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DEVELOPMENT OF MOBILE LEARNING BASED ON A SCIENTIFIC APPROACH TO LEARNING ELEMENTARY SCHOOL THEMES

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This study aims to develop a scientific-based mobile learning application for thematic learning that is suitable for use in elementary school learning. The research method used is Research and Development with the development model using ADDIE which has five stages, namely analysis, design, development, implementation, and evaluation. The instrument used in the study used an assessment sheet from material experts, media experts, teacher assessments, and student trials. This research was tested on 42 elementary school students. The results showed that from the validation of the material experts a percentage of 90.25% was obtained, then the results of the validation by media experts with a percentage of 91.00%, and the results of the assessment by the teacher obtained a percentage of 87.50% in the appropriate category. The test was carried out on students, the percentage of learning media quality was 91.50% with a very decent category. Based on the results of data acquisition, it shows that the scientific-based mobile learning application in thematic learning is feasible to be used as a learning medium for fourth grade elementary school students.

Keywords: ***Mobile Learning, Scientific, Thematic, ADDIE Model.***

1. Introduction

The thematic learning process for the 2013 elementary school curriculum is designed using a scientific approach which is a learning approach that makes students the center of learning (Fauziah et al, 2013, p.166). Permendikbud No. 22 of 2016 concerning Process Standards has indicated that in the learning process, students must be guided by scientific steps or what is known as a scientific approach. Learning with a scientific approach is a learning process designed so that students are actively able to construct concepts, laws, or principles through the stages of observing, formulating problems, proposing or formulating hypotheses, collecting data with various techniques, analyzing data, drawing conclusions and communicating. concepts, laws or principles that are "discovered" (Lazim, 2013, p.1).

The scientific (scientific) approach is believed to be a strategic step to grow students' attitudes, knowledge, and skills. Fadhillah (2017, p.175) suggests, the scientific approach is an approach used in learning that is carried out through a scientific process. What is learned and obtained by students is done with their own senses and minds so that they experience it directly in the process of gaining knowledge. In addition, the learning process that uses a scientific approach is intended to provide understanding to students in recognizing, understanding various materials, that information can come from anywhere, anytime, not depending on information directed by the teacher (Siregar 2019).

The implementation of the scientific approach in learning has been carried out in schools, especially since the implementation of the 2013 curriculum, but this scientific approach is difficult to apply. Based on

the results of observations of fourth grade students at SDN 05 Sungai Paduan which was carried out for 2 learning meetings on 19 July 2021 and 26 July 2021, it was concluded that the application of thematic learning was not optimal in using a scientific approach. The teacher pays less attention to the scientific steps of observing, asking, gathering information, reasoning and communicating. Teachers are still trapped in learning that positions the teacher as the only source of learning. This is because, according to Machin (2014) the teacher's lack of knowledge in teaching students using a scientific approach. On the other hand, according to Suharyadi in (Mardiana, 2018, p.87) the lack of learning resources that support the scientific approach in the learning process and the circulating teaching materials emphasizes memorization of participants. In addition, the current learning media is more as a means of explaining the material without paying attention to the student's process of acquiring this knowledge. Therefore, scientific implementation requires learning media that directs students to go through scientific stages, namely observing, asking, gathering information, reasoning, and communicating. One of the media that can be used by utilizing scientific-based mobile learning is because it can design features containing learning steps that can direct students to go through scientific stages.

There are several researchers who develop mobile learning in thematic learning, including Wijayanti (2019) conducting research on mobile learning that can be applied in elementary schools. Sari (2021) developed an android-based learning media or mobile learning in the fourth grade thematic learning in elementary schools. The results of the two researchers' research show that mobile learning can help students learn thematics in elementary schools. However, the two researchers still have weaknesses, namely the media developed is still about delivering material without paying attention to the scientific process.

Attewell in (Rachma et al, 2020, p.477) states that mobile learning has many benefits for students, namely: increasing involvement in learning, motivation, and enthusiasm for students to learn, improving the desire to learn independently, a sense of belonging to learning and self-motivation. , improve time discipline both attendance and in learning, increase the participation of students with learning difficulties and limitations in learning. Clark Quinn in (Pritama et al, 2018) states that the combination of mobile and e-learning will expand access to resources, strong disbursement capabilities, enrich interactions and support access that will not be limited by space and time.

The use of mobile learning in learning is basically nothing new in the world of education. It just hasn't been used to its full potential. Especially with the presence of the corona virus pandemic (covid-19), the use of mobile learning in learning is very much needed to support the distance learning process as well as in limited classes.

Referring to the problems described above, the researchers are interested in conducting research on the development of scientific-based mobile learning in elementary school thematic learning which will be applied in learning Theme 2 Energy Sources Class IV SDN 05 Sungai Paduan.

2. Methods

The implementation of this research uses the Research and Development (R&D) method with the ADDIE model. This research produces certain products and then tested whether the resulting product is effective or not in its use. The use of ADDIE as a research model is because this research model is simple and easy to learn. The implementation structure is structured systematically and in accordance with the needs of research and development. The subjects in this study were fourth grade students at SDN 05 Sungai Paduan. The instruments used in this study were a media validation expert questionnaire, a material validation expert questionnaire, a teacher eligibility assessment questionnaire and a student trial questionnaire. Data collection methods in this study were observation, interviews with teachers, and distribution of product validation questionnaire sheets. The implementation of data analysis used

descriptive analysis with a Likert scale based on the specified category, while the results of observations and interviews were analyzed qualitatively.

The results developed in this study are scientific-based mobile learning applications on thematic learning that will be used as learning media for fourth grade elementary school students. The stages in the ADDIE research model adopting Sugiyono (2018) are as follows:

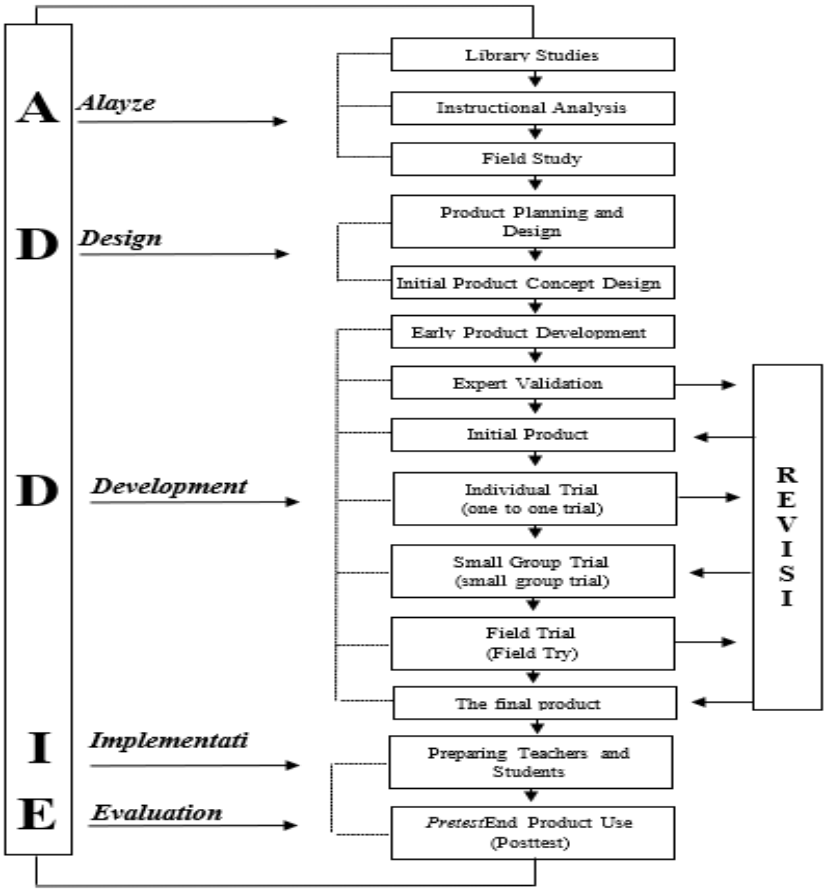

Chart 1. Research Development Procedure

a. Analysis Stage (Alayze)

In this analysis stage, the researcher collects the data needed before developing scientific-based mobile learning in elementary school thematic learning. It is important to know the main problems faced by teachers and students in applying the scientific approach in thematic learning. This stage of analysis is carried out by literature study with literature review and relevant research. Then the instructional analysis by identifying the competencies that must be mastered by students contained in the curriculum. Furthermore, field studies by analyzing the characteristics of students. The three stages of the analysis must contain the validation of the gap between real and ideal abilities and be able to answer the content of the curriculum, knowing the technology that can be used and knowing the facilities owned by students and

schools. In addition, at this stage, researchers analyzed the need for the development of new learning media and analyzed the feasibility and requirements for developing new learning media (Sugiyono, 2015, p.200).

b. Design Stage

According to Branch (2009, p.60) general procedures carried out at the design stage are conducting or making things needed, compiling evaluations, formative designs, and producing test strategies. At this stage there are stages of planning and product design. In preparing a plan for making media, it begins with developing a scientific-based mobile learning framework. References in the preparation of scientific-based mobile learning are product specifications that have been made and formulate learning objectives. The initial product concept design of scientific-based mobile learning begins with the initial concept of storyboards, product interfaces, and is designed to become a visual prototype or conceptual product. This initial product concept design is ready to enter the initial product development stage which will be validated by experts.

c. Development Phase (Development)

This stage is divided into several activities with the aim of realizing or presenting the final product in the form of scientific-based mobile learning. The development stage starts from the manufacture of the initial product, expert validation (expert review) and revision, as well as three stages of testing (conduct a pilot test) accompanied by revisions to produce the final product. Some of the details of the steps carried out include:

d. Implementation Phase (Implementation)

At this stage, trials have been conducted on classroom teachers and 37 students at SDN 05 Sungai Paduan. At this stage, the final product that has gone through expert validation, individual trials, small group trials, and large group trials can be implemented. In implementation, preparing teachers and students is the main thing in using scientific-based mobile learning products.

e. Evaluation

Evaluation is a process to see whether the product that has been developed is successful or not. At this stage, each stage of ADDIE development always has a simultaneous evaluation stage. This evaluation elevates the quality of development to the next stage. Thus, the evaluation in this study focuses more on whether product development can have good effectiveness for teachers and students in learning. To find out the effectiveness of scientific-based mobile learning, students receive an initial attitude questionnaire (cognitive) and pretest questions before using scientific-based mobile learning, treatment of the use of scientific-based mobile learning end products, and then a final attitude questionnaire (affective-conative) and posttest questions after use. scientific-based mobile learning (both before and after implementation).

3. Results and Discussion

The implementation of research activities is carried out using the ADDIE development model (Sanjaya et al, 2015) through the following stages:

Stage of Analysis (Analysis). The activities carried out by the researchers began with conducting observations and interviews in class IV at SDN 05 Sungai Paduan. The implementation of this observation activity includes student analysis, teacher analysis and material analysis.Based on the results of an interview with the Head of SDN 05 Sungai Paduan on June 12, 2021, for 10 months the online and offline teaching and learning process. Students who study online/online (on the network) with personal gadgets are 83% (182 students) and those who are offline/offline (outside the network) are 17% (36 students) of the total 218 students. SDN 05 Sungai Paduan has an internet network (4G) to support the learning process using mobile learning or simply exchanging files, so teachers should be able to optimize the use of mobile learning

in thematic learning. Therefore, scientific-based mobile learning in thematic learning is very possible to be applied to students in thematic learning.

From the results of interviews with classroom teachers, it was found that the problem was that the application of scientific approaches was not optimal because the currently circulating media emphasized mastery of the material without paying attention to the learning process. Therefore, teachers need learning media that have supporting features that are able to direct students through the scientific stage. From the results of the analysis above, this study seeks to develop a scientific-based Mobile Learning application for thematic learning. Through this application, it is expected to maximize learning activities and make it easier for teachers to deliver learning materials in a more practical and innovative way.

Stage Design (Design). Design activities as a product planning stage which include making flowcharts, compiling materials, preparing questions, videos, pictures or illustrations that are inserted into learning media through PowerPoint which will be used as apk using Website 2 APK Builder Pro v4.0. The process of collecting animations and illustrations of learning media begins with the selection of a color palette that is adapted to the theme of the elementary school. The selection of bright citizens is a characteristic so that it looks attractive to students. The illustrations were designed by the researcher himself using the Canva application so that the design was tailored to the display needs of the mobile learning application.

Development Phase (Development). After the design stage is done, the next step is to develop the application. The product developed in this research is an apk (android package) that can be installed on smartphone. This apk is combined with a scientific approach so that in it there are features of observing, asking questions, gathering information, reasoning and communicating. Mobile learning application development uses several applications, namely: PowerPoint, iSpring Suite 9, Website 2 APK Builder Pro v4.0, Java 8 and Camtasia. The menu section developed in this mobile learning application is the main menu page, learning objectives menu, scientific learning menu, material deepening menu, the last is the question menu which was developed using iSpring Suite 9 which when students finish working on the questions will be sent to the teacher's email. The following is a display of the mobile learning application that has been developed:

Figure 1: Main Menu Display of Mobile Learning Application

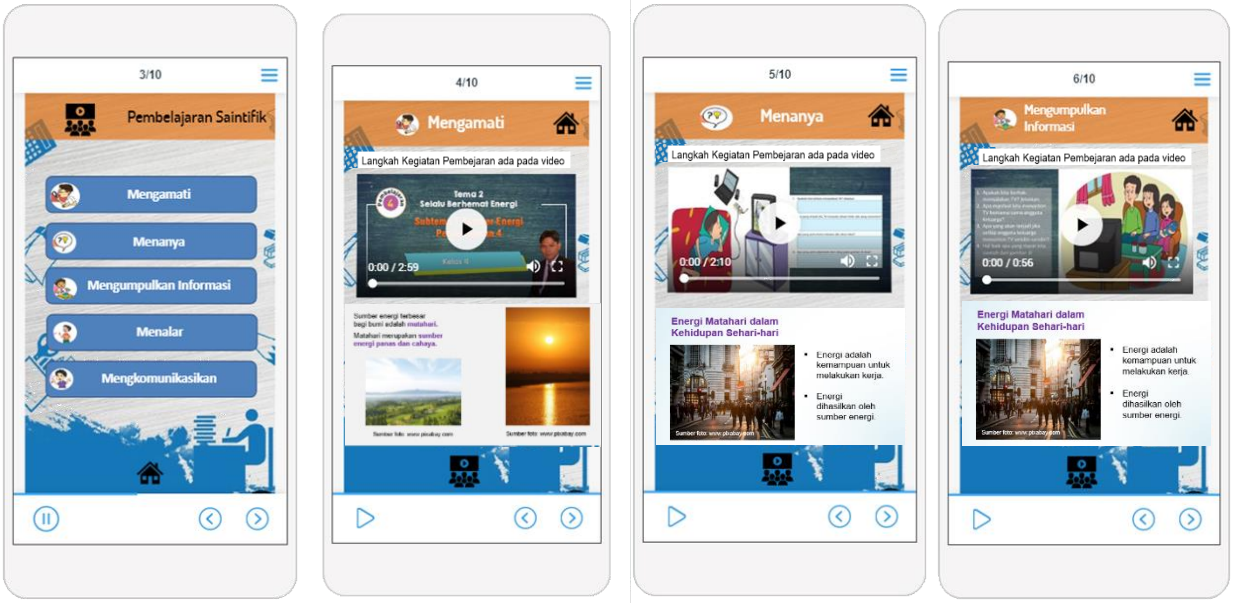

Figure 2: Display of Mobile Learning Applications in the Submenu of Scientific Learning.

Eligibility of Scientific-Based Mobile Learning

Validation results from media experts on the development of mobile learning applications based onscience in elementary school thematic learningtheme 2 Energy Sources obtains the results of the assessment as table 1 below:

Table 1. Material Expert Validation

Material Expert Validation Results		
Aspect	**Percentage**	**Eligibility Criteria**
Theory	91.00 %	Very Worthy
Material Source	89.00%	Worthy
Evaluation	87.00%	Worthy
language	94.00 %	Very Worthy
Total	361.00 %	
Flat–Average Percentage	90.25%	**Very Worthy**

Assessment of the product by material experts, the quality of the mobile learning application obtained from the material review obtained a percentage of 91.00% with very feasible eligibility criteria, while the material source obtained an assessment of 89.00% in the appropriate category, then the evaluation review obtained an assessment result of 87.00% with the appropriate category. worthy. In the linguistic review, it gets a percentage of 94.00% which is included in the very feasible criteria. Overall, the average quality of mobile learning applications from the results of the material validation expert assessment was obtained by 90.25%. based on a review of the validation results by this material, the mobile learning application is

considered very feasible to proceed to the pilot stage. Furthermore, the assessment of media experts obtained data according to table 2 below:

Table 2. Validation of Media Experts

Media Expert Validation Results		
Aspect	**Percentage**	**Eligibility Criteria**
Contents and Display	89.00%	Worthy
Usage Control	93.00 %	Very Worthy
Total	182.00 %	
Flat–Average Percentage	91.00 %	**Very Worthy**

The data obtained from the presentation of Table 2, the assessment of the media validator in the content and display categories received a percentage score of 89.00% with appropriate criteria. In the control aspect, the use of a percentage score of 93.00% with a review of the criteria is very feasible. Thus, the average percentage by media validation experts obtained a score of 91.00% which was included in the very feasible criteria.

The Effectiveness of Scientific-Based Mobile Learning (Through Trial)

In order to find out student responses regarding -based mobile learningscientific, then the researchers conducted trials on students. Researchers communicate with teachers to conduct research in conditions of Limited Face-to-face Learning (PTM). The total number of fourth grade elementary school students at the research site was 42 children. Preparations for implementing student trial research include making application download procedures and application usage tutorials. The assessment of the student trial questionnaire uses a Likert scale of 1 to 5 on the Google Form sent via the WhatsApp application where the research is located. Then, students are directed to download mobile learning applications based onscientific in thematic learningwhich is named thematicku and explains the interesting features in it. The pilot phase by the teacher aims to maximize the use and review of whether the mobile learning application that has been developed can be implemented in student teaching and learning activities. The following is the acquisition of assessment data and feasibility trials by teachers:

Table 3. Test Results by Teachers

Test Results by Teacher		
Aspect	**Percentage**	**Eligibility Criteria**
Materials and Learning	84.00 %	Worthy
Media	91.00 %	Very Worthy
Total	175.00 %	
Flat–Average Percentage	87.50%	**Worthy**

Based on table 3, the results of trials and assessments by teachers on -based mobile learning are obtainedscientific in thematic learningon the material and learning aspects of 82.00% (Fair). Meanwhile, in the media aspect, a score of 95.00% was obtained. So that the average percentage of test results by teachers is 87.50% (Fair). The next stage is the trial by students obtaining the following data:

Table 3. Test Results by Students

Test Results by Students		
Aspect	**Percentage**	**Eligibility Criteria**
Learning	89.00%	Worthy
Media	94.00 %	Very Worthy
Total	183.00 %	
Flat–Average Percentage	91.50%	**Very Worthy**

From the results of the student trial, the data obtained according to table 3 with the results of the learning review obtained the results of the acquisition of an assessment of 89.00%, which means it is feasible to use. Then in terms of the media aspect, it obtained a percentage of 94.00% which means it is very feasible. If it is totaled as a whole and then the average calculation is carried out, then the overall percentage of the results of the trial-based mobile learning application isscientific in thematic learningon theme 2 Energy Sources is declared very feasible. The results of this research and development are in line with previous research, mobile learning based onscientific in thematic learning with innovation efforts to increase student interest in learning activities.

The implementation of thematic learning with a scientific approach can be carried out well because scientific-based mobile learning can be designed because features can contain learning steps that can direct students to go through scientific stages such as observing, asking, gathering information, reasoning and communicating features, and there are additional features such as learning objectives, materials, and questions. In addition, through -based mobile learning media,scientific in thematic learningstudents can access primary school theme 2 Energy Sources learning more easily and practically (Setiani, 2018).

According to (Khairunnisa & et al., 2019), mobile learning learning applications provide new innovations in learning activities in the classroom. Learning applications are easy to use so they can increase maximum productivity even without making a big effort. In addition, the content in mobile learning is fully developed with an attractive appearance to use. In addition, the application of mobile learning learning media for student teaching and learning activities was declared feasible to use because students gave positive responses regarding the use of mobile learning learning media. Thus, mobile learning applications can function as educational media in the implementation of the learning and learning process for students (Hafipz, 2019).

The form of learning uses technology that can be accessed easily anytime and anywhere. While in research (Ardiansyah, 2020), the Android mobile learning learning media is one of the solutions to problems so that students can increase learning motivation and have a positive impact on improving student learning outcomes. This statement is reinforced by (Ardiansyah, 2020), which states that m-learning is useful as a tool for presenting information that makes it easier for students to carry out learning more effectively without any limitations of place and time.

The use of mobile learning provides convenience during teaching and learning activities both in effective learning activities in the classroom and independent learning activities outside the classroom. The function of mobile learning is an increase in student learning motivation so that the material provided by the teacher can be easily understood by students. Students can also learn independently with the help of mobile learning that has been developed. In (Henry et al., 2016) it is stated that mobile learning is a new option for planning and effective learning strategies in an effort to achieve its goals. From the series of descriptions above, it is learned the similarities in the use of mobile learning as a facility that provides

convenience in learning activities. Each of the above studies uses mobile learning with various purposes, including as a medium to increase student interest in learning, educational media in student learning activities, increase learning motivation, and as a strategy in learning activities. While in this study, the development of mobile learning applications based onscientificstrived as a learning medium so that students can learn independently and develop their creative thinking skills.

This scientific-based mobile learning application has advantages and limitations in its use. The advantages of this scientific-based mobile learning application are: (1) Mobile learning packaged in apk file format can be shared via what up (WA) or shareit and can be used on all types of android smartphones so that it can be used by students at any time; (2) The mobile learning application helps students to learn independently so that the use of this application is useful during Limited Face-to-face Learning (PTM) activities; 3 Students can still interact with fellow students, students and teachers, students with learning resources through mobile learning applications while maintaining a distance to comply with health protocols. Meanwhile, the limitations of mobile learning applications that have been developed include: (1) Students must install before they can run mobile learning applications; (2) Assessment of students' creative thinking skills only focuses on the results of the assessment of questions that have been formulated according to indicators of creative thinking abilities; (3) With a small mobile learning device requires students' accuracy in reading each step and the content of the learning material; (4) Users of this mobile learning application can only be accessed by users of android mobile phone operations. (3) With a small mobile learning device requires students' accuracy in reading each step and the content of the learning material; (4) Users of this mobile learning application can only be accessed by users of android mobile phone operations. (3) With a small mobile learning device requires students' accuracy in reading each step and the content of the learning material; (4) Users of this mobile learning application can only be accessed by users of android mobile phone operations.

4. Conclusion

Through the implementation of this research, the implications of the research can be described, namely: (1) Research and Development (R&D) of -based mobile learning applicationsscientific in thematic learningon the theme 2 Energy Sources in grade IV elementary school at SDN 05 Sungai Paduan using the ADDIE development model (2) The results of the assessment from validation experts on the development of mobile learning applications based onscientific in thematic learningon theme 2 Energy Sources obtained a category with very decent results from the assessment by material experts and media experts. (3) The results of the teacher's response to the mobile learning application are feasible, while in terms of student responses, the criteria are very feasible. Thus, the development of mobile learning applications based onscientific in thematic learningon theme 2 Energy Sources is declared feasible to be applied in the fourth grade of elementary school.

Reference

[1] Ardiansyah, A. A. (2020). *Peran Mobile Learning Sebagai Inovasi Dalam Pembelajaran Di Sekolah*. *3*(1), 47–56.

[2] Astuti, Indri. (2020). *Desain Pembelajaran dalam Prespektif Konstruktivistik*. Pontianak: IAIN Pontianak Press.

[3] Branch, Robert Maribe. (2009). *Instructional Design : The ADDIE Approach*. New York: Springer Science & Business Media, LLC.

[4] Darmawan, D. (2016). *Mobile Learning Sebuah Aplikasi Teknologi Pembelajaran*. Jakarta: Rajawali Press.
[5] Dikkers, S., Martin, J., & Coulter, B. (2011). *Mobile Media Learning: Amazing Uses of Mobile Devices for Learning*. Halifax: ETC Press.
[6] Dunne, Richard. 1996. *Pembelajaran Efektif* (Terjemahan). Jakarta: Grasindo.
[7] Ely, D.P. (1972). *The Field of Educational Technology*: A Statement of Definition. Audiovisual Instruction.
[8] Fadhilah Nur, dkk. (2017). Penerapan Pendekatan Saintifik dengan Multimedia untuk Meningkatkan Hasil Belajar IPS Tentang Peristiwa dan Tokoh Proklamasi Kemerdekaan di Kelas V SDN Negeri 2 Tamanwinangun Tahun Ajaean 2016/2017. *Kalam Cendikia*, Volume 5, Nomor 2.1
[9] Fauziah, Resti, dkk. (2013). *Pembelajaran Saintifik Elektronika Dasar Berorientasi Pembelajaran Berbasis Masalah. INVOTEC*, IX(2):165-178.
[10] Hafipz, R. A. K. S. Dan M. K. (2019). *Desain Dan Pembuatan Media Pembelajaran Mobile Learning Pada Mata Pelajaran Sistem Dan Instalasi Tata Udara*. *6*(1), 71–79.
[11] Henry, Muhamad, R., & Nova, D. (2016). *Strategi Pembelajaran Efektif Berbasis Mobile Learning Pada Sekolah Dasar*. 0–14.
[12] Khairunnisa, S., Amirullah, G., & Ninawati, M. (2019). *Jurnal Inovasi Pendidikan Dasar*. *4*(2), 49–56.
[13] Lazim. (2013). "Penerapan Pendekatan Saintifik dalam Pembelajaran Kurikulum 2013". Diunduh dari *https://docplayer.info/72741582-Penerapan-pendekatan-saintifik-dalam-pembelajaran-kurikulum-oleh-m-lazim.html*
[14] Machin, A. (2014). Implementasi Pendekatan Saintifik, Penanaman Karakter Dan Konservasi Pada Pembelajaran Materi Pertumbuhan. *Jurnal Pendidikan (IPA Indonesia)* (Online). (http://journal.unnes.ac.id/nju/index.php/jpii
[15] Mager, Robert F. (1962) *Preparing Instructional Objectives*. California: Lear Sieger.
[16] Mardiana, Elly. (2018) Pengembangan Bahan Ajar Berbasis Pendekatan Saintifik Meningkatkan Kemampuan Literasi Matematika Siswa Pascasarjana, Universitas Negeri Malang. *Prisma* 1 (2018)
[17] Mering, Aloysius. (2020). *Pengembangan Instrumen Penilaian dan Penelitian*. IAIN Pontianak Press: Pontianak.
[18] Rachma, Y.P., Setyadi D., & Mampouw, H.L. (2020). Pengembangan Mobile Learning Barusikung Berbasis Android pada Materi Bangun Ruang Sisi Lengkung. Mosharafa: *Jurnal Pendidikan Matematika*, Volume 9, Nomor 3, September 2020
[19] 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.
[20] Pribadi, R. Benny A., (2018). *Model-Model Desain Sistem Pembelajaran*. Dian Rakyat: Jakarta.
[21] Popham, W. James. (2003). *Teknik Mengajar Secara Sistematis* (Terjemahan). Jakarta: Rineka cipta.
[22] Sari, N. & Anugrahen, I., (2021) Pengembangan Media Pembelajaran Berbasis Android Pada Pembelajaran Tematik Kelas IV Tema 6 Subtema 1 di Sekolah Dasar. *Jurnal Guru Kita*: Vol 5 No. 2
[23] Sarrab, Mohamed, Laila Elgamel, & Hamza Aldabbas. (2012). Mobile Learning (M-Learning) and Educational Environments. International Journal of Distributed and Parallel System, 3(4): p. 35

[24] Seels, B. B., & Richey, R. C. (1994). *Instructional Technology: the definition and Domains of the Field*. Diterjemahlan oleh Y. H. Miarso, D. S. Prawiradilaga, & R. Rahardjo. Jakarta: IPTPI-Unit Percetakan UNJ.
[25] Setiani, P., & Jambi, F. U. (2018). *Media Aplikasi Android Pada Pembelajaran Program Studi Pendidikan Guru Sekolah Dasar Media Aplikasi Android Pada Pembelajaran*. 1–15.
[26] Siregar, Kristian. 2019. "MULTIMEDIA BASED PRAYER LEARNING APPLICATION DESIGNING USING COMPUTER ASSISTED INSTRUCTION (CAI) METHOD." *Jurnal Scientia* 7(2, Feb): 49–54.
[27] Sugiyono. (2016). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
[28] Suharyadi (2013) Exploring "Scientific Approach" In English Language Teaching. Malang: Universitas Negeri Malang.
[29] Sutopo, Ariesto, Hadi.(2012). Teknologi Informasi dan Komunikasi dalam Pendidikan. Graha Ilmu. Yogyakarta
[30] Squire, K. (2009). *Pembelajaran Media Seluler*: *Banyaknya Tempat*. Di Cakrawala 17 (1), 7080.
[31] Tamimuddin H, M. (2007). P*engenalan Media Pembelajaran Berbasis Mobile (Mobile Learning)*. Tersedia di http://p4tkmatematika.org/, diakses [19 Desember 2019]
[32] Wicaksono, D.P., Kusmayati, T A., & Usodo, B. (2014). Pengembangan Perangkat Pembelajaran Matematika Berbahasa Inggris berdasarkan Teori Kecerdasan Majemuk (Multiple intelligences) pada materi balok dan kubus untuk Kelas VIV SEKOLAH DASAR SMP. *Jurnal Pembelajaran Matematika*, 2(5)
[33] Quinn, N., Clark. (2010). *M-Learning : An Introduction to Mobile Learning*. Orlando: Firlandia.