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# Evaluation User Acceptance of Mobile Virtual Reality Application for English Learning

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**Abstract**— This research develops virtual reality that integrates media elements such as sound, animation, and video with virtual world to create an immersive user experience. It is aimed to provide more interactivities and interesting features in supporting learning activities, such as using Cardboard to observe the virtual world and interact with virtual objects. Previously, a prototype was built to evaluate (high school) students' interests in using virtual reality technology as a supporting media to learn English language subject at high schools in Yogyakarta. Earlier research shows that students agreed to use of virtual reality prototype had been useful to support their learning activities. In this present research, a mobile application prototype is developed and evaluated using TAM methodology in order to understand the user behavior towards the application. The application of TAM in the field of learning and teaching for various learning domains implemented to understand the acceptance from the users while using Virtual Reality-based learning media. The TAM model It is a model can explain that the user's point of view will determine their attitude in accepting Virtual Reality-based learning applications. The evaluation results from this study showed that respondent is enjoyable to use this application (4.37 mean point) and 3.98 (mean point) feels that Virtual reality application is useful for learning English.

**Keywords**— Learning Evaluation, Virtual Reality, Mobile Application

## I. INTRODUCTION

Indonesia is One of the South East Asian countries that has adopted virtual reality (VR) technology into multiple sectors, such as tourism, gaming, and marketing. Virtual reality is often used to promote Indonesia's tourism by developing virtual tour for the people who cannot physically visit Indonesia due to multiple circumstances, such as travel restriction as impacted by COVID-19 pandemic.

Besides, in education there also another potential sector to adopt VR in supporting students in their learning process[1]. The use of VR may complement the conventional learning. Where teachers generally use textbooks, power points, educational websites, and movies to deliver learning materials. VR's interactive nature may serve as an innovation in providing students with more immersive experience in learning[2]. Moreover, it is also supportive of 3D applications that may be useful for

teachers to create more creative and interactive learning simulations[3]. It has been argued that the use of VR in school's learning process can stimulate interactions between students and teachers such as classroom exercises, lectures, and classroom discussions[4].

At earlier research, a prototype of Nintendo-based VR application has been developed and tested by high school students. The evaluation of this study showed that students who use virtual reality application prototype are interested in using them as an additional tool to support learning activities in English language subject. Based on the previous prototype, the current research built an Mobile-based VR application to assist students in learning English language subject. It is application was created on the grounds that it has a greater range of users, as compared to Nintendo's. Further, Technology Acceptance Model (TAM) is used to analyze the impact of e-learning implementation to the students' learning motivation. By using the TAM method, researchers also expect to find out the factors that may influence students to use VR application in learning English. Shabbir et al.[5] stated that TAM describes the user's acceptance of new technology that will be used widely onsite in the research field to find out how useful Virtual reality applications. According to Ngai et al [6] the built TAM shows that the desired technology depends very much on how users can receive virtual reality-based on technology. The implementation of TAM suggests the perceived benefits factor in using virtual reality applications.

This paper is aim to contribute to providing data about how the measurements result on this mobile virtual reality application that has been build and tested by the students using Technology Acceptance Model to understand if this application could be accepted by the students as a new alternative learning media. The results based on measurement indicator that is Personal innovativeness, Perceived enjoyment, Perceived ease of use, Perceived usability, and Intention to use return with good results that above the average.

## II. LITERATURE REVIEW

### A. Virtual Reality (VR)

Virtual reality (VR) is a technology that allows us to immerse in a virtual world that can be an imaginary realm,

or simply from objects from the real world[7]. Research and development of Virtual Reality technology is not only focused on mobile devices but across sectors that are being built in the smartphone environment. The concept of it refers to the overall simulated reality that is built with a computer system using digital formats to visualize surrounding objects so that they can increase the likelihood of interaction with users and there are no more specific limitations in the use of technology for various areas of life, Virtual Reality technology is widely used in scientific disciplines, including education, medicine, geography, advertising, etc.[8]. In the education sector to improve students' academic performance. VR's interactive nature is believed to have played a greater role than conventional learning media in improving students' apprehension to the given lessons [9]. Multiple researches have shown that VR-based learning environments drive interactive teaching performance and demonstrative instruction, which is in result increases students' focus on audiovisual clarity [10]. A research conducted by Yongzhong shows that VR can fill in the inadequacy of traditional learning and advance the efficiency of classical learning [11].

### B. Game Design and Storyboard

In current education, game is used as a mandatory media in teaching and learning activities. It has a positive impact on students in by improving their performance in the learning process[12][13][14]. Besides, students can also improve their cognitive skill and get more learning experiences by playing with various kinds of games offered in learning activities. Games can also be used as alternative learning media for students with special needs to help them focus during learning activities[15].

Currently, games are not only purported for children leisure and entertainment. It can also be utilized as a means of education as the use of games in teaching and learning activities are getting more encouraged these days[16]. It's been mentioned that games are often used as an alternative learning media for students with special needs[15]. As for conventional school students, some researches have shown that using games as an educational method may improve their overall academic performance[17]. In adopting games into education sectors, there seems to be a gap between students' and teachers' abilities in controlling the game. While most students have been accustomed to playing games, some teachers often find difficulties in doing so. Such gap may be bridged by creating a game storyboard which displays sketch of images drawn sequentially to follow the game's scripts. One of the best ways to view the game is to create a storyboard which is a sequence of images that represent the game level or scene and the different objectives of each game level. The storyboard is still a sketch and then includes a paragraph or two to describe what is happening in the sketch of the picture. Storyboard sketches are only used for brainstorming and arranging architecture in the general gameplay of virtual reality games and helpful for students and teachers in grasping the ideas of what they are expected to do in the educational games.

### C. Technology Acceptance Model (TAM)

There are many measuring instruments which can be used to measure human behavior towards computers application. One of them is TAM. TAM is an evaluation tool to measure human behavior when using new model of technology. TAM has been widely adopted to measure various subfields, namely to measure employees' level of comfort towards computer hardware in the office[18]. or users' acceptance towards reality technology[19]. It is a model that can analyze the factors that influence an application that has been made. In education, it is often used to measure student responses to e-learning systems in schools to see factors that can influence their enthusiasm for using the e-learning application.[20]. In particular, TAM is used to explain the determinants of technology acceptance, and to explain consumer behavior in various technologies and populations to find out how effective the applications being developed are for both stakeholders and users [21]. According to [22][23] the purpose of TAM is to provide an explanation of the determinants of computer acceptance in general and able to explain to users supported by several factors, namely Personal Innovation (PI), Perceived Enjoyment (PE), Perceived Ease of Use (PEOU), Perceived utility. (PU), and Intention to Use (ITU). These factors provide a useful basis for investigating the subsequent acceptance, use, and intentions of consumer behavior[24].

## III. RESEARCH METHOD

This research builds mobile-based Prototype VR, where the results of the trial will apply TAM to know the level of students' acceptance to the VR application. The flow of this research can be seen from figure 1. First, relevant data from the previous research were collected and being analyzed as a reference to create the new prototype of VR storyboard design. Such design was used as a reference to build virtual world and assets. Meanwhile, the collected data were applied to the mobile-based VR prototype. Upon the completion of the VR application, a test was performed by high school students to evaluate their interests in using the application. The test results were evaluated by using TAM method. At the final stage, the researchers made a report from the results of the analysis.

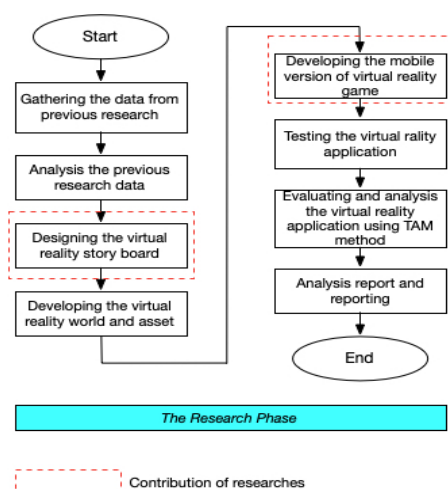
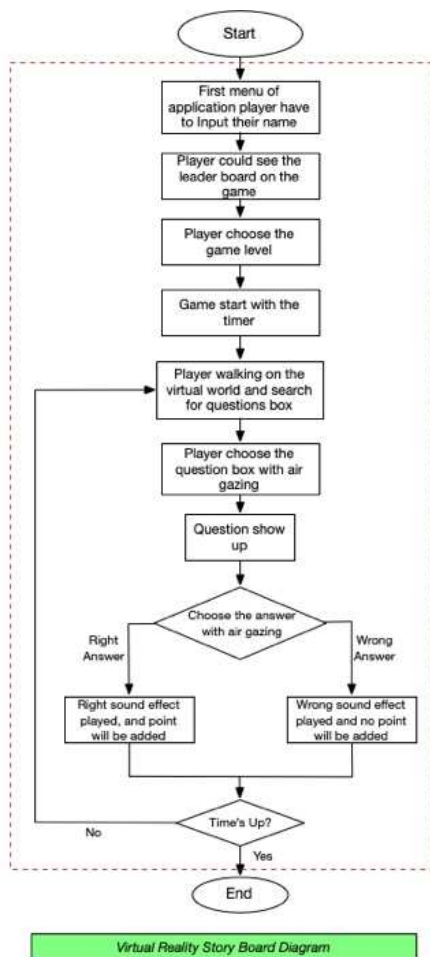


Fig.1. The Research Phase

## IV. RESULTS AND ANALYSIS

### A. Storyboard Game

An Mobile-based VR is expected to be widely used by students as there are many people using Mobile phones in Indonesia[25]. This VR application was created with the concept of game storyboard that requires its players to do their tasks in swift and correct manner. Additionally, storyboard also provides a visual layout of each scene. The flow of this research can be seen from Figure 2. At the initial stage, each player is required to type their name. The next step would be requiring the player to choose the level of game's difficulties before he/she may enter the game. The player then walks into the virtual world to look for the question boxes and answer the questions. Each correct answer will increase the total score, while incorrect answer will not reward players with points. When time is up, a dialog box questioning whether the players wish to continue will appear.



Contribution of researches  
Fig. 2. Virtual Reality Story Board Diagram

### B. Virtual Reality Mobile Application

Based on the storyboard and the already gathered data, a prototype of VR game storyboard design was created (Figure 3). The design was made according to the users' prerequisite upon the initial stage of data collection. The

game starts with users logging in or creating a new account (a)(b). The users can select four level of difficulties before playing the game (c). When the player starts playing, a timer will be shown at the top-left of the screen, indicating the duration of the games(d). Players will be roaming around the virtual world to look for existing questions (e). The correct answer will add the player's score (f). The game will be completed when the specified time is up, but players are given the option to continue or finish playing.

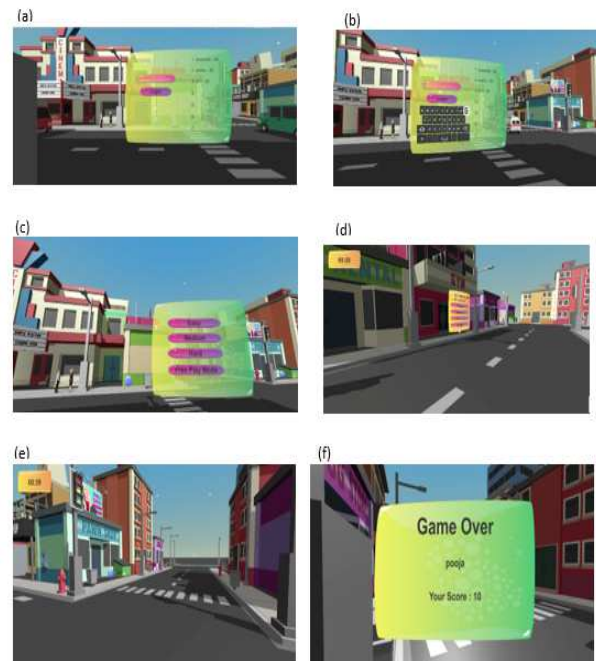


Figure 3. Virtual Reality mobile-based application

### C. Evaluation Results

Based on the trial activities carried out, 30 data were obtained for the TAM-based questionnaire. The TAM-based questionnaire consists of 11 questions to measure the perception and acceptance of a mobile-based virtual reality application prototype. This questionnaire consists of five categories: personal innovativeness (PI), perceived enjoyment (PE), perceived usefulness (PU), perceived ease of use (PEOU), and intention to use (ITU). Each question from the five categories was measured using a Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). This TAM-based questioning was adopted from several previous studies that have been validated in several studies [26].

#### a) Personal Innovativeness (PI)

Personal Innovativeness (PI) is used to measure interest in the new system used. In this case the system used is the VR storyboard. The indicator for measuring PI is by identifying the users' interests in using or experimenting with new technologies. In doing so, three questions of PI are put into the questionnaire. The results shown from table 2 showed a total average of 4.14 out of 5 points, which could be understood that students are interested in using the application. (1 = Strongly disagree to 5 = Strongly agree. N = 30)

TABLE I. RESULT OF PI

No	Statement	SA	A	N	D	SD	Mean	Std Dev
1	I'm interested in learning by using VR apps	40.00 %	43.30 %	10.00 %	6.70 %	0.00 %	4.17	0.874
2	I'm interested in learning English in class using the VR app	36.70 %	43.30 %	16.70 %	3.30 %	0.00 %	4.13	0.819
3	I want to use the VR app to learn English	30.00 %	53.30 %	16.70 %	0.00 %	0.00 %	4.13	0.681
Average Total							4.14	0.79

#### b) Perceived enjoyment (PE)

Perceived Enjoyment (PE) is an indicator to measure a user's comfort level in using the system. In this study, the questionnaire presented one question that can be categorized as PE. The results in table 3 shows an average value of 4.43 out of 5; with 50% students agreed that the VR application is appealing for them. It is also seen in table 3 that no one chose the strongly disagree option. (1 = Strongly disagree to 5 = Strongly agree. N = 30)

TABLE II. RESULT OF PE

No	Statement	SA	A	N	D	SD	Mean	Std Dev
1	This app with VR technology appeals to me.	46.70 %	50.00 %	3.30 %	0.00 %	0.00 %	4.43	0.568
Average Total							4.43	0.568

#### c) Perceived usefulness (PU)

Perceived Usefulness (PU) is a benchmark to know whether a user feels helped or motivated by using a system. In this case study there are 3 questions that can be categorized as PU. Table 4 shows that the average total is 3.89 out of 5, which means that more than half of the students are motivated to learn English using the VR application. (1 = Strongly disagree to 5 = Strongly agree. N = 30)

TABLE III. RESULT OF PU

No	Statement	SA	A	N	D	SD	Mean	Std Dev
1	This VR app motivated me to learn English	23.30 %	50.00 %	23.30 %	3.30 %	0.00 %	3.93	0.785
2	I feel the positive benefits of this VR app	13.30 %	56.70 %	30.00 %	0.00 %	0.00 %	3.83	0.648
3	In my opinion, this VR app is important for English learning	20.00 %	53.30 %	23.30 %	3.30 %	0.00 %	3.9	0.759
Average Total							3.89	0.73

#### d) Perceived ease of use (PEOU)

This factor becomes an indicator for researchers to assess the level of ease of user when using the system. There are two questions categorized under PEOU. The value shows the average total score of 4.37 out of 5, as shown in

table 5. The score may imply that most of the students think that the VR application is easy to use. (1 = Strongly disagree to 5 = Strongly agree. N = 30).

TABLE IV. PERCEIVED EASE OF USE (PEOU)

No	Statement	SA	A	N	D	SD	Mean	Std Dev
1	This VR app is easy to use	43.30 %	56.70 %	0.00 %	0.00 %	0.00 %	4.43	0.504
2	I have no difficulty using VR apps	33.30 %	63.30 %	3.30 %	0.00 %	0.00 %	4.3	0.535
Average Total							4.37	0.52

#### e) Intention to use (ITU)

The last indicator is Intention to Use (ITU), this indicator is used to determine the tendency of user behavior to use technology. There are two questions that fall into the ITU category. Table 6 shows that the average total is 4.19 out of 5 points. This signifies that more than 80% of students had the intention to use the VR applications to learn English and will highly likely use VR application, when provided, to help them learn English subjects. (1 = Strongly disagree to 5 = Strongly agree. N = 30).

TABLE V. RESULT OF ITU

No	Statement	SS	S	N	TS	STS	Mean	sdv
1	I'll Use This VR App in Learning	20.00 %	60.00 %	16.70 %	3.30 %	0.00 %	3.97	0.718
2	This VR app can help me learn English	43.30 %	53.30 %	3.30 %	0.00 %	0.00 %	4.4	0.563
Average Total							4.19	0.64

The above five factors are indicators used in the study to determine whether the user received from the built prototype. The summary of those five factors can be seen in Table 6. Most indicators scored more than 4.0 and only the PU indicator had a score below 4.0. However, more than half of the students still agreed that the VR application is useful for them.

TABLE VI. DESCRIPTIVE ANALYSIS OF CONSTRUCTS

Descriptive Analysis Of Constructs			
No	Constructs	Mean	Std. Dev
1	Personal innovativeness (PI)	4.14	0.79
2	Perceived enjoyment (PE)	4.43	0.568
3	Perceived ease of use (PEOU)	4.37	0.52
4	Perceived usefulness (PU)	3.89	0.73
5	Intention to use (ITU)	4.19	0.64

## V. CONTRIBUTION

The following contributions are broadly described in this study:

1. A mobile-based VR game is built to be more accessible for high school students in Indonesia.
2. The VR application built in this study is made by combine couple of technology application that has never been done before in virtual reality application, it's including using API to provide questions data to the application.
3. The development of VR application can grow the interest of high school students in learning activities. It can also be one of the new learning media for teachers.
4. The TAM method employed in this study can assess user behavior and satisfaction to the VR applications. In addition, the TAM method can also help researchers in analyzing the factors that may influence users in using the VR application.

## VI. CONCLUSION

This Mobile-based VR application development can be an alternative learning media for teachers and students. With the application of technology, it is expected that the teaching and learning atmosphere can be more interactive than conventional learning methods. From the trials and assessment conducted by 30 student participants, it shows that this prototype can be used and becomes a new alternative learning media for students in learning English. The final results of the analysis based on TAM Model, show that Personal innovativeness get 4.14 mean point, Perceived enjoyment get 4.43 mean point, Perceived ease of use get 4.37 mean point, Perceived usability get 3.89 mean point, Intention to use get 4.19 mean point. Where the highest value is PE which shows that students really enjoy the flow of the game in virtual reality games and 3.89% based on the result show that students feel the benefits of using this virtual reality application as new learning media to be used in learning process.

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## REFERENCES

- [1] D. P. Sari, S. Widodo, N. I. K. Dewi, and R. Hikmawan, "Virtual Reality: Strategies for Introducing Tourism in Indonesia," vol. 417, no. Icesre 2019, pp. 180–184, 2020, doi: 10.2991/assehr.k.200318.035.
- [2] D. Hamilton, J. McKechnie, E. Edgerton, and C. Wilson, *Immersive virtual reality as a pedagogical tool in education: a systematic literature review of quantitative learning outcomes and experimental design*, no. 0123456789. Springer Berlin Heidelberg, 2020.
- [3] "S IN SC," 2019.
- [4] X. Chang, D. Zhang, and X. Jin, "International journal of emerging technologies in learning," *Int. J. Emerg. Technol. Learn.*, vol. 11, no. 11, pp. 76–79, 2016.
- [5] S. Syed-Abdul *et al.*, "Virtual reality among the elderly: A usefulness and acceptance study from Taiwan," *BMC Geriatr.*, vol. 19, no. 1, pp. 1–10, 2019, doi: 10.1186/s12877-019-1218-8.
- [6] E. W. T. Ngai, J. K. L. Poon, and Y. H. C. Chan, "Empirical examination of the adoption of WebCT using TAM," *Comput. Educ.*, vol. 48, no. 2, pp. 250–267, 2007, doi: 10.1016/j.compedu.2004.11.007.
- [7] N. Elmqaddem, "Augmented Reality and Virtual Reality in Education . Myth or Reality?," pp. 234–242.
- [8] J. Martín-Gutiérrez, C. E. Mora, B. Añorbe-Díaz, and A. González-Marrero, "Virtual Technologies Trends in Education," *Eurasia J. Math. Sci. Technol. Educ.*, vol. 13, no. 2, pp. 469–486, 2017, doi: 10.12973/eurasia.2017.00626a.
- [9] A. Al-Azawei, W. R. Baiee, and M. A. Mohammed, "Learners' experience towards e-assessment tools: A comparative study on virtual reality and moodle quiz," *Int. J. Emerg. Technol. Learn.*, vol. 14, no. 5, pp. 34–50, 2019, doi: 10.3991/ijet.v14i05.9998.
- [10] W. Wiana, M. Syaom Barliana, and A. A. Riyanto, "The effectiveness of using interactive multimedia based on motion graphic in concept mastering enhancement and fashion designing skill in digital format," *Int. J. Emerg. Technol. Learn.*, vol. 13, no. 2, pp. 4–20, 2018, doi: 10.3991/ijet.v13i02.7830.
- [11] Y. Yang and L. Meng, "Physical Education Motion Correction System Based on Virtual Reality Technology," vol. 14, no. 13, pp. 105–116.
- [12] I. Varannai, P. Sasvari, and A. Urbanovics, "The Use of Gamification in Higher Education: An Empirical Study," *Int. J. Adv. Comput. Sci. Appl.*, vol. 8, no. 10, 2017, doi: 10.14569/ijacsa.2017.081001.
- [13] N. A. Zaini, S. F. M. Noor, and T. S. M. T. Wook, "The model of Game-Based Learning in fire safety for preschool children," *Int. J. Adv. Comput. Sci. Appl.*, vol. 10, no. 9, pp. 167–175, 2019, doi: 10.14569/ijacsa.2019.0100922.
- [14] S. Fleck and G. Simon, "An augmented reality environment for astronomy learning in elementary grades: An exploratory study," *IHM 2013 - Actes la 25ieme Conf. Francoph. sur l'Interaction Homme-Machine*, vol. 13, pp. 14–22, 2013, doi: 10.1145/2534903.2534907.
- [15] L. S. Riza, T. Sawiji, Haviluddin, Nurjanah, E. Budiman, and A. Rosales-Pérez, "A labyrinth game for blind children using problem solving learning model," *Int. J. Emerg. Technol. Learn.*, vol. 15, no. 2, pp. 58–71, 2020, doi: 10.3991/ijet.v15i02.11375.
- [16] Z. Turan, Z. Avinc, K. Kara, and Y. Goktas, "Gamification and education: Achievements, cognitive loads, and views of students," *Int. J. Emerg. Technol. Learn.*, vol. 11, no. 7, pp. 64–69, 2016, doi: 10.3991/ijet.v11i07.5455.
- [17] A. K. Owais, S. M. Al Abidi, Z. M. Hatamleh, and E. T. Hussein, "Technical and vocational education and training in the UAE," *Int. J. Emerg. Technol. Learn.*, vol. 15, no. 13, pp. 264–288, 2020, doi: 10.3991/ijet.v15i13.13801.
- [18] W. Wu and D. Shang, "Employee Usage Intention of Ubiquitous Learning Technology: An Integrative View of User Perception Regarding Interactivity, Software, and Hardware," *IEEE Access*, vol. 7, no. c, pp. 34170–34178, 2019, doi: 10.1109/ACCESS.2019.2893311.
- [19] J. Wu, "A space design teaching model using virtual simulation technology," *Int. J. Emerg. Technol. Learn.*, vol. 13, no. 6, pp. 163–175, 2018, doi: 10.3991/ijet.v13i06.8585.
- [20] S. A. Salloum, A. Qasim Mohammad Alhamad, M. Al-Emran, A. Abdel Monem, and K. Shaalan, "Exploring Students' Acceptance of E-Learning Through the Development of a Comprehensive Technology Acceptance Model," *IEEE Access*, vol. 7, pp. 128445–128462, 2019, doi: 10.1109/access.2019.2939467.
- [21] K. T. Manis and D. Choi, "The virtual reality hardware acceptance model (VR-HAM): Extending and individualizing the technology acceptance model (TAM) for virtual reality hardware," *J. Bus. Res.*, vol. 100, no. October, pp. 503–513, 2019, doi: 10.1016/j.jbusres.2018.10.021.
- [22] R. C. M. Yusoff, R. Ibrahim, H. B. Zaman, and A. Ahmad,

- “Evaluation of user acceptance of mixed reality technology,” *Australas. J. Educ. Technol.*, vol. 27, no. 8, pp. 1369–1387, 2011, doi: 10.14742/ajet.899.
- [23] F. D. Davis, “Perceived usefulness, perceived ease of use, and user acceptance of information technology,” *MIS Q. Manag. Inf. Syst.*, vol. 13, no. 3, pp. 319–339, 1989, doi: 10.2307/249008.
- [24] R. Nadlifatin, B. Ardiansyahmiraja, and S. F. Persada, “The measurement of university students’ intention to use blended learning system through technology acceptance model (tam) and theory of planned behavior (TPB) at developed and developing regions: Lessons learned from Taiwan and Indonesia,” *Int. J. Emerg. Technol. Learn.*, vol. 15, no. 9, pp. 219–230, 2020, doi: 10.3991/ijet.v15i09.11517.
- [25] A. R. Pratama, “Investigating Daily Mobile Device Use among University Students in Indonesia,” *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 325, no. 1, pp. 0–6, 2018, doi: 10.1088/1757-899X/325/1/012004.
- [26] V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, “User acceptance of information technology: Toward a unified view,” *MIS Q. Manag. Inf. Syst.*, vol. 27, no. 3, pp. 425–478, 2003, doi: 10.2307/30036540.

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