

## Fostering Students' Independent Learning in Introduction to Learning Media Courses through the Use of Interactive Multimedia

Hirnanda Dimas Pradana<sup>1</sup>, Andi Kristanto<sup>2</sup>

[hirnandapradana@unesa.ac.id](mailto:hirnandapradana@unesa.ac.id)<sup>1</sup>

**Abstract:** *The current era is entering a fast-paced and uncertain period. In that era, it has a significant impact on learning. One of the impacts is online learning. However, online learning raises various kinds of problems in its implementation. Student learning independence is one of the problems that arise and must be resolved immediately. If student learning independence cannot be appropriately handled, learning outcomes will also be affected. From the observations, independent learning in students also causes low learning outcomes obtained. Thus, interactive multimedia is here to solve the problem of independent learning in students. Interactive multimedia can help students to learn independently. Interactive multimedia does not only act as a passive means of knowledge but also can be a solution for students to understand introductory learning media courses. The development model used was the Lee & Owens model. The research design in this study was a one-group pretest-posttest design. The results of this study were valid and effective interactive multimedia products and increased student independence. The implication of improving student learning independence ultimately impacts increasing student learning outcomes.*

**Keywords:** *Interactive Multimedia, Independent Learning, Introduction to Learning Media*

**Abstrak:** *Pembelajaran online menimbulkan berbagai macam permasalahan dalam pelaksanaannya. Kemandirian belajar mahasiswa adalah salah satu permasalahan yang muncul dan harus segera diselesaikan. Jika kemandirian belajar mahasiswa tidak dapat tertangani dengan baik, maka hasil belajar juga akan ikut terpengaruhi. Dari hasil observasi, Kemandirian belajar dalam diri mahasiswa menimbulkan pula rendahnya hasil belajar yang diperoleh. Multimedia interaktif hadir untuk menyelesaikan masalah kemandirian belajar dalam diri mahasiswa. Multimedia interaktif dapat membantu mahasiswa untuk belajar secara mandiri. Multimedia interaktif, tidak hanya berperan sebagai sarana pasif dalam pembelajaran. Multimedia interaktif dapat menjadi solusi bagi mahasiswa untuk memahami mata kuliah pengantar media pembelajaran. Model pengembangan yang digunakan ialah model Lee & Owens. Desain penelitian dalam penelitian ini adalah one group pretest posttest design. Hasil penelitian ini berupa produk multimedia interaktif yang valid dan efektif, serta meningkatnya kemandirian mahasiswa. Implikasi dari kemandirian belajar mahasiswa yang meningkat akhirnya berdampak pula meningkatnya hasil belajar mahasiswa.*

**Kata Kunci:** *Multimedia Interaktif, Kemandirian Belajar, Pengantar Media Pembelajaran*

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<sup>1</sup>Teknologi Pendidikan, Universitas Negeri Surabaya, Indonesia

<sup>2</sup>Teknologi Pendidikan, Universitas Negeri Surabaya, Indonesia

## INTRODUCTION

Learning is a series of activities carried out by students and lecturers to achieve the goals that have been set (Faqih and Pratama 2019; Pradana 2021). Learning is required to have clear goals, where students as subjects in learning are directed to complete the material that has been programmed (Astuti and Prestiadi 2020; Sadikin and Hamidah 2020). In addition, the concept of learning in today's uncertain era is done online (Ede and Beanland 2020; Trechsel et al. 2021). Online learning can be progressed if individuals are ready to face the existing situation. Still, not a few also consider online learning as a problem that prevents students from completing learning activities and achieving the learning goals that have been set. Hence, with online learning, innovation is needed to assist students in carrying out online learning activities effectively and efficiently (Rodiyah s2021; Shelle et al. 2018).

Moreover, the teaching and learning activities required to be carried out online can cause various kinds of problems in education. The change in teaching and learning, which was initially face-to-face to learning carried out in cyberspace, requires the readiness of all elements, institutions, lecturers, and students (Shirazi and Heidari 2019; Ziaurrahman and Surjono 2017). In this case, the use of technology has a vital role in online learning that has been carried out at this time, but the use of technology is also one of the main obstacles for all parties to implement distance learning (Ait Si Ahmad, El Kharki, and Berrada 2021; Arifa 2020). With that, it takes a long time and unique strategies for all parties, both lecturers and students, to achieve the learning objectives that have been set.

Online learning significantly also impacts all activities carried out by lecturers and students (AlKhamaiseh 2021; Himanen et al. 2020). One of the impacts is the loss of institutional elements as a medium of interaction between students and lecturers to improve students' skills, sensitivity, and the loss of independent learning. Inadequate facilities can also be used as one of the causes of the lack of student motivation in online learning activities (Ekowati, Samo, and Njuka 2021; Wahyugi and Fatmariza 2021). In online learning, students only sit quietly in front of the laptop while listening to the explanation from a lecturer. It makes learning boring, and students cannot study independently (Purwitaningrum and Prahmana 2021; Utomo et al. 2021). It is the beginning of other problems that come in online learning (Aristovnik et al. 2020; Chick et al. 2020). Thus, issues in online learning require innovation as an effort to solve them.

Further, various problems are present in online learning (Irwanto et al. 2019; Kapasia et al. 2020). From the observations, many students had difficulty learning the introduction of learning media related to the concept of learning media and classification in learning media. It happened because students always relied on what was conveyed by the lecturer in the virtual class. Related to that, the independent learning attitude has not been adequately nurtured in online learning (Sumbawati et al. 2020; Winarti et al. 2021), especially in introductory learning media courses. With the low learning independence in students, the students' curiosity about a learning material is also intense. It has then a significant impact on students' understanding of the learning material provided by the lecturer (Khairini, Khaldun, and Pada 2021; Putri H. and Wulandari 2021).

The introductory subject of learning media is an essential course for students of the Education Technology Study Program at the State University of Surabaya. As prospective learning technologists and developers of learning media, education technology students should understand well about learning media. The introductory learning media course is to become the initial foundation for students to become learning technologists and learning media developers. Introduction to learning media is the essential foundation for education technology students. If students cannot complete this course, it is

predicted that other classes will fail as well. These problems, therefore, must be resolved immediately, not to have a fatal impact on student learning progress.

On the other side, there are more and more exciting learning media developments in this digital era, such as visual, audio, and audiovisual media and print media. (Pradana and Kuswandi 2018; Syawaludin, Gunarhadi, and Rintayati 2019). One example of learning media that can accommodate all components, graphic, audio, or video, is interactive multimedia (Karademir et al., 2021; Saifudin, Susilaningsih, and Wedi 2020). Not only the learning media in it, but interactive multimedia also makes students actively involved in interacting in learning activities (Lindner et al., 2021; Yulianci et al., 2021). Interactive multimedia can create an innovation that accommodates all learning media and interactivity between students (Fuady, Sutarjo, and Ernawati 2021; Maknuni 2020). Interactive multimedia has then become a *prima donna* in solving current learning problems with these various innovations. Interactive multimedia can also convey learning material and increase students' sense of independence in their learning (Riznyk 2021; Suryanto, Ariana, and Rizal 2020).

In line with the development of information technology, learning media must also experience increased innovation in the learning process (Mariono et al. 2021; Waljinah et al. 2020). Innovations are needed to improve the quality of learning, create a pleasant teaching and learning atmosphere, and provide comfort for students in their learning activities. One of the innovations in learning is an interactive multimedia (Novianto, Degeng, and Wedi 2018; Zhu et al. 2019). Interactive multimedia has been applied to various fields, including education. Interactive multimedia is also a combination of audio, visual, and audiovisual media put together to teach students (Ahmad 2020; Indah Septiani et al. 2020). Currently, interactive multimedia has been widely used in learning. Multimedia combines various media types, such as text, images, and audio, into a multisensory interactive application or presentation to convey messages or information to an audience (Molina et al., 2018; Suhairi et al. 2020). It is because learning multimedia can accommodate all types of learning media and is also believed to help students in their learning activities (Manurung and Panggabean 2020; Widodo et al. 2020). For students, multimedia learning will make their learning meaningful and help them understand the material well (Nadirah et al. 2020; Praheto et al. 2020). In addition, multimedia learning can also increase learning independence in students. From the empirical observations, online learning tended to be passive in virtual classes and only listened to lecturers' explanations. Apart from being passive, students could not seek knowledge and depend on lecturers. Indeed, good learning should be followed by student activity and student independence in their learning activities.

For this reason, interactive multimedia is an essential tool in learning (Gunawan, Mashami, and Herayanti 2020; Untari et al. 2020). With the presence of interactive multimedia, students will get enlightenment. Students can also learn with interactive multimedia independently because they are free to use multimedia (Baquier Orozco, Barraza Castillo, and Husted Ramos 2020; Nurtanto, Sofyan, and Pardjono 2021). Here, interactive multimedia is a means for students to actively learn (Fatin Shamimi Che Ibrahim et al. 2021; Syafti and Advinda 2021). In addition, interactivity in interactive multimedia makes this media loved by various parties in learning. Learners can learn independently because interactive multimedia is an individual learning medium (Syafti and Advinda 2021; Widyaningsih et al. 2020). Concerning this, learning media should provide interactivity to be appropriately used by students. Hence, the interactive multimedia developed can increase student independence in introductory learning media courses.

## RESEARCH METHODS

Interactive multimedia developed did not suddenly exist and be developed. A good development process requires a variety of stages that are not small. Systematic and well-planned stages are needed so that the interactive multimedia developed can become interactive multimedia right on target and used according to its needs (Abdulah, Mustadi, and Fitriani 2021; Rosalina and Suhardi 2020). The research design used was a one-group pretest-posttest design. The research subjects carried out were students of S1 Educational Technology, State University of Surabaya, totaling 36 students. In addition to students, the development research also involved experts in material and media from the lecturers. Data collection methods used were interviews, questionnaires, and tests.

The developer used the Lee & Owens development model to develop this interactive multimedia. This development model is suitable for developing multimedia products (Kristanto, Sulistiowati, and Pradana 2021; Pamungkas and Azmi 2021). The Lee & Owens development model has five stages that cannot be replaced or transferred: analysis, design, development, implementation, and evaluation. Lee & Owens's development model is devoted to developing multimedia-based learning (Pamungkas and Azmi 2021; Tambunan 2021). Because of this basis, the researcher chose the Lee & Owens development model to carry out various stages in developing appropriate interactive multimedia. The steps of the Lee & Owens development model used by researchers are as follows:

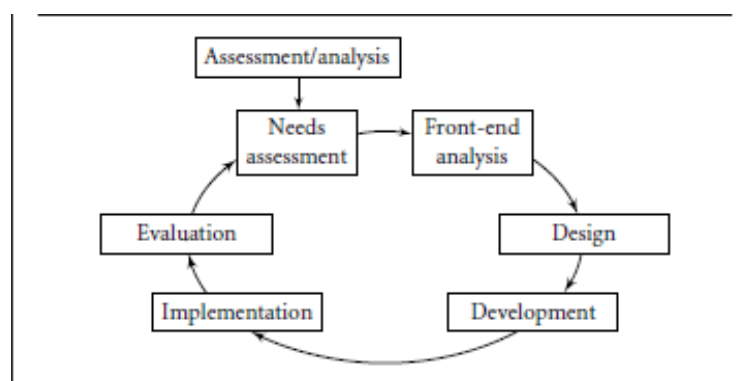


Figure 1. Lee & Owens development model

There are two crucial initial steps in the analysis stage: needs analysis and initial - final analysis. The needs analysis in this study aimed to analyze the gaps between the actual conditions in the field and the expected ideal conditions. This analysis is needed to see how crucial interactive multimedia development is required in the area (Pradana 2021; Pradana and Kuswandi 2018). Besides, the actual conditions in the field revealed students' understanding of the learning material and the lack of learning independence in students. It was because of no media that could help them do online learning. It was also because of no readiness for learning media that students could use to study independently in today's digital era (Erni et al. 2020; Fitriyani, Fauzi, and Sari 2020). Students then had high hopes for innovation in learning media that could help them learn independently and have fun. In addition to needs analysis, the researchers also carried out initial and final analysis activities. Ten kinds of things were analyzed according to the development model proposed by Lee & Owens. The initial - final analysis comprised student analysis, technology analysis, situation analysis, task analysis, issue analysis, critical event analysis, objective analysis, media analysis, existing data, and cost estimation.

The design stage in interactive multimedia development is the second stage that the developer must carry out when referring to the Lee & Owens development model. This design stage is where the developer will carry out the planning of the project he is doing (development of a product). (Aprianto,

Ulfa, and Husna 2021; Sintya, Sutadji, and Djatmika 2020). Activities carried out in this stage include planning schedules, development team, and media specifications. Therefore, this stage is vital because product planning starts from this stage.

The development stage is also crucial because the product has already begun to be created (Armansyah, Sulton, and Sulthoni 2019; Nikolawatin, Setyosari, and Ulfa 2019). In this stage, the developer must focus on running this stage well. In this stage, the developer also creates an initial prototype of a product that will be useful for learning, namely interactive multimedia that elementary school students will use.

Moreover, the developer conducted three trials at the product implementation stage: individual trials, small group trials, and field trials. In the trial phase, the developer got an assessment from the students who used the multimedia. At the implementation stage, the developer received an assessment that the interactive multimedia developed was valid and feasible to use (Nyeneng, Rosidin, and Putri 2020; Rahardjo, Degeng, and Soepriyanto 2019). The scale used was a yes or no choice of the given questionnaire. In this development, the developer evaluated to the formative evaluation stage. Here, formative evaluation is needed/used to determine the quality and quality of the developed teaching materials. Researchers carried out a formative evaluation because it was guided by one of the statements. The data results could be used as a basis for making improvements to the interactive multimedia developed.

## **RESULTS AND DISCUSSION**

The result of developing this product is interactive multimedia, aimed at S1 Educational Technology, State University of Surabaya. Interactive multimedia brought positive changes in learning for S1 Educational Technology, State University of Surabaya's students. Product development in interactive multimedia was based on product needs in learning at the university. Of course, product development in interactive multimedia is needed to be used in learning and can provide a significant increase in learning outcomes for students.

This development resulted in interactive multimedia products. This interactive multimedia is needed in learning at the university level. The interactive multimedia developed is based on mobile devices. The interactive multimedia developed can be run on smartphones. Students can easily carry the interactive multimedia set anywhere with a concept like this. Researchers also hope that interactive multimedia development is expected to quickly help students better understand learning materials (Mualimah, Praherdhiono, and Adi, 2019; Oktaviana, Sari, and Sunarmi 2020). In addition, the result of developing this product is in the form of interactive multimedia aimed at elementary school children. Interactive multimedia brought positive changes in learning for elementary school students. Product development in interactive multimedia was based on product needs in learning at the university. Of course, product development in interactive multimedia is needed to be used in learning and can provide a significant increase in learning outcomes for students. The interactive multimedia developed was also tailored to the needs of students to assist them in learning introductory learning media materials.

To measure the feasibility and effectiveness of this interactive multimedia, the developer collected data from material experts, media experts, and users. The developer carried out validation by asking for an assessment of interactive multimedia from content experts and media experts. In addition to the validation from these experts, the researchers also tested the product on students as the target of the product being developed. The trials carried out were individual, small group, and field trials. These inputs will become material for developers to revise products in the form of interactive multimedia (Andini, Sulton, and Soepriyanto 2019; Gunawan et al. 2020).

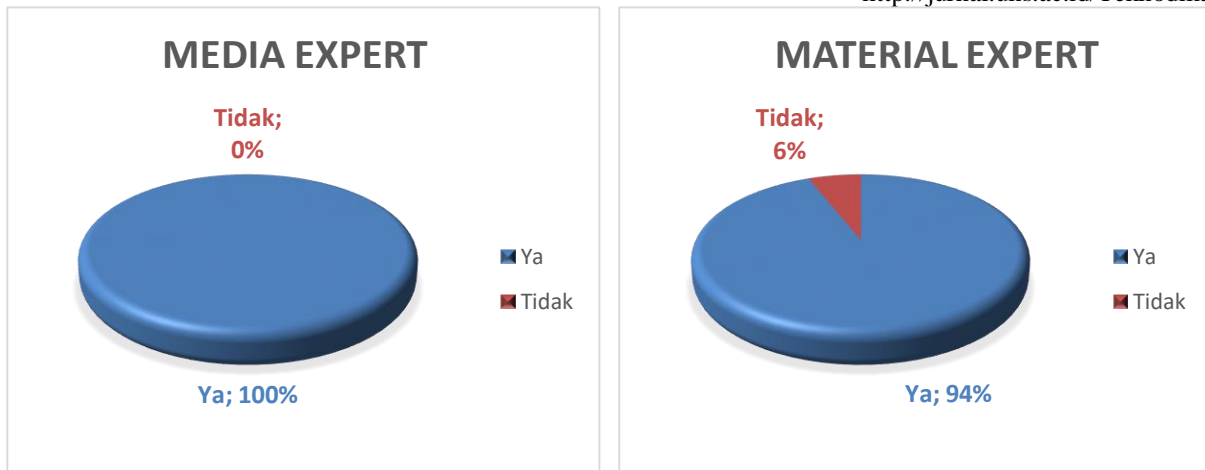


Figure 2. Media and Material Expert's Validation Results

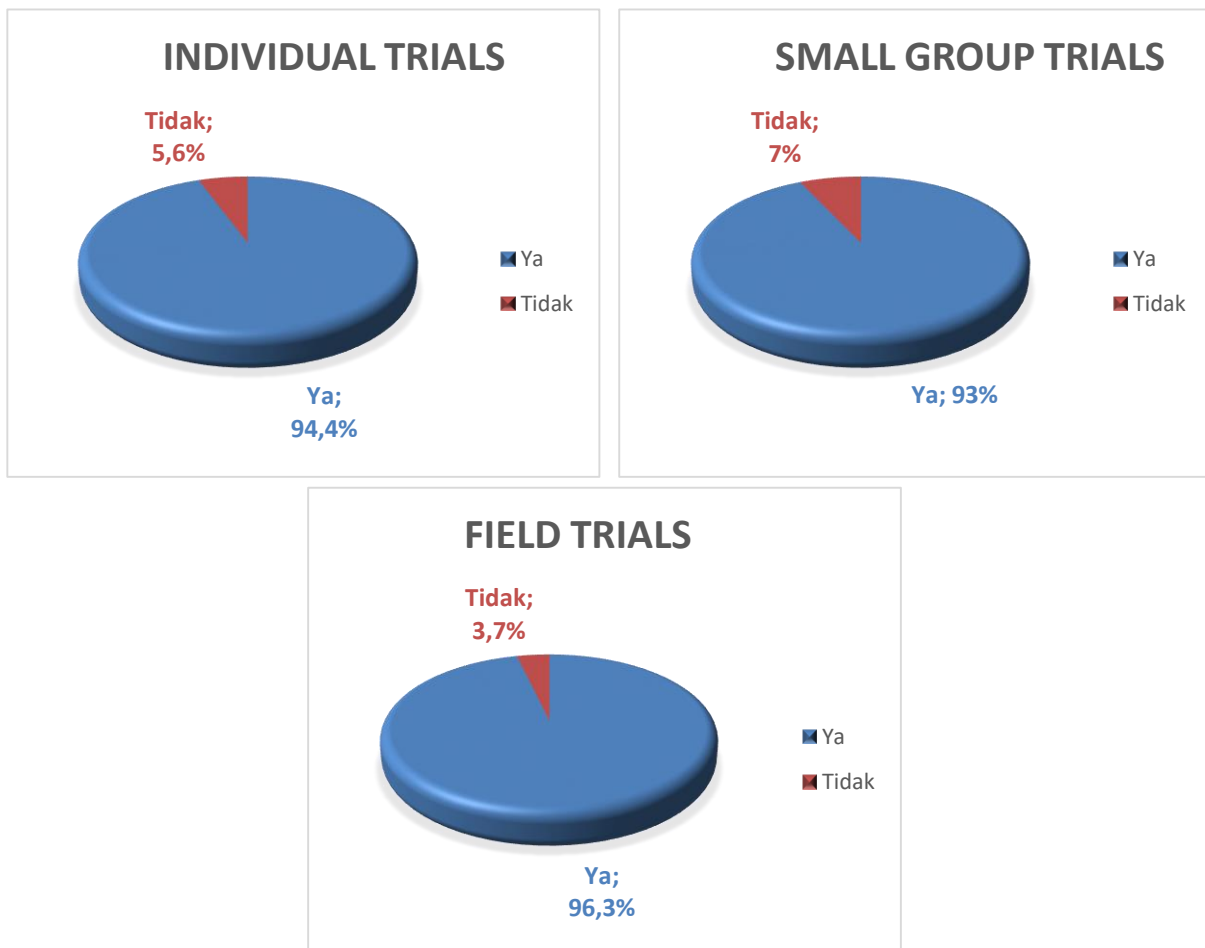


Figure 3. Media Trials Validation's Results

Students used the responses from media experts, material experts, and students to revise the interactive multimedia developed. Revisions made by researchers are helpful so that the interactive multimedia developed can be much better and suitable for use in learning (Isnaeni and Agustina 2018; Prabowo, Sumarni, and Sa'dijah 2019). In addition to the developer's validity and feasibility tests, the interactive multimedia developed also needs to be tested for effectiveness. The interactive multimedia

effectiveness test was conducted by comparing student learning outcomes in the pretest and posttest— validity, feasibility, and effectiveness of interactive multimedia.

First, the researcher validated the product in the form of interactive multimedia along with a user manual for media experts. Based on the assessment of media experts, it was obtained a score of 100% choosing Yes. Thus, interactive multimedia developed is into an excellent category. This assessment was as the basis that, according to media experts, the interactive multimedia products designed were suitable for use by students.

Second, the developer's next validation stage was to obtain an assessment from a material expert. Based on the evaluation of material experts for interactive multimedia, the percentage number was 94% Yes and 6% no and was included in the correct category. Researchers got input from content experts to improve interactive multimedia in a better direction. Information from material experts is that animation should be adapted to the material and explain the classification of types of learning media.

Third, the developer's next stage was to conduct individual trials for students. Personal trials were conducted with three students as the target users of interactive multimedia. From the results of personal trials, the percentage score was 94.4% Yes and 5.6% no and was included in the excellent category. Assessment in individual trials was the basis for the developed media to be tested on small groups to obtain an assessment.

Fourth, the developer conducted a small group trial. In a small group trial, the developer selected six students as targets. The small group trial results obtained a percentage of 93% choosing Yes and 7% choosing no. Assessment in small group trials was a basis for the developed media to be tested on large groups.

Fifth, field trials were the fifth stage carried out by developers. In the field trial phase, the developer assessed 36 students. The interactive multimedia development got a score of 96.3% choosing Yes and 3.7% choosing No. The results of the assessment given could be categorized as very good. From the overall valid review, it can be concluded that the interactive multimedia developed could be categorized as interactive multimedia suitable for use in learning.

In the research and development carried out, in addition to getting data in the form of scores, the researchers also tested the effectiveness of the products developed at this stage. The effectiveness trial was obtained by comparing the students' pretest and posttest scores. The t-test results carried out received a value of 23.98. The deal was consulted with the t-table, with  $N = 36 - 1 = 35$ , with a 95% confidence level, and the t-table was 2.030. The analysis results obtained  $23.98 > 2.030$ . It signifies that student learning outcomes and independence have increased significantly after using interactive multimedia. From the research results above, a statement can be drawn that interactive multimedia developed by researchers was valid and feasible to use. In addition, the interactive multimedia developed could increase students' learning independence and improve the learning outcomes obtained by students.

## **CONCLUSIONS AND RECOMMENDATIONS**

The product developed is in the form of interactive multimedia for elementary school students. The product is interactive multimedia used as an application with a .apk extension that can be installed on a smartphone with an Android operating system. Interactive multimedia is flexible because students can use this interactive multimedia anywhere and anytime. Thus, the use of interactive multimedia is not only in the classroom. This interactive multimedia can also help students master the required

competencies and do the tasks given by the teacher. The goal to be achieved through interactive multimedia is the ability of students to understand the introductory material for learning media. The product resulting from this research and development process is interactive multimedia that students can use independently.

The developer conducted a feasibility and effectiveness test of this developed product to determine the level of achievement of interactive multimedia in helping students in their learning activities. Based on the feasibility test carried out by the developer, material experts, media experts, and students, it can be seen that this interactive multimedia could be categorized as valid. Then, to see the level of effectiveness of the developed product, the developer conducted a product effectiveness test and got a score of 23.98. It denotes a significant difference in learning outcomes, and independent learning carried out by students before and after using interactive multimedia. After all the development processes were carried out, from design to evaluation, a conclusion can be drawn that interactive multimedia could be said to be feasible for use in learning, both in terms of validity and effectiveness.

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