



Developing Virtual Reality-Based Learning Media in Introduction to Psycholinguistics Class

Rifki Oktoviandry¹, M. Affandi Arianto², and Rita Arni³

^{1,2,3}English Department, Faculty of Languages and Arts, Universitas Negeri Padang, Prof Dr Hamka, Air Tawar Barat, Padang, West Sumatra, 25131

Correspondence Email: rifki.okto@fbs.unp.ac.id

Article History

Submitted: 2023-03-11

Accepted: 2023-05-08

Published: 2023-05-09

Keywords:

Learning Media, ADDIE, Virtual Reality, Introduction to Psycholinguistics,

Abstract

Learning media is one of the most important components in teaching and learning process. Without learning media, the teaching and learning process tends to be stiff and boring. The need for creative, interactive and innovative learning media is very substantial because the characteristics of today's students are different compared to previous generations. Generation Z, which is currently studying in tertiary institutions, is a generation that was born and grew up with digital technology. Conventional methods and media are no longer suitable for this generation. Therefore, teachers need to implement digital technology-based learning. This research aims to develop learning media based on Virtual Reality in the Introduction to Psycholinguistics course. The research method used is the Research and Development (R n D) research method with the ADDIE approach (Analysis, Designing, Development, Implementation and Evaluation). The results show that Virtual Reality-based learning media is valid and practical to be used in Introduction to Psycholinguistics Class. Despite of the validity and practicality, some minor revisions are still needed.

©2022 The Author(s) Publish by Jurusan Bahasa dan Sastra Inggris FBS UNP. This is an open access article under the CC-BY-NC license (<https://creativecommons.org/licenses/by-nc/4.0/>)

How to Cite: Oktoviandry, R., Arianto, M. A., Arni, R. (2023). Developing Virtual Reality-Based Learning Media in Introduction to Psycholinguistics Class. *Journal of English Language Teaching*, 12 (1): 361-371, DOI: [10.24036/jelt.v12i1.122393](https://doi.org/10.24036/jelt.v12i1.122393)

INTRODUCTION

Learning media is one of the most essential components in teaching and learning process. Without media, the teaching and learning process tends to be rigid and tedious. According to Karo-Karo & Rohani (2018), there are several benefits of using media in the learning process including uniformity in the delivery of learning material, time and effort efficiency, the clarity of learning process, interactiveness, the increase in learning motivation and qualified outcomes of students.

According to Hamid et al (2020), learning media is a channel in conveying information or messages to students in the learning process. Learning media has a vital role in the learning process that the information conveyed by the teacher can be digested and understood by students effortlessly. On the other hand, its absence will

likely have negative impacts on the learning process, both for teachers and students. Teachers may face some difficulties to explain teaching materials without any aids. Meanwhile, students will also have issues in understanding the explanations conveyed by the teacher. It is difficult to ponder and they are quickly feeling bored (Tafonao, 2018).

Learning media continues to evolve along with the development of technology because media and technology are effective tools for achieving learning goals. The use of media in learning began in the 1960s when the first children's textbook was written, entitled *Orbis Sensalium Pictus* (The Illustrated World) by a Czech educator named Johan Amos Comenius. This book is the forerunner to the use of visual learning media in the learning process (Januszewski & Molenda, 2008). Since then, visual media such as pictures have been used by teachers as a tool for teaching especially for explaining an abstract material.

As audio technology was discovered in the 20th century, visual technology began to be integrated with audio technology to produce AVA (Audio Visual Aids) learning media. Some examples of AVA learning media that are frequently used are videos, films, and sound presentation slides. Since then, the use of audio-visual media has begun to be massively used by teachers from various fields of study and various levels of education due to its effectiveness in increasing students' motivation and learning outcomes (Fatmawati, 2018; Ibe & Abamuiche, 2019; Pham, 2021).

The emergence of digital technology and the internet has provided more alternatives of learning media. Any digital platforms that are popular to students is oftentimes considered suitable for use as learning media. When websites began to appear on the internet, web-based learning media started to be used in the learning process such as blogspot and wordpress (Wicaksana, 2020). It also occurred when the emergence of social media trends on the internet such as Facebook, Twitter and Youtube. These three types of popular social media are also utilized as learning media in classrooms.

The development of digital technology is an opportunity to create new learning media. One example is Augmented Reality technology. This interactive technology is capable of projecting virtual objects into real objects at the same time. This technology has also begun to be benefitted as learning media in tertiary institutions (Mustaqim, 2017). The continuation of Augmented Reality technology is known as Virtual Reality technology that allows users to interact virtually with their environment.

In addition, the emergence of the COVID-19 pandemic has also raised the dependence of education sector on digital technology. To break the chain of transmission of COVID-19 during the pandemic era, the learning and teaching process in higher education is currently carried out online and in blended mode. Teachers or lecturers who previously used conventional methods in the classroom are starting to switch to digital one. However, the use of digital media in the learning process has received less attention, especially in universities. Some of the factors that influence it includes the lack of adequate infrastructure, lack of appropriate software for lectures topic, limited time of teachers in creating the media and lack of teacher's skills in designing media (Istiqlal, 2018)

The increasing development of technology and globalization coupled with the emergence of the prolonged COVID-19 pandemic has made learning currently carried out online and blended. The use of digital technology in learning has become a necessity for teachers and students. Everyone must be able to adapt to the current 'new normal' life. Currently, Moodle-based LMS is a platform that is widely used by universities in Indonesia as a learning medium. This Moodle-based LMS was discovered to be effective in increasing student motivation and learning outcomes during the COVID-19 pandemic (Rizal & Walidain, 2019; Rofiah, 2021).

The demand for creative, interactive and innovative learning media is crucial because the characteristics of today's students are different compared to previous generations. Generation Z, which is currently studying in tertiary institutions, is a generation that was born and grew up with digital technology. They are a generation that cannot be separated from gadgets and the internet. Conventional methods and media may be no longer suitable and obsolete for this generation. They have a strong connection to technology. Therefore, teachers are in dire need to implement digital technology-based learning.

Departing from this problem, the authors intends to design a creative, interactive, innovative and interesting Virtual Reality technology-based learning media by using the MilleaLab platform in the Introduction to Psycholinguistics course. By developing this media, it is expected that the students could have a new learning experience that will impact their learning motivation and outcomes. Virtual Reality is the latest technology that allows users to interact with a virtual environment.

Virtual Reality technology has not been widely used as a learning media because this technology is relatively new in Indonesia. Currently, this technology is only being used by limited number of schools in Indonesia as a result of a collaboration between schools and MilleaLab, a platform that can be used to create Virtual Reality content without having any expertise in programming skills (coding). By using the MilleaLab application, users can easily design their own virtual class because this application already has various features that are ready to use according to their needs. Given its user-friendly and advanced features, this technology must be utilized as best as possible to increase students' motivation and learning outcomes through a stimulating virtual learning experience.

The MilleaLab application does not require high computer specifications to run so that it can be used by many people. To use this application, the user must install the application on the computer desktop and also download the MilleaLab Viewer application on the mobile phone to view the results of the media design. This program must be run online because its various features are stored in cloud storage so it must be downloaded when used. However, to witness the results of media design, it can be carried out in an offline mode.

Research on the use of Virtual Reality technology in learning has also not been widely carried out in Indonesia. Most research on the application of Virtual Reality technology is at the elementary school level. Based on this research, Virtual Reality technology is effectively applied in the learning process (Dewi, 2020; Purwati et al., 2020; Supriadi & Hignasari, 2019). At Padang State University itself, research related to this technology has only been carried out at the Faculty of

Engineering (Yosfiah et al., 2022). This technology has never been applied in other courses, especially in language courses. Therefore, this research is expected to be able to become a pioneer of research related to Virtual Reality technology at Padang State University, especially in the field of English.

METHOD

This study aims to design virtual reality-based learning media in the Introduction to Psycholinguistics course. The research method used in this research was Research and Development (RnD). Research and Development research is a research method used to produce certain products, and to test the effectiveness of these products [19]. This research procedure adapted the ADDIE development model, consisting of five stages namely Analysis, Design, Development, Implementation and Evaluation. This learning media were validated by media experts. Apart from that, this learning media design were initially tested in the Introduction to Psycholinguistics class to get some input regarding the product development.

RESULTS AND DISCUSSION

1. Analysis (Analysis)

The analysis phase is the first stage in developing Virtual Reality-based learning media through the ADDIE approach. This stage was conducted to find out the problems experienced by students, the characteristics of students, the learning preferences of students, teaching materials and the specifications of the tools needed.

At this stage, the author conducted interviews with students to find out the needs of students for the development of instructional media in the Introduction to Psycholinguistics class. Based on the results of interviews, students stated that, in general, lectures in the Introduction to Psycholinguistics course were less interesting and tended to be strict. One of the any justifications of this is the majority of learning process was done online, so students cannot respond directly. The learning system implemented by the lecturer also seemed monotonous because at each meeting students were asked to make group presentations, discussions and then the lecturers just summarized the material that have been delivered by the group.

In addition, during online lectures, students also experienced technical problems in the form of unstable signals. The lecturers rarely used various learning media to satisfy students' different learning styles. Several types of learning media used by lecturers while teaching in the Introduction to Psycholinguistics classes include Power Point Slides, PDFs and Youtube videos. Based on the results of the interviews, students expected lecturers to apply engaging various methods and media in the teaching and learning process, especially in the Introduction to Psycholinguistics class due to many abstract concepts that need to be studied in depth.

After analyzing the students' needs, the author then conducted an analysis of the teaching materials. The Introduction to Psycholinguistics course is a course that studies the relationship between language and psychology. One of the main topics in this course is the relationship between language and the brain. This topic discusses the anatomy of the brain, the parts of the brain that play a role in language processing and the disturbances that occur if these parts are damaged. Among the many topics in the

Introduction to Psycholinguistics course, this particular topic requires visualization and allows it to be explained through virtual reality-based media.

Next, the authors analyze the specifications of the software required to develop Virtual Reality-based media. To design Virtual Reality-based media, researchers and the team used the MilleaLab application. The MilleaLab application is an application that allows users to create virtual reality-based media without having any expertise in programming skills (*coding*). This application is specifically designed for educators without having to use a high-spec computer/laptop with an affordable usage license fee. This application can be run on computers or laptops with medium specifications, which have 2GB of RAM, 2GB of storage, Windows 8-64-bit system, Intel Processor i3 5th gen or AMD Athlon II X4 650, Graphic 1GB VRAM and a minimum internet connection of 500kbps. In addition to applications on laptops, applications on Android are also needed to see the results of products designed by using the MilleaLab Viewer application which can be run on smartphones that have the following specifications:

- Processor: Hexa-core 4 x 1.4 Ghz or equivalent or above
- RAM: Minimum 3Gb
- OS: Android - minimum Lollipop
- Storage Space: 500 Mb preferably available
- Graphic Card: Adreno 510 or equivalent or above
- Sensors: Gyroscope sensor, Accelerometer sensor

The results of the Virtual Reality media that have been designed can be watched through three modes, namely by using Virtual Reality glasses, Video 360 and Gyroscope. VR designs that have been designed can also be watched online or offline.

2. Design

This stage is also known as the product design stage (blueprint). At this stage, researchers completed several things related to product design such as determining the media elements to be used such as images, sound, video and others. These supporting media elements can be made from scratch or can also be downloaded from the internet. In addition, at this stage, the researcher also made a template or a guide containing the player's position (*stand point player*) which was divided into three parts: *opening*, *core* and *closing*. This template consists of the concept of the course of each scene, environment, structure, moving and immovable objects needed and pop-up info containing text, sound and quiz.

3. Development

To design virtual reality-based learning media, the author used the Millealab Creator application version 1.3.6.4 which had previously been installed on a laptop or computer. The following is a display of the work page in the Millealab Creator application:

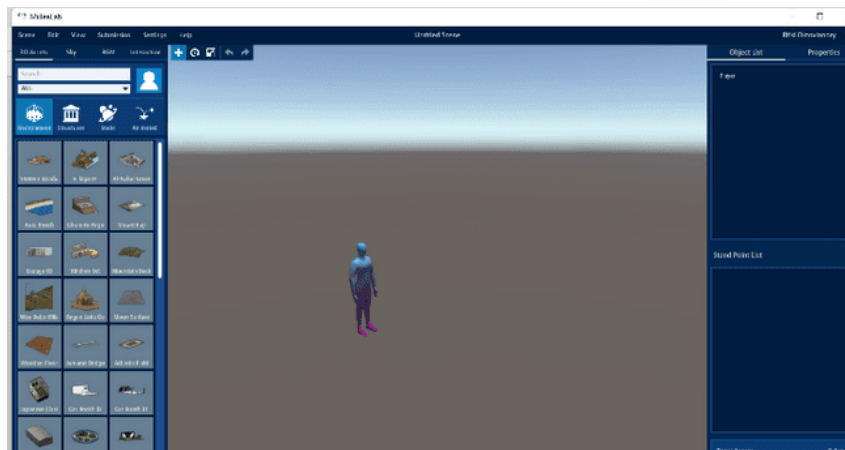


Figure 1. Display of the MilleaLab Creator work place

The virtual human figure in the picture above is called a *player*. Player is the position of a Virtual Reality user whose eye level is 170 cm high. The wide area around the player is called the *Canvas*; a place to create all creations to make teaching materials based on 3D and Virtual Reality. On the Millealab Creator work page, there are two panels: the left and the right panels. The right panel contains a Menu consisting of *Scene*, *Edit*, *View*, *Submission*, *Settings* and *Help*, *3D Assets*, *Sky*, *BGM* (Background Music) and *Interactions*. *Scene* is a menu that contains the *Scene Gallery*, *Save*, *Classroom*, and exits the application. The *Edit* menu contains scene editing methods which are *undo*, *redo*, *duplicate*, *delete*, *move*, *rotate* and *scale*. The *View* menu guides us to view the scene from above, below, front, rear and side. The *Submission* menu functions to upload 3D assets or *Skybox* made. The *Settings* menu is used to set the language and scene auto-save. Finally, the *Help* menu contains shortcut information, application version, frequently asked questions and Millealab Viewer link information.

Meanwhile, on the right panel are *Creator Account*, *Object List*, *Total Assets* and *Complexity*. The *Account* menu contains account details and the *Object list* encompasses a list of assets that have been designed and their level of complexity. *Total assets* are the number of assets that are traversed and *Complexity* relates to the level of complexity of the scene created in units of vertices. The higher the complexity of a scene, the slower the VR performance.

The first stage in making VR media is to design the environment. In this study, researchers and team designed an environment; that is a campus for the Faculty of Languages and Arts which consisted of classrooms, a mosque, school grounds, gates, laboratories and other buildings. The researcher also added an entrance gate bearing the words Faculty of Languages and Arts and added supporting objects, both static and dynamic. Some of the static objects in the VR class include cars, roads, and zebra crossing. While few examples of dynamic objects are highway police, and students. The following illustration shows the creation of an environment in a Virtual Reality-based class.



Figure 2. The design of environment in Millealab Creator application

After creating the environment, the researcher added *stand points* that serves to direct players when entering a VR-based class. These stand points are yellow directions that will guide the player from the start to the end of the scene. Apart from adding stand points, the researcher also added several other interaction features such as pop up info to provide certain information in virtual classes and video teaching materials which are the main source of learning in virtual reality classes. The following is a display of stand points and pop up info in virtual reality class.

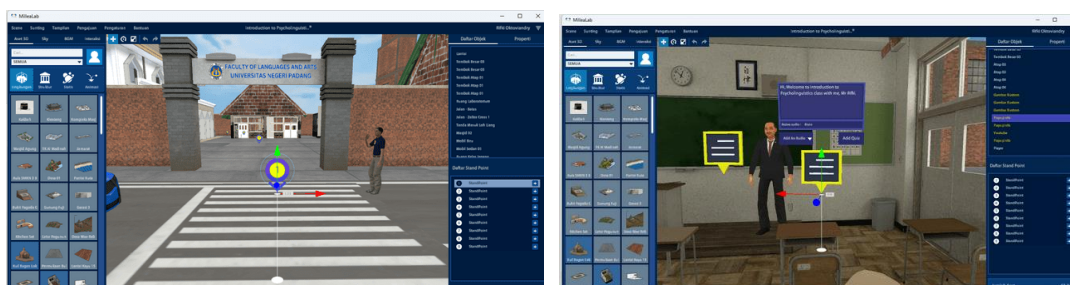


Figure 3. The Display of Stand Points and Pop Up Info

At the end, the researcher added a quiz feature which was used as an evaluation tool after the students take VR-based classes. There were two drawbacks to quizzes in a VR-based classroom. First, there were only multiple-choice mode quizzes so that they could only measure students' knowledge at a low cognitive level. The second drawback is the limited number of words in making answer choices. Thus, the researcher used True or False type of questions in this Introduction to Psycholinguistics class. The following figure depicts the quiz developed through the VR-based class.

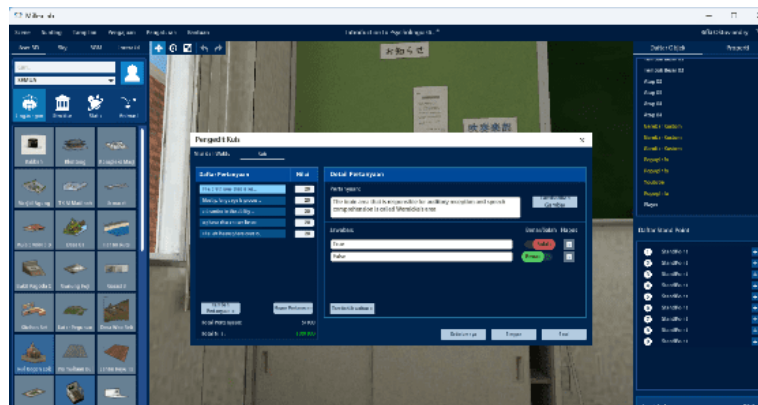


Figure 4. The Display of quizzes in MilleaLab App

After the scene has been created, the next step was to create a class. A new class was created by providing a class name. Hereafter, the capacity of the students attending the class and the period of time the class can be accessed by students was determined. The maximum number of students who took part in the class was approximately 50 people. Once it is decided, the scene that was made before was added. When the class was successfully created, the class code could be displayed by clicking show code button.

The next step was checking the class view to find out any errors in the scene that has been created. Class views could be seen via a smartphone by downloading the Millealab Viewer application through Google Playstore. VR-based classes can be watched through the Millealab Viewer application on a smartphone in three ways. The first way is by using VR glasses. This method is the best way to enjoy VR-based classes. By using these glasses, players can feel directly entering the virtual world. The second way is through a 360 camera. In this way, players can enjoy VR-based classes by watching videos that can be rotated 360 degrees. The last is to use the non-gyro method. The researcher tested the scenes that had been made to check for errors that might occur in the VR classroom. Finally, the researcher made revisions if there were any issues in the app. This process was accomplished periodically prior to be distributed to students.

4. Implementation

The implementation phase was the product trial stage that has been developed. At this stage, the researcher would like to find out the practicality and validity of the media being developed. At this stage, the researcher made a questionnaire which was then validated by media experts. Also, the researcher tested the media on a limited basis to five sophomore students of the English Department.

To improve the product, the researcher asked a media expert who is a Virtual Reality practitioner in the field of education in Indonesia to validate the media that had been created. Based on the validation results of media experts, the following results are obtained:

No	Assessment Aspect	Validity Percentage	Criteria
1	Display	87,5	Valid
2	Cohesiveness	75	Valid
3	Balance	87,5	Valid
4	Functionality	100	Valid
Average Percentage		87,5	Valid

Table 1. Media Expert Validation Results for VR-based Media

Based on the table above, it can be concluded that learning media based on Virtual Reality in the Introduction to Psycholinguistics course with the topic of Human Brain and Language Disorders are declared valid. However, media experts provide several suggestions for improving VR-based learning media. The first suggestion is to rearrange the position of the viewer (stand point) so that it looks more ideal. The next suggestion is to replace the pop-up info with a stand point so that the viewer is more directed at reading the information sequentially. Finally, media experts suggest that researchers add supporting objects such as books, plants, and other animations to make the media look more attractive.

A limited trial was carried out on five students to test the validity of the media. Researchers used VR glasses to get the maximum experience in Virtual Reality-based classes. Based on the results of limited trials on students, the following data were obtained:

No	Aspect	Average Percentage	Criteria
1	Content	66, 67	Practical
2	Technical	75	Practical
3	Learning experience	83	Practical
4	Motivation	81	Practical
5	Display	90	Practical
Average		79,3	Practical

Table 2. Results of students response after trying VR-based learning media

Table 2 above shows the percentages of students' responses regarding Virtual Reality-based learning media based on three criteria. Based on the table above, learning media based on Virtual Reality in the Introduction to Psycholinguistics course can be said to be practical.

All respondents affirmed that this VR-based learning media could be used easily. However, they mentioned some obstacles when using VR for the first time. Respondent 1 said that the duration of the video in the learning media should not be too long so that it does not cause neck pain. Respondent 2 added that there should have been clear information to direct the viewer in the VR class so that the viewer did not feel confused about the next direction. This was also conveyed by respondent 3 that the instruction box should have been numbered to make it easier for the viewer on which one to press first. Respondent 4 also testified that at first, he was also confused by the directions in the VR class. However, over time, he was able to adapt and complete the VR-based classes.

5. Evaluation

The last stage in the development of VR-based learning media is the evaluation stage. At this stage, researchers will make product improvements according to suggestions and input from respondents and media experts so that the learning media that have been made can be used optimally by students.

CONCLUSION

Virtual Reality-based learning media in the Introduction to Psycholinguistics course with the topic Human Brain and Language Disorders are valid and practical. However, there are several suggestions given by media experts and students regarding product improvement. One of the suggestions that stands out the most was the regularity and clarity of the stand points so that students could follow directions easily. VR-based media is an interesting medium and has not been widely applied in the learning process at universities in Indonesia so that this media can be an alternative for teachers to make learning in class more interesting and stimulating.

ACKNOWLEDGMENTS

The researchers would like to thank LPPM Universitas Negeri Padang for funding this research with the contract number 238/UN.35/LT/2022.

REFERENCES

- Dewi, R. K. (2020). Pemanfaatan Media 3 Dimensi Berbasis Virtual Reality untuk Meningkatkan Minat dan Hasil Belajar IPA Siswa Kelas V SD. *Jurnal Pendidikan*, 21(1), 28–37. <https://doi.org/10.33830/jp.v21i1.732.2020>
- Fatmawati, S. (2018). Penerapan Pembelajaran Model Cooperative Integrated Reading and Composition (CIRC) Berbantuan Website Blogspot Pada Mata Kuliah Metodologi Penelitian Pendidikan Fisika. *Edu Sains: Jurnal Pendidikan Sains & Matematika*, 6, 21. <https://doi.org/10.23971/eds.v6i2.937>
- Hamid, M., Ramadhani, R., Masrul, M., Juliana, J., Safitri, M., Munsarif, M., Jamaludin, J., & Simarmata, J. (2020). *Media Pembelajaran*. Yayasan Kita Menulis.
- Ibe, E., & Abamu, J. (2019). Effects of audiovisual technological aids on students' achievement and interest in secondary school biology in Nigeria. *Heliyon*, 5(6), e01812. <https://doi.org/10.1016/j.heliyon.2019.e01812>
- Istiqlal, A. (2018). Manfaat Media Pembelajaran dalam Proses Belajar dan Mengajar Mahasiswa di Perguruan Tinggi. *Jurnal Kepemimpinan dan Pengurusan Sekolah*, 3(2).
- Januszewski, A., & Molenda, M. (2008). *Educational Technology: A Definition with Commentary* (second). Routledge.
- Karo-Karo, I. R., & Rohani, R. (2018). Manfaat Media dalam Pembelajaran. *AXIOM : Jurnal Pendidikan Dan Matematika*, 7(1). <https://doi.org/10.30821/axiom.v7i1.1778>
- Mustaqim, I. (2017). Pengembangan Media Pembelajaran Berbasis Augmented Reality. *Jurnal Edukasi Elektro*, 1(1). <https://doi.org/10.21831/jee.v1i1.13267>

- Pham, D. T. T. (2021). The effects of Audiovisual Media on Students' Listening Skills. *International Journal of TESOL & Education*, 1(1), 13–21. <https://ijte.org/index.php/journal/article/view/3>
- Purwati, Y., Sagita, S., Utomo, F. S., & Baihaqi, W. M. (2020). Pengembangan Media Pembelajaran Tata Surya berbasis Virtual Reality untuk Siswa Kelas 6 Sekolah Dasar dengan Evaluasi Kepuasan Pengguna terhadap Elemen Multimedia. *Jurnal Teknologi Informasi Dan Ilmu Komputer*, 7(2), 259. <https://doi.org/10.25126/jtiik.2020701894>
- Rizal, S., & Walidain, B. (2019). Pembuatan Media Pembelajaran E-Learning Berbasis Moodle pada Matakuliah Pengantar Aplikasi Komputer Universitas Serambi Mekkah. *Jurnal ilmiah didaktika: Media Ilmiah Pendidikan Dan Pengajaran*, 19, 178. <https://doi.org/10.22373/jid.v19i2.5032>
- Rofiah, A. (2021). Efektivitas Pembelajaran Menggunakan Learning Management System (LMS) Berbasis Moodle Pada Program Studi Pendidikan Ekonomi di Universitas PGRI Wiranegara. *Prosiding Transformasi Pembelajaran Nasional (Pro-Trapenas) 2021*, 418–427.
- Supriadi, M., & Hignasari, L. V. (2019). Pengembangan Media Virtual Reality Pada Muatan Pelajaran IPA Kelas VI Sekolah Dasar. *JTP - Jurnal Teknologi Pendidikan*, 21(3), 241–255. <https://doi.org/10.21009/jtp.v21i3.13025>
- Tafonao, T. (2018). Peranan Media Pembelajaran Dalam Meningkatkan Minat Belajar Mahasiswa. *Jurnal Komunikasi Pendidikan*, 2(2), 103. <https://doi.org/10.32585/jkp.v2i2.113>
- Wicaksana, E. (2020). Efektifitas Pembelajaran Menggunakan Moodle Terhadap Motivasi dan Minat Bakat Peserta Didik di Tengah Pandemi Covid -19. *EduTeach: Jurnal Edukasi Dan Teknologi Pembelajaran*, 1(2), 117–124. <https://doi.org/10.37859/eduteach.v1i2.1937>
- Yosfiah, M. A. F., Primawati, P., Waskito, W., & Prasetya, F. (2022). Perancangan Media Pembelajaran Interaktif Virtual Reality pada Mata Kuliah Teknologi Pemesinan di Jurusan Teknik Mesin FT - UNP. *Jurnal Vokasi Mekanika (VoMek)*, 4(1), 132–136. <https://doi.org/10.24036/vomek.v4i1.303>