Android-Based Mobile Learning Media Development with Multiple Intelligence of Literate Language Skills on the Fifth Grade Elementary School Students

Imeylia Khabibah; Setya Yuwana; Hendratno

State University of Surabaya, Surabaya, Indonesia

Abstract

The purpose of this study is to develop media mobile learning based android contain multiple intelligence language literacy skills of five grade elementary students. The design of this study is research and development (R&D) which is 4D Model one group pretest and post-test design. The data collection technique that is used in this study is validity, questionnaire, observation, and test. For the data analysis, the researcher used analysis validity media, observation data result, questionnaire data result, and test data result. The findings showed for the test, the researcher used t-test with the level of significance 5% (2,052), so t_value > t_tabel (18, 61 > 2,052). From the result, it can be concluded that there is improving learning outcomes with media mobile learning based android contain multiple intelligence in language literacy skills of five grade elementary students.

Keywords: *Media Mobile Learning Based Android; Multiple Intelligence; Language Literacy Skills*

Introduction

Indonesian Language Learning is very important for the teaching and learning process in Indonesia, which is essentially language learning is learning to communicate both oral and written. Technology is absolutely needed in this fast growing modern era (Prasetyo, Kristiyanto & Doewes, 2019). The effectiveness of learning can be achieved by means of technology and media (Kurniasari, Baedhowi, & Soesilo, 2018). According to Tarigan (2008: 3), language skills include four aspects, namely listening skills, speaking skills, reading skills, and writing skills. Language skills are a bridge of communication in language learning. Two of these language skills are reading skills and writing skills are fundamental skills that must be possessed by students in the industrial revolution era 4.0. Language skills are related to literacy skills that should be one of the important goals in learning. According to Abidin, et al (2018: 1) literacy based on the context of its use is an integration of writing, reading, listening, and speaking skills. The level of understanding of the mastery of science and technology can also increase rapidly if it starts from literacy skills carried out with the appropriate portion.

Along with the development of new technology, teachers also need to think so that students can be used as a source for engaging with digital media in learning. According to Mills (2010: 2) states that the shift in the cultural history of print texts is towards a more prominent point with technological

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developments. The use of smartphones among students is quite a lot, has not been utilized to its full potential to support teaching and learning activities, especially in the language literacy skills of elementary school students. One of the learning media that can answer these demands is by utilizing the Android learning mobile learning media which is used on smartphones / tablets with multiple intelligences. Andorid-based Mobile Learning leads to efforts to change and the development of communication technology in particular (smartphones) in an interactive and communicative way to organize meaningful learning.

This media development is expected to attract students 'interests, sharpen students' creative power when learning, optimize students 'multiple intelligences, create active and innovative learning, train students' self-confidence in conveying ideas both in written or oral form, and so forth. Broadly speaking, Android-based Mobile Learning media in learning is expected to improve the literacy skills of elementary school students.

Every human being with a difference every human being has the most prominent intelligence and this multiple intelligence can be trained. Technological advances can analyze variations or the integration of intelligence in students' learning processes by enabling them to excel in certain learning ways. The development of this media is charged with Compound Intelligence which integrates several text designs and activities as outlined in the Android-based Mobile Learning media which can train multiple students' multiple intelligences, but by specializing in language intelligence (lingusitic intelligence) which is appropriate to be used to improve language literacy skills students, so it is suitable for use in learning Indonesian.

Based on the description above, the researchers are interested in researching and developing research with the title "Development of Android-based Mobile Learning Media with Multiple Intelligences in Class V Literacy Skills for Elementary School Students".

Method

1. Research Type
This study uses the type of research and development or research and development (R&D), which is a research method conducted to test the effectiveness or develop the resulting product.

2. Research Design
The research design used refers to the 4D model which consists of 4 stages which include define, design, develop, and disseminate. The Four-D model was chosen because the stages are coherent, clear, and in accordance with the needs of media development.

3. Research Subjects
The subjects of the study were fifth grade students of Klurak elementary School, Candi District, Sidoarjo Regency in the 2019/2020 Lessons of 28 students.

4. Research Instruments
The research instrument used validation sheets, observation sheets, questionnaire sheets, and pretest and posttest sheets.

5. Data Collection Techniques
   a. Validation
      Media validation will be carried out by two experts namely (1) media experts will validate the presentation of images, sounds, and animations in a technical and structured manner, (2) Indonesian material experts will validate the validity of the content / material based on KI and KD as well as the language validity according to PUEBI on media.

   b. Observation and Questionnaire
      Observations were made during the learning process by two observers. Meanwhile, the questionnaire for teacher and student responses after completing learning.

  c. Test

Tests are given to find out the results of learning language literacy skills which include reading skills and writing skills with pretest and posttest.

6. *Data Analysis Techniques*

  a. Media Validation Analysis

The results of the validated media assessment were concluded in a qualitative descriptive form using a Likert reference. Data generated from validation is in the form of scores. The resulting score will then be calculated using the following formula.

$$\% = \frac{the\ total\ score\ of\ data\ collection}{maximal\ score} \times 100\%$$

<div align="right">(Riduwan, 2013:41)</div>

Android-based mobile learning media is declared valid if the average of the results of the validation get ≥ 66% of the percentage observation criteria table. Analysis of Observation Data The results of observation in the form of scores using the Likert reference. The scores obtained from observations are then processed using the following formula. Android-based mobile learning media is declared valid if the average of the results of the validation get ≥ 66% of the percentage observation criteria table. Analysis of Observation Data The results of observation in the form of scores using the Likert reference. The scores obtained from observations are then processed using the following formula.

$$p\% = \frac{the\ total\ score\ of\ data\ collection}{maximal\ score} \times 100\%$$

<div align="right">(Riduwan, 2013:41)</div>

Android-based mobile learning media is declared practical if the average of the observations of learning implementation get ≥ 66% of the percentage observation criteria table.

  b. Analysis of Questionnaire or Questionnaire Results Data

Questionnaire data obtained through questionnaires from student responses to the Android-based mobile learning media. The measurement scale of the questionnaire data uses the Guttman scale reference. The score is then processed using the following formula.

$$p\% = \frac{the\ total\ score\ of\ data\ collection}{maximal\ score} \times 100\%$$

<div align="right">(Riduwan, 2013:41)</div>

Android-based mobile learning media is declared effective if the average results of the questionnaire or questionnaire responses to the use of Android-based mobile learning media get ≥ 61% of the criteria table for the percentage of student and teacher questionnaires. Data Analysis of Test Results Development research with one-group pretest - posttest design is depicted in the following pattern.

<div align="center">O₁XO₂</div>

Note :

O₁	=	*pretest score (before treatment)*
X	=	*treatment given*
O₂	=	*posttest score (after treament)*

<div align="right">(Sugiono, 2016 : 111)</div>

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The formula for calculating the t-test is shown below;

$$t = \frac{Md}{\sqrt{\dfrac{\Sigma\, x^2 d}{N\,(N-1)}}}$$

Note :

Md = *mean* from the range from *pretest* and *postest*

xd = deviation of each subject

$\Sigma x^2 d$= the total deviation square

N = subject on the sample

d.b = determined by N-1

(Arikunto, 2013:349 - 350).

T-test results are called t arithmetic. After T arithmetic is found compared to theoretical t. Theoretical T is obtained by calculating db = N-1 and looking at the table of values of t. In the table the value of T is used a significant l`evel of 5% which means that the trial error is 5% and the truth when testing is 95%. If the results of the comparison of t arithmetic and theoretical t states t arithmetic ≥ t table, then the use of media has increased from before using the media whereas if t arithmetic ≤ t table, then the use of media has decreased from before using the media.

Research Results and Discussion

1. Android Based Mobile Learning Media with Multiple Intelligences in Language Literacy Skills

This research produces learning media that makes it easy for students to learn reading and writing material and can help teachers deliver the material. Android-based Mobile Learning is an application that is used for learning language literacy skills consisting of material, text, and word games. The learning material in it is Indonesian language material and some fictional texts and nonfiction texts combined with attractive images and sounds, also equipped with videos that support and enhance the attractiveness of android-based mobile learning media. Android-based mobile learning can display learning content by collaborating on unique images, writing, sounds, games and designs so students can enjoy the learning process. Android-based mobile learning is made with Adobe Flash CS 6 software. The features contained in this software are very diverse so that it can be a learning medium. Based on the research results obtained it can be stated that the media can improve language literacy skills in elementary school students.

2. Quality of Android-Based Mobile Learning Media Development with Multiple Intelligences

1. Validity of Media Development

a. Material Validity / Content

Validity is carried out by experts on the validity of the material / content. Researchers conducted the validity of the expert material / content twice. The results of the assessment of the validator average score of material validity / content 3.77 which means that the media can be used without revision with a very good category

b. Validity of Media Voice The validity of the voice in the media is carried out by expert validators from the Education Technology department. The results of the evaluation of the validator average score of validity of the vote is 4 which means that the media can be used without revision in the excellent category.

c. Media Image Validity Media validity is carried out by expert validators from the Education Technology major. The results of the assessment of the average validator score for the validity of the image is 4 which means that the media can be used without revision with a very good category.

d. Validity of Media Languages Validity of the language is carried out by an Indonesian Language expert validator about the validity of the language. the results of the assessment of the validator of the average score obtained from the validity of the language is 3.86 which means that the media can be used without revision with a very good category.

Based on the validity of android-based mobile learning media with multiple intelligence results the validity of the material / content is 94.25; the validity of the sound is 100; the validity of the image is 100; and the validity of the language is 96.5. These data illustrate a conclusion from the results of the validator for android based mobile learning media with compound intelligence developed was 97.69 with excellent categories.
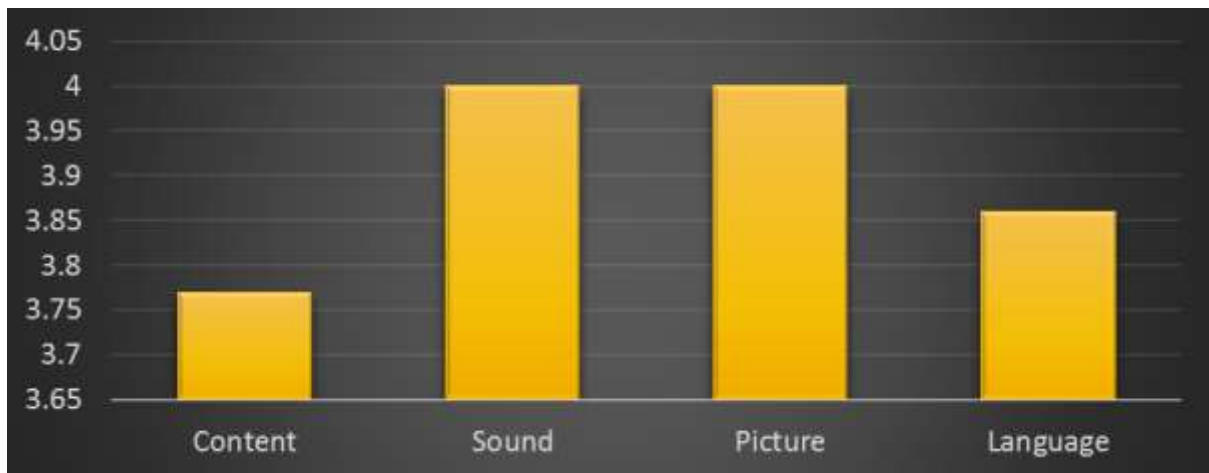

Figure 1. Validity of material / content, sound, image and language results

2. Practicality of Developing Android-Based Mobile Learning Media with Multiple Intelligences

a. Teacher Activities and Student Activities by Using Android-Based Mobile Learning Media with Multiple Intelligence Developed

Teacher activities and student activities in learning activities achieve success if the majority (76% to 99%) of learning materials can be mastered by students. Based on observations of teacher activity and student activity showed 94.23%. This shows that the conclusion obtained from the observation of teacher activity and student activity is that the subject matter can be mastered by students optimally (very well) and students are very active in learning by using Android-based mobile learning media with multiple intelligences.

b. Student Responses Using Android-Based Mobile Learning Media with Developed Multiple Intelligences

The results of student responses using the media developed obtained Very Good assessment criteria (SB) with the results obtained the percentage of student responses was 98.81% which indicates that the Android-based mobile learning media with multiple intelligences gets positive responses from students

c. Teacher's Response by Using Android-Based Mobile Learning Media with Multiple Intelligence Developed

The assessment results obtained based on the mobile learning questionnaire for teachers are very good with a percentage of 100% and the conversion of the teacher response results obtained a value of 100. Based on the data acquisition shows that the developed media received a positive response from the teacher.

Based on the practicality of Android-based mobile learning media with multiple intelligences developed, there are obtained some data results including teacher activities and student activities, namely 94.23; student response results are 98.81; and the results of the teacher's response 100, so the average results of the practicality of mobile-based media based on Android learning compounded intelligence is 97.68 with a very good category.
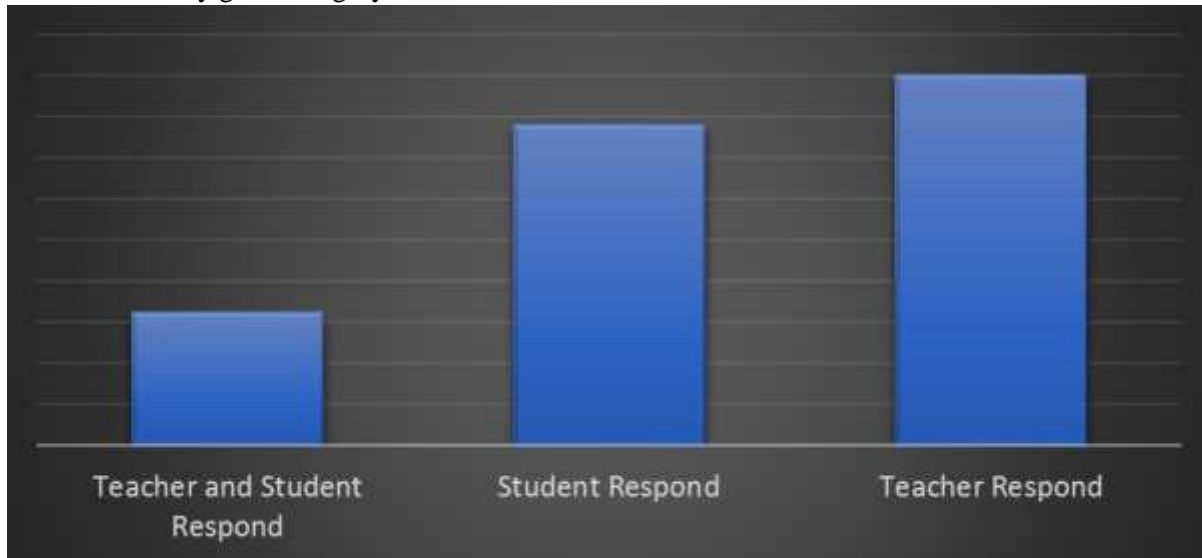

Figure 2. Practical results seen from the activities of teachers and students, student responses, and teacher responses.

3. Effectiveness of Floating Android Based Mobile Learning Media with Multiple Intelligences

The use of mobile learning media based on Android with multiple intelligences in the learning process is carried out after a limited trial. The subjects in this study were all students of class V A of 28 students. Data acquisition in general after doing research, the level of success of class V A students in learning to read and write using android-based mobile learning media with multiple intelligence experiences an increase in students who have finished learning. There was a significant increase in the pretest and posttest activities. There is an increase in the percentage of students who complete learning from 71.43% at pretest to 100% at posttest. So it can be concluded that language literacy skills which include reading and writing activities using android-based mobile learning media loaded with compound intelligence are feasible and effectively used in language literacy skills because it can provide increased student learning outcomes in language literacy skills.

The impact analysis of the application of the developed product is quantitative by using one group pretest posttest design. In this design there are pretest and posttest. This design uses one class and there is no control class. The data analysis technique used by researchers is the data analysis technique of the two free sample t test with the following results.
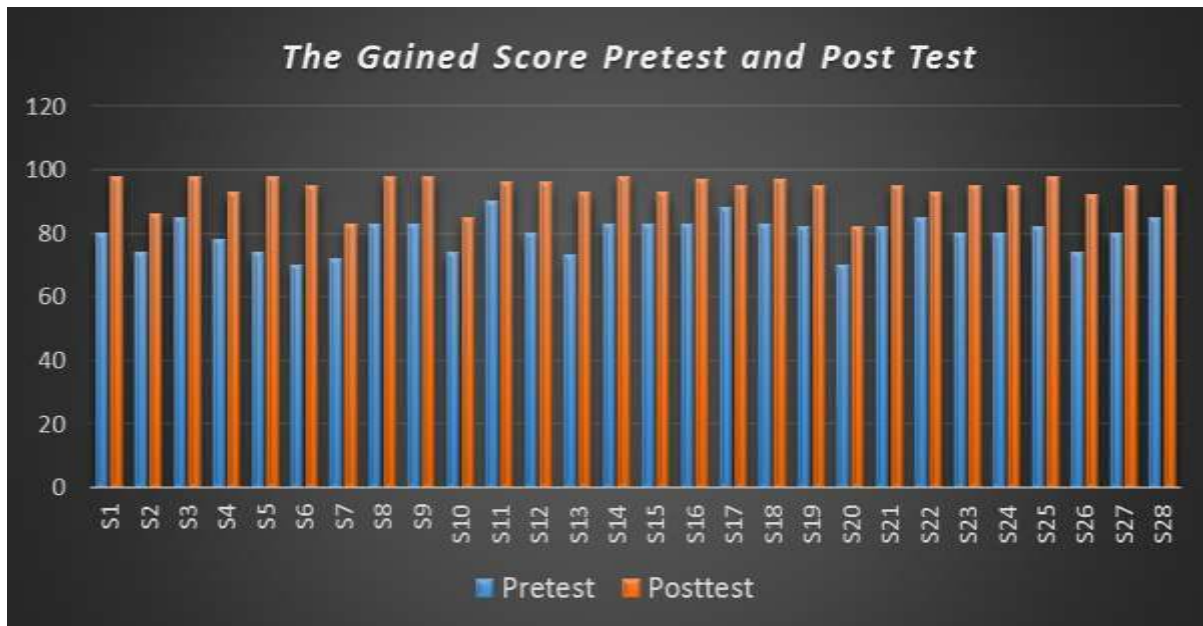
Figure 3. The effectiveness results seen from the acquisition of the pretest and posttest

Based on the calculation of t arithmetic using the formula t-test obtained t count = 18.61, while the t table with a significant level of 5% is known through the degrees of freedom (db) = N-1 - 28 - 1 = 27. So the value of t table = 2,052. This shows that t arithmetic is greater than t table, so it can be written as follows.

$$t_{count} > t_{table}$$
$$18,61 > 2,052$$

This shows that there are differences in student learning outcomes between before and after using the media. So it can be concluded an increase in learning outcomes by using android-based mobile learning media with multiple intelligences. Viewed from the results of learning by using the media, the results are positive. Students are more enthusiastic about literacy in reading and writing, gaining new knowledge, and more careful in writing. Based on the analysis of the validity, practicality, and effectiveness of the Android-based mobile learning media with compound intelligence developed and tested, it can be concluded that in this study the developed media can improve the language literacy skills of elementary school students.

Conclusion

Based on research, it can be concluded that in the development process using the Four-D model which consists of the defining stage (analysis of the root of the problem, students, subject matter, concepts, and formulation of learning objectives for writing). Design phase (media design and media application design). The development stage with two steps, namely (1) expert appraisal followed by revision; (2) development testing (development testing). After passing through several stages, the final form of learning media development is then produced after going through revisions obtained based on the advice of the expert / validator and the results of the trial are the purpose of the development phase.

Media quality includes validity, practicality and effectiveness of the media. The first quality is media validity. Based on the acquisition of values in the validity it can be concluded that the validity results of the Android-based mobile learning media with compound intelligence developed were 97.69 with a very good category.

The second quality of media development is the practicality of the media. Based on the acquisition of values, it can be concluded that the practicality of the Android-based mobile learning media with compound intelligence developed was 97.68 with a very good category.

The third quality of media development is effectiveness based on student learning outcomes in the pretest getting an average score of 79.86 while the learning outcomes of students at the posttest get an average score of 95.43. Based on these data it can be concluded that the success rate of students increased by 28.57%. Then, the results of the t-test calculation show that there is an increase in learning outcomes by using android-based mobile learning media with multiple intelligences.

Based on the results of the quality of media development obtained 97.69 values for validity, 97.68 values obtained for practicality, and 95.43 values obtained for effectiveness, so that the average results obtained for the quality of the development of mobile-based mobile learning media with Android with compound intelligence is 96.93 with a very good category.

Suggestions

Based on the results of this research, this study complements the study of developing android-based mobile learning with multiple intelligences that can be applied in primary schools to complement learning activities by teachers more innovative, effective, and practical so that the quality of learning is better and student learning outcomes improve.

Researchers provide advice to teachers should use the media when delivering subject matter so that students are more motivated and make student learning outcomes increase so that learning is more meaningful. For other researchers who are interested in this research can be used as a reference source when conducting further research on android-based mobile learning media with multiple intelligences.

References

Abidin, Y., et al. (2018). *Pembelajaran Literasi: Strategi Meningkatkan Kemampuan Literasi Matematika, Sains, Membaca, dan Menulis*. Jakarta: Bumi Aksara.

Abidin, Y., et al. (2017). Pengembangan Model Pembelajaran Literasi Berbasis Konsep Multiliterasi, Integratif, dan Berdiferensiasi (MID) di Sekolah Dasar. *Jurnal Cakrawala Pendidikan.* https://doi.org/10.21831/cp.v36i2.13283: 15 Desember 2019.

Arikunto, S. (2013). *Prosedur Penelitian: Suatu Pendekatan Praktek.* Jakarta: Rineka Cipta.

Caverly, D., et al. (2019). Identifying Digital Literacies to Build Academic Literacies. *Journal of College Reading and Learning.* https://doi.org/10.1080/10790195.2019.1638218: 30 Oktober 2019.

Ceha, R., et al. (2016). Peningkatan Kemampuan Guru dalam Pemanfaatan Teknologi Informasi pada Kegiatan Pembelajaran. *Jurnal Penelitian dan Pengabdian Masyarakat.* https://doi.org/10.29313/ethos.v0i0.1693: 15 Desember 2019.

Chen, H. (2017). Exploring The Role of M-Learning In Elementary Education. *Journal of Information Technology Education Center.* https://doi.org/10.28945/3873: 30 Oktober 2019.

Copeland, S. R & Keefe, E. B. (2019). Literacy Instruction for All Students Within General Education Settings. *Journal of Educational Computing Research.* https://doi.org/10.1177/1540796919866011: 12 September 2019.

Crompton, H., et al. (2018). Mobile learning and Student Cognition: A Systematic Review Of PK-12 Research Using Bloom's Taxonomy. *British Journal of Educational Technology.* https://doi.org/10.1111/bjet.12674: 30 September 2019.

Darmawan, D. (2016). *Mobile Learning: Sebuah Aplikasi Teknologi Pembelajaran.* Jakarta: PT. Rajagrafindo Persada.

Gardner, H. (2013). *Multiple Intelligences: Kecerdasan Majemuk*. Terjemahan Alexander Sindoro. Tangerang: Interaksara.

Kayumova, A & Sadykova, G. (2019). Implementing A Multimodal Online Program For Very Young Learners of Russian: Educators' Perspective. *Indonesian Journal of Applied Linguistics.* https://doi.org/10.17509/ijal.v9il.13323: 30 September 2019.

Kurniasari, I. K., Baedhowi., & Soesilo, A. M. (2018). Development of mobile educational game of economics. *International Journal of Multicultural and Multireligious Understanding*, 3(4), 355-362.

Mayer, R. E. (2009). Multimedia Learning: Prinsip-prinsip dan Aplikasi. *Jogjakarta: Pustaka Pelajar.*https://doi.org/10.23917/varidika.v24i4.707: 15 Desember 2019.

Minsih & Murfiah. (2012). Pendidikan Karakter Berbasis Kecerdasan Majemuk dalam Membentuk Kemandirian Siswa SD Muhammadiyah Program Khusus Kota Surakarta. *Varia Pendidikan.* https://doi.org/10.23917/varidika.v24i4.707: 15 Desember 2019.

Muslimin. 2018. Penumbuhan Budaya Literasi Melalui Peningkatan Minat Baca Masyarakat Desa. *Jurnal Ilmiah Pendidikan.* https://doi.org/10.21831/cp.v37i1.17141: 15 Desember 2019.

Nurgiyantoro, Burhan. (2010). *Penilaian Pembelajaran Berbahasa Berbasis Kompetensi.* Yogyakarta: BPFE.

Pereira, I. S. P & Riano, X. A. G. (2016). Elementary students's perspectives on a curriculum for literacy education. *Research Papers in Education.* http://dx.doi.org/10.1080/02671522.2016.1270999: 12 September 2019.

Prasetyo, H., Kristiyanto, A., & Doewes, M. (2019). The development of Android-based mobile learning media in healthy lifestyle teaching materials for senior high school students. *International Journal of Multicultural and Multireligious Understanding,* 6(2), 188-194.

Rahmawati, I., et al. (2019). Pemahaman Konsep Belajar untuk Mengasah Kecerdasan Majemuk (Pendekatan Penelitian Tindakan). *Psycho Idea.* https://doi.org/10.30595/psychoidea.v17i1.3693: 15 Desember 2019.

Risko, V. J., & Reid, L. (2019). What Really Matters for Literacy Teacher Preparation? *International Literacy Association.* https://doi.org/10.1002/trtr.1769: 30 September 2019.

Safitri, L., et al. (2019). Pengaruh Membaca 15 Menit Terhadap Minat Baca Siswa Sekolah Dasar. *Jurnal Cakrawala Pendidikan Dasar.* http://dx.doi.org/10.31949/jcp.v5i2.1387: 15 Desember 2019.

Siregar, S. (2014). *Statistik Parametrik untuk Penelitian Kuantitatif : Dilengkapi dengan Perhitungan Manual dan Aplikasi SPSS Versi 17.* Jakarta: Bumi Aksara.

Slavin, R. E. (2008). *Psikologi Pendidikan Teori dan Praktek.* Jakarta: Indeks.

Sofiya, Ana. 2018. *Pengembangan Media Pembelajaran Bahasa Indonesia Berbasis Sparkol Videoscribe untuk Meningkatkan Keterampilan Menulis pada Siswa Sekolah Dasar* (tesis magister pendidikan). UNESA.

Sugiyono. (2016). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D).* Bandung: Alfabeta.

Sun, Z., et al. (2018). Detecting the correlation between mobile learning behavior and personal characteristics among elementary school students. *Interactive Learning Environments.* https://doi.org/10.1080/10494820.2018.1428633: 12 September 2019.

Suryaman, M. (2015). Analisis Hasil Belajar Peserta Didik dalam Literasi Membaca Melalui Studi Internasional (PIRLS) 2011. *Litera.* https://doi.org/10.21831/ltr.v14i1.4416: 15 Desember 2019.

Sung, H. Y., etc al. (2019). Development of Mobile Learning System Based on A Collaborative Problem-posing Strategy. *Interactive Learning Environments.* https://doi.org/10.1080/10494820.2013.867889: 30 September 2019.

Tabiin, A. (2017). Penerapan Konsep Pembelajaran Berbasis Kecerdasan Majemuk (Multiple Intelligence) pada Anak Usia Dini. *Jurnal Pendidikan Islam.* https://doi.org/10.28918/jei.v2i1.1629: 15 Desember 2019.

Tarigan, H. G. (2013). *Menulis Sebagai Suatu Keterampilan Berbahasa.* Bandung: Aksara.

Traxler, J. M. (2017). Learning with Mobiles in Developing Countries: Technology, Language, and Literacy. *International Journal of Mobile and Blended Learning.* https://doi.org/10.4018/IJMBL.2017040101: 30 September 2019.

Tsouccas, L. F. I & Mavrotheis, M. M. (2019). Enhancing in Service Primary Teachers' Technological, Pedagogical and Content Knowledge on Mobile Mathematics Learning. *International Journal of Mobile and Blended Learning.* https://doi.org/10.4018/IJMBL.2019070101: 30 September 2019.

Wang, X., & Xing, W. (2018). Understanding Elementary Students' Use of Digital Textbooks on Mobile Devices: A Structural Equation Modeling Approach. *Journal of Educational Computing Research.* https://doi.org/10.1177/0735633118758643: 30 Oktober 2019.

Wijaya, R. A., & Mulyati, Y. (2018). Sastra Dongeng dalam Pembelajaran Membaca dan Menulis Permulaan. *Jurnal Pendidikan Bahasa dan Sastra Indonesia.* http://dx.doi.org/10.33603/deiksis.v5i1.860: 15 Desember 2019.

Williams, E. (2017). *Pendidikan Literasi : Panduan Belajar Mengajar untuk Ruang Kelas dengan Kecerdasan Majemuk.* Bandung: Nuansa Cendekia.

Yaumi, M., et al. (2018). Investigating Multiple Intelligence-Based Instructions Approach on Performance Improvement of Indonesian Elementary Madrasah Teachers. *Sage Open Journal.* https://doi.org/10.1177/2158244018809216 : 12 September 2019.

Yuliyati. (2014). Model Budaya Baca-Tulis Berbasis Balance Literacy dan Gerakan Informasi Literasi di SD. *Jurnal Ilmu Pendidikan.* http://dx.doi.org/10.17977/jip.v20i1.4386: 15 Desember 2019.

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