Lee & Liang, 2012). If this situation continues, the student concerned will miss lessons and impact learning outcomes. It can interfere with the learning achievements of other students. The

factors that affect student learning difficulties, of course, impact the achievement of student learning outcomes (J. Huang, 2005).

In many aspects, an introduction to student learning styles will help teachers understand student character. Like learning styles, student characteristics also tend to influence learning outcomes. Because of that, teachers need to know students' character, especially related to the application of project-based learning, problem-based, or other types of collaborative learning (Nabung et al., 2022). Students in this set come from a variety of backgrounds, which may have an impact on the way they learn and how well they retain information. Students' characteristics fall under the learning design domain of learning technology. According to some academics, a learner's characteristics are those aspects of their experiential background that impact how well they learn.

In contrast, a student's characteristics are the experiences they have had in the past that may have an impact on how well they learn. The experience that students have includes their fundamental knowledge, level of intelligence, emotions, drive to learn, and learning preferences that may impact how well they learn (Jegatha Deborah et al., 2014)(Paulsen & McCormick, 2020)(Sinatra & Mason, 2013). The student's learning style is one factor that significantly affects performance, and students' processing of the information they are given depends on their learning styles. Students primarily use three learning modalities—visual, auditory, and kinesthetic—to extract information during the learning process.

The dynamics of learning media use and student learning preferences significantly impact choosing the best interactive media for students (Xiao, 2006). The instructor must speak up immediately if they feel a specific teaching strategy needs to be corrected for a student's learning preferences. One approach is to assess the procedure's efficiency and the students' learning results. In this scenario, if there is a tendency for students not to pay attention, it will be high, so the learning messages that the teacher will deliver to students tend to be off-target or uninteresting (Sannino, 2010). According to the problem statement above, it is essential to have media that can support teachers in delivering English learning materials relating to the material to be taught in the current semester and help students achieve better learning outcomes. The challenge is determining how much the usage of interactive multimedia in the classroom can enhance student learning results.

This study elaborates on the above question by selecting flash-based interactive multimedia. This choice is based on the belief that Flash application programs enable the integration of text, images, sound, video, and animation in an interactive multimedia program.

Flash-based interactive multimedia is also equipped with practice questions for evaluation and discussion so students can use it independently. Flash-based interactive multimedia can also accommodate differences in student learning styles so that the maximum learning process will improve student learning outcomes. The elaboration of the results of this research will be clearly illustrated in the expected results and further discussion.

METHOD

Design

This research uses a quantitative approach because it is considered more accessible to analyze data using numbers, making it easier to measure the achievement of research objectives (Punch, 2003). A quasi-experimental design with a nonequivalent control group design was used in this investigation. This study employs a quasi-experimental approach, which is frequently employed, mainly when grouping people randomly is impossible or challenging. This is so because researchers cannot control the influence of internal and external factors on the variables they are studying. Because of uncertainties over this equivalency, this design is known as the Randomized Control Group Pretest/Post-test Design (Oakes & Feldman, 2001).

Participant

Students who are the study's subjects make up this study's population. The control class consisted of 36 students from Class XI Vocational Schools of SMK Swakarsa and SMK Karya Ruteng, while the experimental class was 29 students. Data on student learning outcomes were gathered using exam questions and observation sheets for student activities. Pretest, treatment, post-test, and assessment were the research tools utilized in this study to ascertain the outcomes, variations, and influence of interactive multimedia learning. A questionnaire was used to ascertain the learning preferences of the participants (Marzban, 2011). Before the research instrument is used, it is tested with test validation by the expert and then tested.

Instrument

Research instruments that have passed validity and reliability testing are used to gather and process research data. Two different activities were used to collect the data, with the first

activity taking place in the experimental class. Lecture and assignment is the typical learning model. The researcher used the t-test formula to assess the data. In order to determine the association between a specific variable and the other variables acquired, this research employs a quantitative technique using a quasi-experimental kind of research (Bridges et al., 1998).

In this study, 65 students made up the sample, with 30 having visual learning styles, 20 having auditory learning styles, and 15 having kinesthetic learning types. The sample for this study was split into two groups that received treatment utilizing various learning media, including interactive multimedia learning English Flash for 29 students in the experimental group and PowerPoint presentation media for 36 students in the control group. The normality test, homogeneity test, and hypothesis testing were the tests employed in this study.

Data collection

The data gathering techniques were tests and non-tests, depending on the research strategy and model used and the circumstance and field settings used as the study's objects. Data on the success of informal learning is gathered using the test method. Both the pretest and the post-test of the instrument are learning achievement tests. While the post-test was designed to gauge comprehension after the action was provided, the pretest was used to gauge initial mastery of the conversational subject. This test's question sheet uses a grid of previously prepared questions. In contrast, the non-test method measures interest in learning and the level of activity of teachers and students.

Data analysis

The normality test was conducted to test whether the research data were normally distributed. The hypothesis test was used to identify differences in English learning outcomes between students with visual, auditory, and kinesthetic learning styles. The homogeneity test was used to identify the sample from the population of two homogenous groups. The disparities in English learning outcomes between groups of students taught using PowerPoint presentation media and flash-based interactive multimedia learning should also be discovered, as should the relationship between employing interactive multimedia learning and students' learning preferences.

RESULT AND DISCUSSION

Result

In this study, before applying the learning media, the pretest results showed that the average value of student learning outcomes in the control school was 53.51 and 55.83 in the

Nabung (2023)

experimental school (as shown in Table 1 below). These results indicate that the average value of the control and experimental groups is below the predetermined KKM/MCC value of 70. It shows that the students need more satisfactory learning outcomes in English. After the application of learning media, there was a change in the results, namely an increase in student learning outcomes in the control and experimental groups. The average value of the control group is 74.69, and the average value of the experimental group is 73.78. This value indicates that student learning outcomes in each group experienced a significant increase. Thus, it can be confirmed that interactive learning multimedia positively influence student learning outcomes.

Table 1. Conditions of complete English learning before and after the use of interactive multimedia learning

Treatments	MCC*	Pretest	Post-test	Diff. gap
Control School	70	53,51	74,69	21,18
Experiment School	70	55,83	73,78	17,95

*MCC (minimum completeness criteria)

Table 2. Categorization of students based on learning styles in the two treatment groups

Learning Styles	Visual	Auditory	Kinesthetic	Total
Control School	15	15	6	36
Experiment School	12	12	5	29

This study, as illustrated in Table 3 below, shows that implementing the multimedia learning approach in study groups with each learning style provides significant differences in results. It means that there is a significant increase in learning outcomes for each student with a positive learning style background, as seen from the conditions before (ante) and after (post) the application of interactive multimedia learning in each group of respondents in this study. The pretest results on student learning styles showed that the average value of student learning outcomes in the control group with visual learning styles was 57.60 and 60.21 in the experimental group. Student learning outcomes in the control group with auditory learning style were 55.63 and 54.59 in the experimental group. Student learning outcomes in the control group with kinesthetic learning styles were 47.29 and 52.70 in the experimental group.

These results indicate that the average value of the control and experimental groups is below the KKM value set by the subject teacher, which is 70. This shows that the students need more satisfactory learning outcomes. After applying the media, there was an increase in student learning outcomes, both in the control and experimental groups. The average post-test scores of the control group with visual learning style were 74.32 and 76.12 in the experimental group. Students in the control group with auditory learning style were 74.77 and

72.97 in the experimental group. In comparison, the control group students with kinesthetic learning styles were 74.98 and 72.25 in the experimental group. This value indicates that student learning outcomes in the experimental group with visual, auditory, and kinesthetic learning styles have increased in learning outcomes.

Table 3 Comparison of learning outcomes of the two groups with a variety of learning styles before (ante) and after (post) the application of interactive multimedia learning

Learning style (Av. Score)	Visual		Auditory		Kinesthetic		MCC*
	<i>Ante</i>	<i>post</i>	<i>Ante</i>	<i>post</i>	<i>Ante</i>	<i>post</i>	
Control School	57,60	74,32	55,63	74,77	47,29	74,98	70
Experiment School	60,21	76,12	54,59	72,97	52,70	72,25	70

*MCC (minimum completeness criteria)

According to the statistical test results, pupils' success in learning English varies significantly depending on their preferred learning styles (visual, auditory, and kinesthetic). The second study hypothesis is examined and can be approved using the SpSS data processing program, as evidenced in the Anova test that H₀ is accepted and H_a is rejected. In light of these findings, students' learning outcomes for English vary depending on their preferred learning method (visual, auditory, and kinesthetic). This suggests that variances impact the degree of student learning outcomes in learning styles. One aspect of students' acquisition of information, knowledge, and abilities is the variety of their learning styles. The effectiveness of the learning process and the outcomes also vary simultaneously due to students' propensity for using various learning modes. In other words, one of the traits that can affect how well students learn is their learning style.

The Anova test used in this study to determine the impact of interactive learning multimedia and learning preferences on student learning outcomes yielded a significant value of 0.009 (0.009 0.05), which is less than 0.05. Based on this comparison, it can be inferred that interactive multimedia learning and students' preferred learning methods impact the students' learning results. H₀ is approved, and H_a is denied, according to an Anova test.

The summary of the research findings makes it abundantly evident that using interactive multimedia effectively can boost students' enthusiasm for learning English. The findings of this study are consistent with those of earlier studies, which showed that interactive multimedia learning innovations increase students' interest in and motivation for learning both in and outside of the classroom (Kridalukmana & Martono, 2019)(Hasan, 2021). Interactive multimedia or learning materials might increase students' motivation to learn and function as a catalyst for their desire to do so. This study showed that students' attention spans grew longer and that the learning environment was more conducive and laid-back. This

Nabung (2023)

circumstance is anticipated to ensure that learning occurs engaging, effectively, and efficiently.

Installing an interactive multimedia learning strategy has improved the learning process and led to a rise in several elements, including interest, learning outcomes, student activities, and instructor activities. It has improved student learning outcomes. According to the summary of the research findings, interactive multimedia and other types of media, like songs and videos, helps enhance English learning outcomes. According to findings from earlier studies, interactive multimedia-enhanced learning environments produce much higher learning outcomes for students than traditional learning environments or environments without such resources (Hsiao et al., 2016). Furthermore, it is explained that interactive multimedia can be developed and used for all school levels, especially for students with learning problems.

The findings of the statistical tests conducted for this study show that using learning media significantly alters the learning outcomes for students. According to the results of the Anova test, H₀ can be accepted. Thus, including interactive English learning multimedia in the teaching and learning process dramatically impacts how well students learn the language. This result is consistent with earlier studies by several scholars, which concluded that multimedia helps students' academic performance in social science topics (Cutrim Schmid, 2008)(Sun & Hsieh, 2018). Accordingly, Kusuma et al. (2015) concluded that multimedia flash enhances students' learning results when studying the natural sciences (Biology). The use of multimedia in learning can facilitate and boost teacher motivation in delivering learning and increase student learning outcomes, according to the study's findings (Liu et al., 2010).

This result is consistent with the previous study, which found that using multimedia to consider students' learning preferences can result in better learning outcomes than using multimedia in a way that does not (Surjono, 2015). Similarly, learning preferences can influence how well students learn. This assertion is consistent with the earlier revision (Liu et al., 2010). Research findings show that changing pupils' learning approaches and styles can improve their potential and learning capacities (Bhattacharyya & Shariff, 2014).

This study's findings suggest that interactive multimedia learning and learning preferences influence students' learning outcomes. This effect demonstrates how the two variables influence student learning outcomes simultaneously. This conclusion is supported

by the results of the first hypothesis test, which found that the diversity of student learning styles significantly affects student learning outcomes. The second hypothesis, which found that interactive multimedia learning positively affects student learning outcomes, supports the first hypothesis (Adamczyk et al., 2009).

Properly using interactive multimedia can increase interest and learning outcomes in learning EFL in class XI Swakarsa Vocational School in 2020/2021. When interactive multimedia is appropriately used, it is adapted to the needs and traits of the subject matter, the personalities of the students, and the predetermined learning goals. According to the study, the number of pupils interested in learning increased at each meeting. Similarly, practical, interactive multimedia usage can enhance students' English learning outcomes, and the percentage of complete learning provides evidence of improved learning outcomes. This rise is undoubtedly attributable to advancements in the educational process, one of which is the enhancement of instructional media, in this case, interactive multimedia combined with other media like music and videos (Arifin et al., 2021).

Although interactive multimedia can boost EFL students in class XI at Karya Vocational School's interest and learning outcomes in 2020–2021, this does not imply that the study's findings can be applied to other classes or disciplines. Learning media selection should be based on student appeal and effectiveness rather than sophistication (Mahdi, 2022). Therefore, a teacher is expected to choose the suitable media correctly and vary the media use so that all student learning styles can be covered.

CONCLUSION, LIMITATION, AND IMPLICATION

Conclusion

Based on the findings of this study, there is a dynamic relationship between the level of success in learning EFL and the usage of interactive multimedia and an awareness of students' learning preferences. The two factors have significantly altered student achievement, particularly in English learning. The results of this study provide some recommendations and expectations for future users and researchers to enhance the dynamics and learning options that are more engaging. How students learn at school significantly impacts their ability to speak and write in English.

Limitation

This study demonstrate the advantages of employing multimedia learning, which supports improving students' motivation, lowering learning boredom, and enhancing students' attention to learning. There are still limited perspectives and field experiments regarding other

Nabung (2023)

issues related to improving students' learning outcomes, primarily due to regional conditions in Indonesia. Thus, further study is undoubtedly needed, especially in light of how increased interest and motivation are assessed and tested in actual learning outcomes; are learning report cards significantly more numerous, or has student engagement in learning changed?

Implication

The study implies some issues to address. *First*, for English teachers, using interactive multimedia learning in the learning process is recommended. *Second*, for schools, it is recommended to play an active role by involving teachers in various competency training on the use of multimedia technology devices in managing the school learning process, among others, periodically providing training on the development of information technology-based learning media in the form of interactive learning multimedia or other similar multimedia, to teachers. *Third*, future researchers should conduct research by collaborating on interactive multimedia learning and specific learning models by considering students' learning styles, in addition to visual, auditory, and kinesthetic, covered in this research.

ACKNOWLEDGEMENT

I convey my highest gratitude and appreciation to the management of the Institute for Research and Community Service (LPPM), Unika St. Paulus Ruteng, for the full financial support for all stages of proposal submission, the field research process, until supporting the financing of the publication of this research results in the form of a journal article.

BIO-PROFILE:

Adrianus Nabung holds his Bachelor of Philosophy (in English Education Philosophy) from IFTK Ledalero and his master's degree in ELT from Universitas Indraprasta Jakarta. He is now pursuing his English Education Lecturing Programs at the English Education Study Program, Faculty of Teacher Training and Education Sciences, Universitas Katolik Indonesia Santu Paulus Ruteng. Corresponding email: adrianusnabung@gmail.com

REFERENCES

- Adamczyk, C., Holzer, M., Putz, R., & Fischer, M. R. (2009). Student learning preferences and the impact of a multimedia learning tool in the dissection course at the University of Munich. *Annals of Anatomy - Anatomischer Anzeiger*, 191(4), 339–348. <https://doi.org/10.1016/j.aanat.2009.03.003>
- Aghni, R. I. (2018). Fungsi dan jenis media pembelajaran dalam pembelajaran akuntansi. *Jurnal Pendidikan Akuntansi Indonesia*, 16(1), 98–107. <https://doi.org/10.21831/jpai.v16i1.20173>
- Arifin, Z., Tegeh, I. M., & Yuda Sukmana, A. I. W. I. (2021). Independent learning through interactive multimedia based on problem-based learning. *Jurnal Edutech Undiksha*, 9(2), 244. <https://doi.org/10.23887/jeu.v9i2.41292>
- Ayersman, D. J. (1996). Reviewing the research on hypermedia-based learning. *Journal of Research on Computing in Education*, 28(4), 500–525. <https://doi.org/10.1080/08886504.1996.10782180>
- Bhattacharyya, E., & Shariff, A. B. M. S. @. (2014). Learning style and its impact on higher education and human capital needs. *Procedia - Social and Behavioral Sciences*, 123, 485–494. <https://doi.org/10.1016/j.sbspro.2014.01.1448>
- Bisnis, J. A. (2018). Bahasa inggris sebagai bahasa lingua franca dan posisi kemampuan bahasa inggris masyarakat indonesia diantara anggota MEA. *Prosiding Industrial Research Workshop and National Seminar*, 9, 776–783. <https://jurnal.polban.ac.id/ojs-3.1.2/proceeding/article/view/1149>
- Boekaerts, M., & Niemivirta, M. (2000). Self-regulated learning: Finding a balance between learning goals and ego-protective goals. In *Handbook of self-regulation* (pp. 417–450). Elsevier. <http://search.ebscohost.com/login.aspx?direct=true&db=psych&AN=2001-01625-012&lang=it&site=ehost-live%5CnBoekaerts, Niemivirta 2000 - Self-regulated learning.pdf>
- Bridges, G. S., Gillmore, G. M., Pershing, J. L., & Bates, K. A. (1998). Teaching quantitative research methods: A quasi-experimental analysis. *Teaching Sociology*, 26(1), 14–28. <https://doi.org/10.2307/1318676>
- Cholis Sa'dijah, A. R. A. (2021). Kesiapan guru melaksanakan pembelajaran berbasis HOTS ditinjau dari pengetahuan dan kemampuan mengemas perangkat pembelajaran. *PADARINGAN (Jurnal Pendidikan Sosiologi Antropologi)*, 3(2), 402. <https://doi.org/10.20527/padaringan.v3i2.3422>
- Cutrim Schmid, E. (2008). Potential pedagogical benefits and drawbacks of multimedia use in the English language classroom equipped with interactive whiteboard technology. *Computers & Education*, 51(4), 1553–1568. <https://doi.org/10.1016/j.compedu.2008.02.005>
- Dağ, F., & Geçer, A. (2009). Relations between online learning and learning styles. *Procedia - Social and Behavioral Sciences*, 1(1), 862–871. <https://doi.org/10.1016/j.sbspro.2009.01.155>
- Dehghayedi, M., & Bagheri, M. S. (2019). An exploratory interplay of efl teachers' reflection and their teaching and learning beliefs. *International Journal of Language Education*, 3(2), 78–90. <https://doi.org/10.26858/ijole.v3i2.9527>

- Fajrina, W., Simorangkir, M., & Nurfajriani, D. (2018). Developing interactive computer based learning media of lectors inspire to enhance conceptual skills of senior high schools students. *3rd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2018)*, 57–60. <https://doi.org/10.2991/aisteel-18.2018.12>
- Fransisca, M., Yunus, Y., Dewi Sutiasih, A., & Permata Saputri, R. (2019). Practicality of e-learning as learning media in digital simulation subjects at vocational school in padang. *Journal of Physics: Conference Series*, 1339(1), 012077. <https://doi.org/10.1088/1742-6596/1339/1/012077>
- Franzoni, A. L., & Assar, S. (2009). Student learning styles adaptation method based on teaching strategies and electronic media. *Educational Technology and Society*, 12(4), 15–29.
- Hannafin, M. J., & Land, S. M. (2000). Technology and student-centered learning in higher education: Issues and practices. *Journal of Computing in Higher Education*, 12(1), 3–30. <https://doi.org/10.1007/BF03032712>
- Hasan. (2021). Publikasi ilmiah bagi guru sekolah : *Cross-Border*, 4(2), 154–164.
- Hoinbala, F. R. (2022). Movies as an authentic input in l2 speaking class: A Dynamic Usage-Based Approach in EFL Teaching in Indonesia. *International Journal of Language Education*, 6(1), 1–9. <https://doi.org/10.26858/ijole.v6i1.20196>
- Hsiao, C.-C., Tiao, M.-M., & Chen, C.-C. (2016). Using interactive multimedia e-Books for learning blood cell morphology in pediatric hematology. *BMC Medical Education*, 16(1), 290. <https://doi.org/10.1186/s12909-016-0816-9>
- Huang, C. (2005). Designing high-quality interactive multimedia learning modules. *Computerized Medical Imaging and Graphics*, 29(2–3), 223–233. <https://doi.org/10.1016/j.compmedimag.2004.09.017>
- Huang, J. (2005). A diary study of difficulties and constraints in EFL learning. *System*, 33(4), 609–621. <https://doi.org/10.1016/j.system.2005.04.001>
- Huang, Q. (2022). Classroom activities, classroom anxiety and teacher roles : three dimensions revealing class reality of a university english course. *The Journal of AsiaTEFL*, 19(2), 431–450. <https://doi.org/10.18823/asiatefl.2022.19.2.3.431>
- Ishartono, N., Faiziyah, N., Sutarni, S., Putri, A. B., Fatmasari, L. W. S., Sayuti, M., Rahmaniati, R., & Yunus, M. M. (2021). Visual, auditory, and kinesthetic students: How they solve pisa-oriented mathematics problems? *Journal of Physics: Conference Series*, 1720(1), 012012. <https://doi.org/10.1088/1742-6596/1720/1/012012>
- Jarvis, P. (2012). Paradoxes of learning. In *paradoxes of learning: on becoming an individual in society*. Routledge. <https://doi.org/10.4324/9780203802700>
- Jegatha Deborah, L., Baskaran, R., & Kannan, A. (2014). Learning styles assessment and theoretical origin in an E-learning scenario: a survey. *Artificial Intelligence Review*, 42(4), 801–819. <https://doi.org/10.1007/s10462-012-9344-0>
- Kartika Rini, D., Suryaman, & Yoso, W. (2019). Pengembangan media pembelajaran interaktif bahasa inggris melalui aplikasi kahoot siswa kelas VII SMP Negeri 1 Rembang Kab. Pasuruan. *Jurnal Education and Development*, 7(2), 261–267. <http://journal.ipts.ac.id/index.php/ED/article/view/1017>

- Krahenbuhl, K. S. (2016). Student-centered education and constructivism: Challenges, concerns, and clarity for teachers. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 89(3), 97–105.
- Kridalukmana, R., & Martono, K. T. (2019). Pembelajaran bahasa inggris berbasis teknologi komunikasi dan informasi melalui penerapan multimedia pembelajaran. *Jurnal Pendidikan Bahasa Inggris*, 4(1), 102–108.
- Kruk, M. E., Gage, A. D., Arsenault, C., Jordan, K., Leslie, H. H., Roder-DeWan, S., Adeyi, O., Barker, P., Daelmans, B., Doubova, S. V, English, M., García-Elorrio, E., Guanais, F., Gureje, O., Hirschhorn, L. R., Jiang, L., Kelley, E., Lemango, E. T., Liljestrang, J., ... Pate, M. (2018). High-quality health systems in the Sustainable Development Goals era: time for a revolution. *The Lancet Global Health*, 6(11), e1196–e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- Kusuma, P. S., Chamisijatin, L., & Nurwidodo. (2015). Pengaruh macromedia flash terhadap hasil belajar siswa Kelas X IPA SMA Negeri 4 Pasuruan. *Peran Biologi Dan Pendidikan Biologi Dalam Menyiapkan Generasi Unggul Dan Berdaya Saing Global*, 386–394. [http://biology.umm.ac.id/files/file/386-394 Pranoto Sakti Kusuma.pdf](http://biology.umm.ac.id/files/file/386-394%20Pranoto%20Sakti%20Kusuma.pdf)
- Lee, Y. J., & Liang, J.-C. (2012). Using video technology to diagnose EFL students' cognitive learning difficulties in public speaking. *Procedia - Social and Behavioral Sciences*, 64, 671–680. <https://doi.org/10.1016/j.sbspro.2012.11.079>
- Lim, Y.-J., Kim, H.-K., & Lee, T. J. (2016). Visitor motivational factors and level of satisfaction in wellness tourism: comparison between first-time visitors and repeat visitors. *Asia Pacific Journal of Tourism Research*, 21(2), 137–156. <https://doi.org/10.1080/10941665.2015.1029952>
- Liu, I.-F., Chen, M. C., Sun, Y. S., Wible, D., & Kuo, C.-H. (2010). Extending the TAM model to explore the factors that affect intention to use an online learning community. *Computers & Education*, 54(2), 600–610. <https://doi.org/10.1016/j.compedu.2009.09.009>
- Lotulung, C. F., Ibrahim, N., & Tumurang, H. (2018). Effectiveness of learning method contextual teaching learning (CTL) for increasing learning outcomes of entrepreneurship education. *The Turkish Online Journal of Educational Technology - TOJET*, 17(3), 37–46.
- Ma, R., & Oxford, R. L. (2014). A diary study focusing on listening and speaking: The evolving interaction of learning styles and learning strategies in a motivated, advanced ESL learner. *System*, 43(1), 101–113. <https://doi.org/10.1016/j.system.2013.12.010>
- Mahdi, D. A. (2022). Improving speaking and presentation skills through interactive multimedia environment for non-native speakers of English. *SAGE Open*, 12(1), 21582440221079812. <https://doi.org/10.1177/21582440221079811>
- Marzban, A. (2011). Improvement of reading comprehension through computer-assisted language learning in Iranian intermediate EFL students. *Procedia Computer Science*, 3, 3–10. <https://doi.org/10.1016/j.procs.2010.12.003>
- Mensah Hervie, D. (2018). Enhancing teachers' performance through training and development in Ghana education service (A Case Study of Ebenezer Senior High School). *Journal of Human Resource Management*, 6(1), 1. <https://doi.org/10.11648/j.jhrm.20180601.11>
- Nabung, A., Ni, L., & Edu, A. L. (2022). An Analysis of the digital transformation-based learning implementation system in the era of disruption. *Jurnal Basicedu*, 6(3), 4265–

4271. <https://doi.org/10.31004/basicedu.v6i3.2799>
- Nguyen, L. V., & Pham, A. T. D. (2021). Using synchronous online discussion to develop EFL learners' productive skills: A case study. *Journal of Asia TEFL*, 18(1), 179–207. <https://doi.org/10.18823/asiatefl.2021.18.1.11.179>
- Oakes, J. M., & Feldman, H. A. (2001). Statistical power for nonequivalent pretest-posttest designs. *Evaluation Review*, 25(1), 3–28. <https://doi.org/10.1177/0193841X0102500101>
- Papastergiou, M. (2009). Digital game-based learning in high school computer science education: Impact on educational effectiveness and student motivation. *Computers and Education*, 52(1), 1–12. <https://doi.org/10.1016/j.compedu.2008.06.004>
- Paulsen, J., & McCormick, A. C. (2020). Reassessing disparities in online learner student engagement in higher education. *Educational Researcher*, 49(1), 20–29. <https://doi.org/10.3102/0013189X19898690>
- Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers and Education*, 37(2), 163–178. [https://doi.org/10.1016/S0360-1315\(01\)00045-8](https://doi.org/10.1016/S0360-1315(01)00045-8)
- Punch, K. F. (2003). *Survey research: The basics*. Sage.
- Rahmawati, R., & Suryadi, E. (2019). Kreativitas mengajar guru dan komunikasi interaksional sebagai determinan terhadap prestasi belajar siswa. *Jurnal Pendidikan Manajemen Perkantoran*, 4(2).
- Ramadian, O. D., Cahyono, B. Y., & Suryati, N. (2020). The Implementation of visual, auditory, kinesthetic (VAK) learning model in improving students' achievement in writing descriptive texts. *English Language Teaching Educational Journal*, 2(3), 142. <https://doi.org/10.12928/eltej.v2i3.946>
- Saleh, S., Wekkeng, A. E. T., Nasrullah, M., Jamaluddin, J., & Nasaruddin, H. (2020). The effectiveness of the utilization of learning media in the OTKP Department at SMKN 1 Makassar. *Jurnal Ad'ministrare*, 7(2), 301–310.
- Sannino, A. (2010). Teachers' talk of experiencing: Conflict, resistance and agency. *Teaching and Teacher Education*, 26(4), 838–844. <https://doi.org/10.1016/j.tate.2009.10.021>
- Sinatra, G. M., & Mason, L. (2013). International handbook of research on conceptual change. In S. Vosniadou (Ed.), *International Handbook of Research on Conceptual Change* (Vol. 2). Routledge. <https://doi.org/10.4324/9780203154472>
- Sun, J. C.-Y., & Hsieh, P.-H. (2018). Application of a gamified interactive response system to enhance the intrinsic and extrinsic motivation, student engagement, and attention of English learners. *Journal of Educational Technology & Society*, 21(3), 104–116.
- Surjono, H. D. (2015). The effects of multimedia and learning style on student achievement in online electronics course. *Turkish Online Journal of Educational Technology*, 14(1), 116–122.
- Tahounehchi, S. (2021). The impact of mobile technology on vocabulary learning of L2 learners: The case of whatsapp application. *Journal of Asia TEFL*, 18(1), 223–234. <https://doi.org/10.18823/asiatefl.2021.18.1.13.223>
- Tsang, A., Paran, A., & Lau, W. W. F. (2020). The language and non-language benefits of literature in foreign language education: An exploratory study of learners' views.

- Language Teaching Research*, 00(0), 1–22. <https://doi.org/10.1177/1362168820972345>
- Turmudi, D. (2020). English scholarly publishing activities in the industrial revolution 4 . 0 : What , Why , and How ? *ELTEJ*, 3(1), 52–63.
<http://journal2.uad.ac.id/index.php/eltej/article/view/1890>
- Wiyono, B. B., Indreswari, H., & Prestiadi, D. (2021). The use of technology-based communication media in the teaching-learning interaction of educational study programs in the pandemic of covid 19. *ICEIEC 2021 - Proceedings of 2021 IEEE 11th International Conference on Electronics Information and Emergency Communication*, 103–107. <https://doi.org/10.1109/ICEIEC51955.2021.9463846>
- Xiao, L. (2006). Bridging the gap between teaching styles and learning styles: a cross-cultural perspective. *Tesl-Ej*, 10(3), 1–15. <https://tesl-ej.org/~teslejo/ej39/a2.html>