

Conference Paper

Designing an Augmented Reality-Based Eduplay Learning Media to Improve Early Childhood Reading Skills

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Abstract.

This study aimed to develop an eduplay learning media designed to improve early childhood reading skills. This research used the ADDIE method (Analysis, Design, Development, Implementation, Evaluation). However, this article only discusses the design stage. The subjects of this study were 5th semester students of the Early Childhood Education Study Program and were selected using the purposive sampling method. The results of this study are that augmented reality-based eduplay learning media have a feasibility percentage of 92.5% by media experts and 90% by material experts. Thus, eduplay learning media is appropriate for improving early childhood reading skills.

Keywords: eduplay, augmented reality, reading skills

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Published 21 December 2022

Publishing services provided by
Knowledge E

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Selection and Peer-review under the responsibility of the ICESRE Conference Committee.

1. Introduction

Reading literacy development in early childhood is a very important process in starting individual education and parenting (1). Children's reading ability is often assumed to reflect literacy between parents and children, so there is a significant correlation in accompanying early childhood development (2). In young children, better pre-reading skills indicate that there is a relationship between functional connectivity and pre-reading language skills are evident in children even before formal reading instruction (3). In formal schools, it is very important to have an assessment to measure reading skills including increasing the number of vocabulary (4).

Early childhood educators' challenge is to optimally develop children's intelligence through creative and innovative learning media (5). The use of game-based learning

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media can help students understand various types of professions so that children can explore their interests through the Edu-Games My Profession application which is suitable for use (6). Technology-based learning media has been able to provide change and is no longer a trend, but has been implemented into a learning necessity (7). Game-based learning has had a positive effect on cognitive and affective aspects and was able to improve student learning outcomes (8).

The ability to read early childhood is a challenge for prospective teachers, namely students in semester 5 to be able to implement it in learning. The teacher candidates still have difficulty in teaching basic reading. They need innovative learning media to improve early childhood reading skills. Game-based learning media in the form of educational games is a very effective alternative to be applied in the classroom and can activate student activities so that learning is more meaningful (10). This is supported by research that has been conducted (9) which concludes that game-based learning has affected students' learning motivation and prepared students to face problems in the real world.

Eduplay is an example of technology that can help educators improve student learning experience. This app allows self-access for interactive game-based learning (11). Research conducted by (12) concluded that learning augmented reality-based educational games positively affects learning at universities. Innovative learning media can increase students' understanding of the concepts given by educators and provide higher learning completeness (13). Therefore, researchers want to develop an augmented reality-based eduplay learning media design to improve early childhood reading skills.

2. Method

This research is research and development that is used to produce eduplay learning media products based on augmented reality to improve early childhood reading skills. Subject this research is the 5th semester students of early childhood education study program. The development procedure using the ADDIE model is (1) analysis, (2) design, (3) development, (4) implementation, (5) evaluation. The analysis stage in this case is a performance analysis and needs analysis related to learning media development. In the design stage, it is necessary to classify learning programs designed to achieve learning objectives, namely the ability to read early childhood. the development stage, the framework that has been designed will be realized into products that can be

implemented, namely augmented reality-based eduplay products. At the implementation stage, researchers apply the resulting product into learning. At the evaluation stage, compare the learning outcomes that have been achieved with the goals that have been formulated previously. However, this article only discusses the product design stage until material experts and media experts have tested its feasibility. The procedure can be seen in Figure 1.

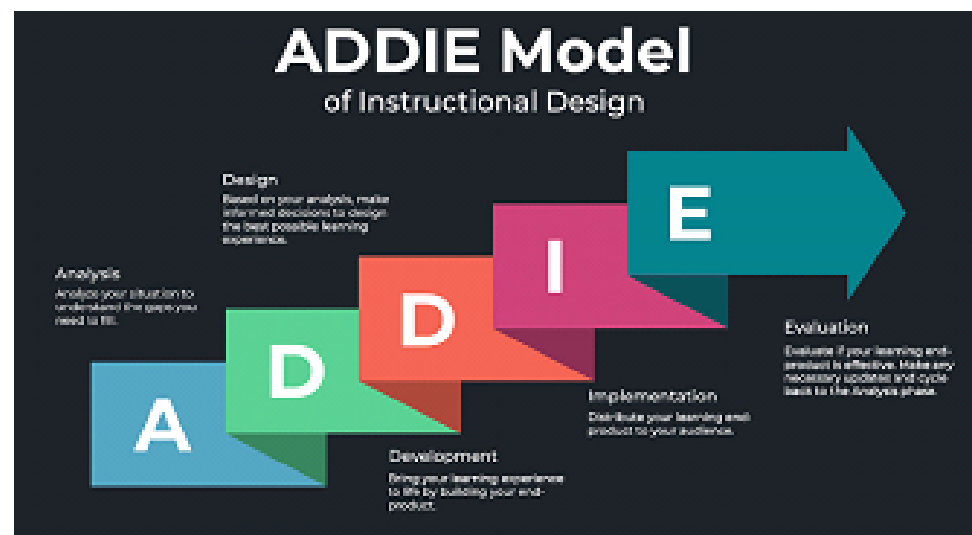


Figure 1: ADDIE Model.

3. Result and Discussion

Based on the ADDIE model procedure, the stages of implementing this research and development are as follows:

3.1. Analysis

At the analysis stage, the researcher conducted a needs analysis to develop learning media in the form of augmented reality-based eduplay products. The analysis was conducted through interviews with prospective teachers in the 5th semester of the early childhood education study program to find out the extent of the difficulties in teaching reading skills. Based on the results of interviews, it is known that there are still difficulties in teaching students to read, and there is still a lack of utilization of technology-based learning media. Therefore, it is necessary to develop learning media that can overcome these problems. After analyzing the needs of the newly developed media, media analysis needs to be done to determine the feasibility of the media if applied. At this stage, the

researcher will conduct a preliminary analysis, namely analyzing the learning tools, including the syllabus, lessonplans, and learning objectives on basic reading materials.

3.2. Design

At this stage, the researcher designs the product to be developed, namely an augmented reality-based eduplay product based on the analysis done in the previous stage. The software used in making the design is Blender and Unity software. The display of instructional media design can be seen in Figure 2.



Figure 2: Book version of eduplay learning media design.



Figure 3: Augmented reality version of eduplay learning media design.

3.3. Development

At the development stage, researchers packaged trigonometry material into a virtual reality -based learningmedia. Then, validation of media and material experts was carried

out to see the feasibility of the product. The results of expert validation calculations are as follows:

1. Media Validation

Media experts assess augmented reality-based eduplay learning media by filling out a questionnaire. The questionnaire that the material expert filled out had four aspects, namely the general appearance aspect, language feasibility, media presentation, and visual communication. The validation results from media experts can be seen in table 1.

TABLE 1: Media expert validation results.

No	Aspects of media expert assessment	Desired score	Rating score	Eligibility percentage
1	General Appearance	20	18	90,00 %
2	Media Presentation	20	18	90,00 %
3	Language Feasibility	15	15	100 %
4	Visual Communication	20	18	90,00 %

In the calculation of media expert validation, the percentage of the feasibility of augmented reality-based eduplay learning media is 92.5%. After converting to scale, the conversion is within 81% - 100% range. Thus, the media meets the criteria very well. Media expert comments in general are augmented reality-based eduplay learning media is a very interesting medium for early childhood in practicing reading skills. Children try to understand objects in the surrounding environment through books that are visualized through augmented reality. Thus, students not only learn to read but also learn to understand concepts about the surrounding environment that make children enjoy using eduplay products. This is supported by research conducted by (14) concluding that Augmented Reality (AR) as a learning medium greatly influences children's potential by showing 3D models on smartphone screens and can improve student learning outcomes.

1. Material Validation

Material experts provide an assessment of the augmented reality-based eduplay learning media through filling out a questionnaire. The questionnaire filled out by material experts has 4 aspects: aspects of material substance, use of language, utilization and evaluation of questions. The results of this material expert validation can be seen in table 2.

Based on the material expert validation calculations above, the percentage of eligibility Augmented reality-based eduplay learning media is 90%. Then, converting to

TABLE 2: Material expert validation results.

No	Aspects of media expert assessment	Desired score	Rating score	Eligibility percentage
1	Material Substance	20	18	90,00 %
2	Use of Language	15	14	93,33 %
3	Utilization	15	13	86,67 %
4	Evaluation of Questions	10	9	90,00 %

scale conversion is in the range of 81% - 100%. So it shows that the media meets the criteria very well. Comments from material experts in general are The media is very good because it contains reading material systematically starting from the letters of the alphabet a to z according to the learning objectives. Furthermore, the reading technique is also per word according to objects around early childhood and is packaged attractively to increase children's motivation to learn to read. This is supported by research conducted (14) which states that the use of augmented reality (AR) technology as a form of digital technology is increasing, allowing individuals to interact with real and virtual objects (15).

4. Conclusion

The results of this study are augmented reality-based eduplay learning media reach a feasibility percentage of 92.5% by media experts and 90% by material experts. Thus, eduplay learning media is appropriate to be used to improve early childhood reading skills.

Acknowledgements

We thank those who have supported the writing of this article, namely (1) Sekretariat Direktorat Jenderal Pendidikan Tinggi, Riset dan Teknologi Kementerian Pendidikan dan Kebudayaan, Riset dan Teknologi, (2) Universitas PGRI Semarang, and (3) PT. Campus Digital Indonesia.

References

[1] Wildová R, Kropáčková J. Early childhood pre-reading literacy development. *Procedia Social and Behavioral Sciences*. 2015;191:878–883.

- [2] van Bergen E, van Zuijen T, Bishop D, de Jong PF. Why are home literacy environment and children's reading skills associated? What parental skills reveal. *Reading Research Quarterly*. 2017;52:147–160.
- [3] Benischek A, Long X, Rohr CS, Bray S, Dewey D, Lebel C. NeuroImage pre-reading language abilities and the brain's functional reading network in young children. *Neuroimage*. 2020;217:116903.
- [4] Goodwin AP, Petscher Y, Jones S, McFadden S, Reynolds TL D. The monster in the classroom: Assessing language to inform instruction. *The Reading Teacher*. 2020;73:603–616.
- [5] Sari NE, Suryana D. Thematic pop-up book as a learning media for early childhood language development. *JPUUD - Jurnal Pendidik Usia Dini*. 2019;13:43–57.
- [6] Rais M, Aryani F, Ahmar AS, Arfandi H, Ahmad WKS. Learning media edu-games "my profession" as an effort to introduce various types of profession in early childhood education students. *Journal of Physics: Conference Series*. 2018;1028.
- [7] Praherdhiono H, Pramono Adi E, Prihatmoko Y. Strengthening performance for teachers in early childhood education with heutagogy on the utilization of digital learning media and sources. 2018;244:74–79.
- [8] Pratama LD, Setyaningrum W. Game-based learning: The effects on student cognitive and affective aspects. *Journal of Physics: Conference Series*. 2018;1097.
- [9] Jääskä E, Lehtinen J, Kujala J, Kauppila O. Game-based learning and students' motivation in project management education. *Project Leadership and Society*. 2022;3.
- [10] Sunandar S, Rahmawati ND, Wibisono A, Buchori A. VAR based (virtual augmented reality) education game dissemination in geometry learning at unissula Semarang. *SSRN Electron Journal*. 2021:1–17.
- [11] Binti E, Ridzwan M, Haniesya N, Farid B, Syarina F, Misni B. Eduplay dashboard application. *Indonesia: I-JaMCSIIIX*; nd. p. 191–193.
- [12] Rahmawati ND, Buchori A, Wibisono A. Effectiveness of VAR (virtual augmented reality)-based educational games in trigonometry learning in university. *Proceedings of 2nd International Conference on Educational Technology (ICETECH 2021)*. 2022;630:266–269.
- [13] Rahmawati ND, Buchori A, Hafidz M, Ghoffar A. The effectiveness of using virtual reality-based mathematics learning media with an ethnomathematical approach. *4th International Conference on Education and Social Science Research*. 2022;2022:1005–1011.

- [14] Utami IWP, Lutfi I, Jati SSP, Efendi MY. Effectivity of augmented reality as media for history learning. *International Journal of Emerging Technologies in Learning*. 2019;14:83–96.
- [15] Madanipour P, Cahrssen C. Augmented reality as a form of digital technology in early childhood education. *Australasian Journal of Early Childhood*. 2020;45:5–13.