IJCETS 10 (2) (2022): 110-118

Indonesian Journal of Curriculum and Educational Technology Studies

http://journal.unnes.ac.id/sju/index.php/jktp

Teaching Digital Citizenship for Vocational Students through "Netizen" Application: its Urgency and Effectiveness

Diki Wahyudi,[1]✉ **Titi Prihatin**[2]

[1,2] Departmen of Curriculum and Educational Technology, Faculty of Education, Universitas Negeri Semarang, Semarang, Indonesia.

DOI: https://doi.org/10.15294/ijcets.v10i2.61101

Article History

Received : October 2021
Accepted : January 2022
Published : April 2022

Keywords

android; digital citizenship; mobile learning; independent learning

Abstrak

Studi ini bertujuan untuk mengembangkan aplikasi berbasis pembelajaran seluler, yang dinamakan Netizen, yang dapat mendukung pembelajaran mandiri siswa. Penelitian ini menggunakan pendekatan penelitian pengembangan, dengan menggunakan model desain instruksional ADDIE sebagai pendekatan utama. Hasil penelitian menunjukkan kecenderungan positif. Secara khusus, validasi dari ahli media dan ahli materi pada tingkat 84,67% dan 96,67%, masing-masing, menggambarkan kemungkinan untuk memproduksi aplikasi Netizen. Hasil uji Wilcoxon, dengan Asymp.Sig. (2-tailed) sebesar 0,000, kurang dari <0,05, menandakan perbedaan yang signifikan dalam skor rata-rata siswa sebelum dan setelah menggunakan aplikasi Netizen. Hasil uji efektivitas mengungkapkan skor kenaikan sebesar 0,7052 atau 70,52%, yang diklasifikasikan sebagai sangat efektif. Sebagai kesimpulan, aplikasi Netizen dapat meningkatkan proses pembelajaran dan hasil belajar siswa.

Abstract

This study aims to develop a mobile learning-based application, named Netizen, that supports students' independent learning. The research employs a developmental research approach, primarily utilizing the ADDIE instructional design model. The study's findings indicate a positive trend. Specifically, the validation of media and material experts at 84.67% and 96.67%, respectively, illustrates the feasibility of producing Netizen applications. The Wilcoxon test's results, with Asymp.Sig. (2-tailed) of 0.000, are less than <0.05, signifying a significant difference in the average scores of students before and after using the Netizen application. The effectiveness test results reveal a gain score of 0.7052 or 70.52%, classifying it as highly effective. In conclusion, the Netizen application can enhance students' learning processes and outcomes.

✉ Corresponding author :
Address: A3 building 1stFloor, Faculty of Education, Semarang State University, Semarang, 50229
E-mail: dikiwahyudi531@gmail.com

p-ISSN 2252-6447
e-ISSN 2527-4597

INTRODUCTION

Education in the 21st century currently requires students to be able to use Information and Communication Technology (ICT) creatively and critically so that learning can be more effective and efficient. Education in Law no. 20 of 2003 is defined as a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation, and country. One effort to develop skills in learning is the development of digital technology in the world of education. In 2022 Indonesia holds the presidency of the G20, an international cooperation forum consisting of 19 main countries and the European Union, has raised several issues to be discussed in the G20, one of which is education.

Through the G20 Education Working Group (EdWG) the Indonesian Ministry of Education and Culture raised several main issues rooted in the concept of Freedom to Learn, one of which is Digital Technology in Education (Digital Technologies in Education) (Ministry of Education and Culture, 2022). Seeing these conditions, the skill needed by a student at school or later in society is the ability to use ICT. Human resources who master science and technology and develop them will have conceptual abilities and technical abilities that can be contributed to improving the quality of educational processes and products (Rezky et al., 2019). The ability to utilize ICT is closely related to the learning resources used by students. One of the uses of ICT is to assist in independent learning which is one of the efforts in implementing the latest technology-based learning media which will greatly help and facilitate students in learning anytime and anywhere.

In carrying out the learning process there are tools that are needed, namely learning media. Fitriana et al. (2022) state that the learning media used in scientific lessons is very good at increasing students' motivation levels and digital literacy. The existence of learning media for students can improve learning outcomes so that an educational goal is certainly of high quality(Daryanto, 2013). Now there are various learning media that result from the rapid progress of science and technology. Daryanto (2010: 144) states that "the more widespread progress in the field of technology and the discovery of the dynamics of the learning process, the implementation of educational and teaching activities is increasingly demanding and obtaining a wide variety of educational media". One product that utilizes technology is a smartphone. Utilizers of technology-based learning media can help in terms of improving the facilities and infrastructure of teachers and students in the learning process (Aini, 2018).

Based on data findings from sources Newzoo in 2020, Indonesia is ranked fourth in terms of smartphone usage in the world with 170.4 million smartphone users. Smartphone user penetration in the country has reached 61 (*Daftar Negara Pengguna Smartphone,* 2021). The research from the Association of Indonesian Internet Service Providers (APJII) entitled "Indonesian Internet Profile 2022" reveals in more detail Indonesia's internet penetration has reached 77.02% in 2021-2022. The trend of internet penetration in Indonesia is increasing from year to year. In 2018, internet penetration in the country reached 64.8% and its level rose to 73.7% in 2019-2020 (APJII, 2021). With these data, it can be said that smartphones are an alternative media that can be used to support student learning at school.

Nowadays smartphones have become an important part of students. from being used for long-distance communication, Smartphones are also used to search for information (Indahini, Sulton, & Husna, 2018). The development of multimedia technology has also had a significant impact on the world of education which has affected the teaching and learning process, for example the use of smartphones as a means of learning in schools.(Tuilan, 2019). Rapid progress in the field of mobile technology has created a new zone known as mobile learning. Majid (2012) "the very high level of development of mobile devices, the relatively easy level of use, and the prices of devices that are increasingly affordable, compared to personal computer devices, are driving factors that further expand opportunities for the use or application of mobile learning as a new trend in learning".

Fadillah & Slamet (2019) mobile learning can be an alternative in solving problems in the world of education, including the problem of equal access to educational content, content quality, and others. Paratama (2018) explains that mobile learning is a learning model where in practice learning uses a smartphone or mobile phone as a medium for conveying information.

The existence of mobile learning can make it easier for students to access material anywhere and anytime to add insight not only in the classroom. This statement is reinforced by Majid (2012) who states, "mobile learning users can access educational content without being bound by space and time". In learning using mobile learning, students can access learning materials anywhere and anytime. So that student study schedules become more flexible, and they can learn with a learning style that suits them. Teachers can easily provide learning materials to students.

Independent learning is the process of student participation in solving problems in finding answers (Kirkman, 2007). In its application, students determine and manage their learning to lead to independent learning. It can be concluded that independent learning is a personal encouragement from an individual to hone competence and solve a problem in their learning efforts, whether through assistance or not.

An investigation revealed the effectiveness of learning using mobile learning for students, Almaiah & Jalil (2014) stated that the use of mobile learning can increase achievement and enable independent learning to occur. This research is reinforced by Rahmawati and Mukminan's research (2017) that mobile learning can increase student independence and learning outcomes. The application of mobile learning media has a great impact on students in increasing motivation, learning outcomes and increasing learning independence.

Digital Simulation and Communication or often abbreviated as Simdig is a compulsory subject in Vocational High Schools (SMK) which students study in class 10. Digital Simulation and Communication Subjects teach students to understand, apply, analyze, and evaluate about the field and scope Digital Simulation and Communication (Simdig) at various levels as well as developing students' skills and potential to improve student performance in accordance with the competency standards of the world of work. In the Simdig subject, Digital Citizenship is one of the materials that students must learn. Ribble and Bayley (2007) define digital citizenship as a norm of behavior in accordance with citizen guidelines used in the digital age as it is today.

Meanwhile, according to Mossberger, Tolbert, & McNeal (2008) "Digital citizens are those who use technology frequently, who use technology for political information to fulfill their civic duty, and who use technology at work for economic gain." From these two definitions, it can be concluded that Digital Citizenship is a norm or guideline for technology users in using technology for everyday purposes. Citizenship material is important to study considering the latest report on the Digital Civility Index (DCI) regarding the level of digital politeness of world internet users when communicating in cyberspace throughout 2020.

Indonesian netizens are at the bottom, aka the most impolite in Southeast Asia "From these two definitions, it can be concluded that Digital Citizenship is a norm or guideline for technology users in using technology for everyday purposes. Citizenship material is important to study considering the latest report on the Digital Civility Index (DCI) regarding the level of digital politeness of world internet users when communicating in cyberspace throughout 2020. Indonesian netizens are at the bottom, aka the most impolite in Southeast Asia "From these two definitions, it can be concluded that Digital Citizenship is a norm or guideline for technology users in using technology for everyday purposes. Citizenship material is important to study considering the latest report on the Digital Civility Index (DCI) regarding the level of digital politeness of world internet users when communicating in cyberspace throughout 2020. Indonesian netizens are at the bottom, aka the most impolite in Southeast Asia (*Riset: Netizen di Indonesia Paling Tak Sopan,* 2021).

The results of observations that researchers conducted at SMKN 11 Semarang, especially the Graphic Design major for class X in class X learning on June 14, 2022, revealed that student learning outcomes and understanding were still relatively low in digital citizenship material, simulation and digital communication subjects, this was due to the many practices that contained in Simulation and Digital Communication subjects, which made the limited subject hours shift quite a lot of theoretical material such as digital citizenship material. Even in some cases, teachers tend to skip the material by replacing it with a project, which sometimes has not been able to meet the achievement targets for Digital Citizenship material.

Moreover, the lack of learning media for simulation and digital communication subjects, especially digital citizenship materials, makes it difficult for students to find resources or materials for their study. The teacher revealed that the use of a technology-based learning media can-

not be applied because of the limited ability of the teacher to develop a learning media, especially those that support independent learning. Even though according to the teacher, he also understands the urgency of studying theoretical material, especially digital citizenship, by mastering the concepts and ethics of digital citizenship, students will be equipped with a guideline for a new digital culture where social rules and norms are sometimes unclear. By learning about digital citizenship students can develop a sense of ownership and personal responsibility for making good, ethical decisions in a networked world.

However, due to time constraints and also the teacher's lack of ability to develop a learning media that can help students learn material that cannot be explained thoroughly at school, theoretical materials such as Digital Citizenship must be presented briefly or replaced with a assignment. Thus, the researcher can conclude that the SMKN 11 Semarang school needs a learning media that supports independent learning in Simulation and Digital Communication subjects, especially in Digital Citizenship Material. However, due to time constraints and also the teacher's lack of ability to develop a learning media that can help students learn material that cannot be explained thoroughly at school, theoretical materials such as Digital Citizenship must be presented briefly or replaced with an assignment.

According to the previous discussion, this research focuses on developing learning media in the form of digital application that offers an alternative solution to support students' independent learning practices. Hopefully the application product will enhance and encourage the students' learning processes. In this regard, this research will contribute to the field of educational technology, especially in the sub-field of creating more meaningful, useful, contextual, and appropriate technological product. Compared to other product that try to facilitate the digital citizenship learning subject, the desired application based on digital technology in this research offers something new that has huge potential to attract the students' attention and engagement toward their learning processes.

METHOD

This research develops learning media in the form of a mobile learning-based application called "Netizen" for independent learning in Simulation and Digital Communication subject for Class X Digital Citizenship at SMKN 11 Semarang. The media design is first validated by media experts and material experts, simulations, and class trials to obtain the validity, practicality, and effectiveness of the media. This study uses research and development methods. The development of mobile learning-based Netizen applications developed by researchers has been carried out using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model developed by Dick and Carry (1996). Each research model has its own advantages.

The ADDIE model has the advantage that the research phase is carried out systematically and objectively to solve a problem, so that research activities run coherently, and the system is impartial in knowing the results of the research. In testing the Netizen application, researchers used the One-group Pretest-Posttest Design experiment pattern. This experimental pattern was carried out in three stages, namely, starting with the pretest, treatment, and then ending with the post-test. The sample in this study was part of the tenth-grade students majoring in Graphic Design at SMKN 11 Semarang with a total of 40 students as the experimental class.

The variables in this study include the independent variable, namely learning using the Netizen application based on mobile learning and the dependent variable, namely the learning outcomes of students in the subject matter of Digital Citizenship Simulation and Digital Communication. Data collection techniques using interviews, observation, questionnaires, tests, and documentation. While the data analysis technique used is the Wilcoxon Sign Rank Test and the N-Gain test using the SPSS application.

In detail, in the development process, researchers carried out 5 stages, namely the analysis stage, the design stage, the development stage, the implementation stage, and the evaluation stage. At the analysis stage, the researcher conducted observations, interviews, and documentation in the field to obtain information regarding the problems and potential that exist in SMA N 12 Semarang. Observation activities were carried out in January 2020.

RESULT AND DISCUSSION

This research developed a mobile learning-based application for grade 10 to teach the Digital Citizenship and Simulation subject for

the 2021/2022 academic school year. We have divided this section into two parts. Firstly, illustrating the development processes of the learning media. Secondly, discussing the results of the application implementation, specifically focuses on its effectiveness. A more detailed information can be found as follows.

A. Mobile Learning Based Netizen Application Development

In the development process researcher started by identified the learning needs and the most potential and possible learning media and design that could heavily support and facilitate the learning processes. Regarding to the ADDIE instructional design model researchers merge the initial parts of the developmental process of learning media production into three main parts or stages namely pre-production, production, and post-production. In pre-production it includes analysis and development, for the production part it includes design and in post-production it includes implementation and evaluation. The following is the development of mobile learning-based Netizen applications.

The initial stage of developing mobile learning-based Netizen applications for independent learning is needs analysis. Needs analysis was carried out at SMKN 11 Semarang which aims to find out the learning problems faced by students and teachers. Needs analysis is carried out by direct observation or observation methods during the teaching and learning process, and interviews with representatives of the curriculum sector. Then it was directed to the teachers of Simulation and Digital Communication subjects on the grounds that there were several learning problems faced by teachers and students in these subjects. The results of interviews with teachers showed indications of learning problems that were classified as moderate in Digital Simulation and Communication learning, especially regarding Digital Citizenship.

The design stage is based on the results of the needs analysis which includes the design of the concept or overall description of the contents of the media being created. In this design stage the researcher will compile competency maps and material maps, flowcharts, media content outline (GBIM), and media scripts.

The mobile learning-based Netizen application development phase aims to change the media design that has been designed into an application that contains text material, illustrated images, animations and audio in a format suitable for running on Android-based smartphones. The production stage for the initial preparation is by preparing the material to be used in the production of mobile learning-based Netizen applications. The next step in making Netizen applications based on mobile learning is to make supporting materials such as illustrative images made using Adobe Illustrator software and other sources such as Freepik and Fontawesome, after that the application production process is guided by the previously designed media design. then making the application is done using Microsoft PowerPoint software.

After the application is in accordance with the media script, the next step is to convert the ppt file to HTML5, the final step is to convert the HTML5 file to apk format with the help of Website 2 Apk Builder Pro. This aims to optimize the application so that it can be operated on devices with the Android operating system so that it can be implemented as a mobile learning application properly. After making the application is complete, media expert validation is carried out which aims to provide an assessment and find out the shortcomings of the mobile learning-based Netizen application. The media expert validators are Mr. Basuki Sulistio, S.Pd., M.Pd., Mr. Christian Arief Jaya, S.Pd., M.Pd. and Mrs. Ganis Putra W, M.Pd.. All these validators are lecturers at Semarang State University. After making revisions, the Netizen application visualization developed in this study is as follows.

1. Opening Screen Page

The initial appearance of the mobile learning application is the Opening screen, on this page there is a mobile learning application logo. The page background is blue with the aim that users focus more on the application logo and tagline as a strong introduction and message to users. This display lasts 3 seconds and then automatically goes to the next page.

2. Main Menu Page

The main menu is the main page of the Netizen application. On this page users can access all the features contained in the application. The dominant blue and white background with illustrations and explanatory text. Then there is an icon that gives an overview of the features or menu options in the Main Menu.

3. Sub Material Page

Sub-Material Page is a page that displays a

Figure 1 Sketch & Netizen Application Opening Page

Figure 3 Sub Material Page 1 on the Netizen Application

selection of sub-materials on the concept of digital citizenship. Blue and white background with illustrations and explanatory text. At the top of the greeting there is an introduction to the Material. There are two sub-material pages, namely the digital citizenship concept sub-material page and the digital citizenship ethics sub-material page.

4. Page Introduction to Material

The Introductory Material page is the initial display before starting to study the material, there is a description section that contains snippets of what will be learned in the sub-material. In addition, on the introductory material page there is a "Specification" which contains the number of slides and the estimated time needed to complete the sub-material. To start learning the material, you can select the "Start Learning"

Figure 2 Sketches & Netizen Application User Onboarding Pages

button.

5. Materials page

This page displays details or descriptions of certain materials that can be learned by users. The dominant white background with a combination of blue. The initial page of the material begins with the title of the sub-material at the top, there is also a completion indicator which functions as the user's learning progress. To mark how far the user has learned there is a "Marker" button and an X-shaped button, namely the "Close" button which functions to return to the Sub-Material Page. To continue studying, press the "Continue" button to continue reading the next material.

After the media is developed, further validation of the media that has been made. Validation results Netizen application based on mobile learning as follows.

B. Media Effectiveness Test Results

The results of the effectiveness of the media are obtained after Netizen application based on mobile learning applied to experimental class students. The effectiveness of mobile learning-based Netizen applications is assessed by testing differences in learning outcomes after using the application. The stage of testing the level of effectiveness of learning outcomes Digital Simulation and Communication of Digital Citizenship material is seen from the increased learning outcomes after using the mobile learning-based Netizen application than before using the Netizen application. The test is obtained from the results of the pre-test and post-test scores that

Figure 4 Sketch & Introduction Page for Netizen Application Material

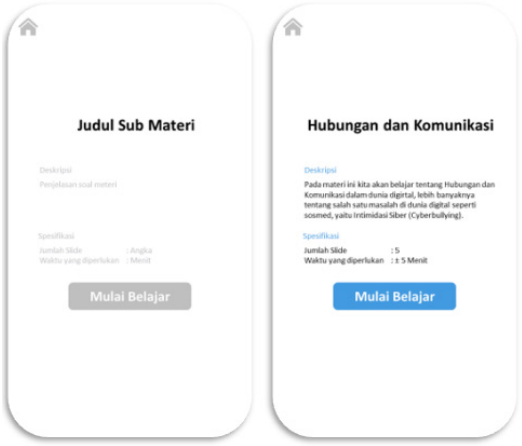

Figure 5 Sketches & Netizen Application Material Pages

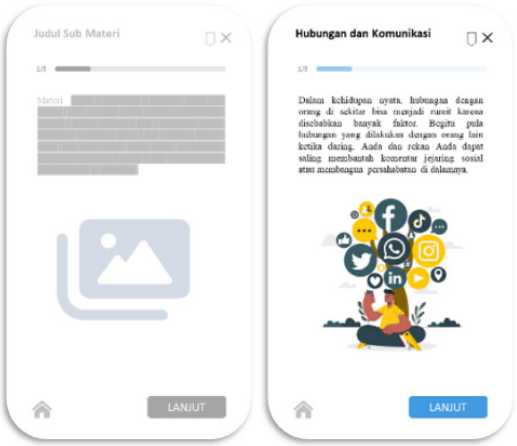

Table 1 Results of Validation by Media Experts

Validators	Score	Assessment Conclusion	Suggestion
Basuki Sulistio, S.Pd., M.Pd.	96%	Media is eligible to be produced with revisions	UI/UX display needs to be improved again
Christian Arief Jaya, S.Pd., M.Pd.	73%	Media is eligible to be produced with revisions	Adding illustrations or backgrounds on each slide
Ghanis Putra Widhanarto, S.Pd., M Pd	85%	Media is eligible to be produced with revisions	Added offline evaluation test and material summary

Table 2 Results of Validation by Material Experts

Validators	Score	Assessment Conclusion	Suggestion
Alvian Vilen Pandega, S.Pd	96.67 %	Media deserves to be production with revisions	Improved application display layout
Taufiqul Khayr, S.Pd	96.67 %	Media deserves to be production with revisions	Added offline evaluation test

Table 3 Pre-test average results

Kelsa X DG	Average Suggestion
Pre-test	9.25/14

Table 4 Pos-test average results

Kelsa X DG	Average Suggestion
Post-test	12.6/14

have been done by students. The results of the pre-test and post-test in the class can be seen in the following table.

Media effectiveness test was carried out using the Wilcoxon sign test and the N-Gain test. The Wilcoxon sign test is to find out the significance of the differences in the final ability results of the two classes, while the N-Gain test is to find out the effectiveness Netizen application based on mobile learning. For the hypothesis on the Wilcoxon sign test this study as follows: Ho: $\mu 1 \leq \mu 2$, with Ho: There is no difference between the results of learning mathematics for the Pre Test and Post Test. Ha : $\mu 1 > \mu 2$, with Ha : There is a difference between the mathematics learning outcomes for the Pre-test and Post-test. Based on the results of the Wilcoxon sign test known Asymp. Sig. (2-tailed) of 0.000. Because the value of 0.000 is smaller than 0.05, it can be concluded that "Ho is rejected". This means that there is a difference between the results of learning mathematics for the Pre-Test and Post Test, so the conclusion is "there is a difference between the average pre-test score and the average post-test score".

After obtaining the results of the Wilco-

xon Test, the researcher then tested the effectiveness of the media using N-Gain to determine the increase in the results of students and related to the media effectiveness test. Based on the calculation results above, it can be seen that the gain value is 0.7052 or 70.52%. Because the gain score is in the range g > 0.7 or expressed in percent g > 70%, it is included in the High category.

The hypothesis used in the N-Gain test for the effectiveness of this research media is as follows: Ho: effectiveness ≤ 1, with Ho: There is no increase in learning outcomes after implementing the "Netizen" application for self-learning Digital Citizenship and Digital Communication materials based on mobile learning class X SMKN 11 Semarang. Ha: effectiveness > 1, with Ha: There is an increase in learning outcomes after implementing the "Netizen" application for self-learning Simulation and Digital Communication of mobile learning-based Digital Citizenship material for class X SMKN 11 Semarang. Meanwhile, the decision-making criterion, namely Ho, is rejected if it is effective, > 1, Ho is accepted if effectiveness ≤ 1.

Based on the results of the N-Gain test for the effectiveness of the media in this study, it is known that the gain value is 0.7052 or 70.52%. Because the gain score is in the range g > 0.7 or expressed in percent g > 70%Then Ho is rejected, accept Ha. It can be concluded that there is an increase in student learning outcomes after using the Netizen application of self-learning Digital Simulation and Communication material for class X Citizenship based on mobile learning at SMKN 11 Semarang.

CONCLUSION

In the current era of science and technology development, the use of digital technology is an alternative in solving problems in the world of education. The results of the problem analysis at SMKN 11 Semarang found several obstacles experienced by students and teachers in learning Simulation and Digital Communication, especially in Digital Citizenship material. Students' understanding of digital citizenship material is quite low due to the ineffective learning process of the material. Therefore, we need a learning media in the form of mobile learning that can support independent learning to overcome this problem. Planning for the design of the mobile learning application starts with making competency maps and material maps which are then made into a flowchart and media script based on the GBIM design that has been made.

Netizen application feasibility test results from assessments by media experts, Netizen applications get an average percentage score of 84.67% while Netizen application material experts get an average percentage score of 88.6%. The results of the feasibility test by students in learning is 96.67%. Thus, it can be concluded that the Netizen application is declared feasible to be implemented in Digital Citizenship Learning Simulation and Digital Communication as an effort to improve student learning outcomes and improve the independent learning process. Based on the results of the Wilcoxon test, the effectiveness of the mobile learning-based Netizen application obtained an Asymptotic significance of 2-tailed with a value of 0.000. smaller than <0.05, which means there is a difference between the mathematics learning outcomes for the pretest and post-test. Then based on the results of the n-gain calculation, a gain score of 0.7052 or 70.52% is obtained which is included in the high category. Therefore, it can be concluded that mobile learning-based Netizen applications are effective in using Digital Citizenship Simulation and Communication materials to improve student learning outcomes.

REFERENCES

Aini, N., et al. (2018). Pengembangan Mobile Learning Berbasis Android PadaMata Pelajaran Jaringan Dasar. *Jurnal Pendidikan Informatika.* 2(1), 34-41.

Almaiah, M. A., & Jalil, M. A. (2014). Investigating students' perceptions on mobile learning services. *International Journal of Interactive Mobile Technologies, 8*(4), 31–36. https://doi.org/10.3991/ijim.v8i4.3965.

APJII. (2021). *Tren penetrasi internet di Indonesia meningkat dari tahun ke tahun.* Apjii, 51.www.apjii.or.id.

Daftar Negara Pengguna Smartphone Terbanyak Indonesia Urutan Ke Berapa? (2021, July 1). Katadata. https://databoks.katadata.co.id/datapublish/2021/07/01/daftar-negara-pengguna-smartphone-terbanyak-indonesia-urutan-berapa

Daryanto. (2010). *Media Pembelajaran Peranannya Sangat Penting dalamMencapai Tujuan Pembelajaran.* Yogyakarta: Gava Media.

Daryanto. (2013). *Media Pembelajaran*. Yogyakarta: Gava Media.

Dick, W., & Carey, L. (1996). *The systematic design of instruction* (4th Ed.). New York: Harper Collins.

Fadillah, R., & Slamet, L. (2019). Perancangan Aplikasi Mobile Learning Berbasis Android di SMK Negeri 6 Padang. *Jurnal Vokasional Teknik Ele-*

ktronika dan Informatika, 7(2), 61-70.

Fitriana, L.A., Wijayati, N., & Utanto, Y. (2022). The Effectiveness of Android-Based Learning Media on Science Lesson Content to Increase Motivation and Digital Literacy of Grade V Elementary School Students. *Journal of Primary Education, 11*(1), 105–121.

Indahini, R.S., Sulton, & Husna, A. (2018). Pengembangan multimedia mobile learning pada mata pelajaran Simulasi dan Komunikasi Digital Kelas X SMK. *JKTP, 1*(2), 141-148.

Kirkman, S., Coughlin, K., & Kromrey, J. 2007. Correlates of satisfaction and success in self-directed learning: relationships with school experience, course format, and internet use. *International Journal of Self-Directed Learning*. 4(1). 39-52.

Majid, A. (2012). *Mobile learning*. Diunduh pada laman http://jurnal.upi.edu/file/Mobile_Learning_ok.pdf tanggal 11 November 2019.

Ministry of Education and Culture. (2022). *Menilik Manfaat Kepemimpinan Kemendikbudristek pada G20 untuk Indonesia*. Diakses pada laman https://www.kemdikbud.go.id/main/blog/2022/03/menilik-manfaat-kepemimpinan-kemendikbudristek-pada-g20-untuk-indonesia

Mossberger, K., Tolbert, C.J., & McNeal, R.S. (2008). *Digital Citizenship: the internet, society, and participation*. London, England: The MIT Press Cambridge, Massachusetts.

Pratama, R. A., Ulfa, S., & Kuswandi, D. (2018). Mobile Learning Berbasis Game Based Learning Pelajaran Matematika Pokok Bahasan Bangun Ruang Sisi Datar. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan.*, 3(6), 771–777.

Rahmawati, E.M. & Mukminan. (2017). Pengembangang M-Learning Untuk Mendukung Kemandirian dan Hasil Belajar Mata Pelajaran Geografi. *Jurnal Inovasi Teknologi Pendidikan*, *4*(2), 157–166.

Republik Indonesia. (2003). *Undang-undang Nomor 20 Tahun 2003 tentang Tujuan Pendidikan*. Jakarta.

Rezky, M.P., Sutarto, J., Prihatin, T., Yulianto, A., & Haidar, I. (2019). Generasi Milenial yang Siap Menghadapi Era Revolusi Digital (Society 5.0 dan Revolusi Industri 4.0) di Bidang Pendidikan Melalui Pengembangan Sumber Daya Manusia. *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS). 2*(1), 1117-1125.

Ribble, M. & Bailey, G. (2007). Digital Citizenship in School. Washington DC: International Society for Technology in Education.

Riset: Netizen di Indonesia Paling Tak Sopan se-Asia Tenggara. (2021, Feb 25). CNN Indonesia. https://www.cnnindonesia.com/teknologi/20210225115954-185-610735/riset-netizen-di-indonesia-paling-tak-sopan-se-asia-tenggara

Tuilan, V.B.C., et al. (2018). Pengembangan Aplikasi Mobile Learning Interaktif Berbasis Android Teknik Multimedia 2D di SMK. *Jurnal Sains danTeknologi*, *2*(1), 95-108.