Development of Early Childhood Dance Pattern Module with Augmented Reality (AR)

Retno Tri Wulandari, Leni Gonadi*, Suryadi, Munaisra Tri Tirtaningsih

Department of Early Childhood Education, Universitas Negeri Malang
Jl. Semarang No 5, Malang, East Java, Indonesia, Postal Code 65145
*Corresponding author, e-mail: leni.gonadi.fip@um.ac.id

ARTICLE INFO	ABSTRAK

Media pembelajaran yang dapat menjembatani dunia maya dan dunia nyata menjadi kebutuhan dalam meningkatkan pemahaman mahasiswa tentang pola lantai tari anak usia dini. Penelitian ini bertujuan untuk mengembangkan modul pola tari anak usia dini dengan teknologi augmented reality yang layak dan praktis. Model ADDIE yang meliputi analisis, desain, pengembangan, dan implementasi menjadi model pengembangan yang digunakan oleh peneliti. Hasil penelitian ini adalah: (1) penilaian kelayakan media oleh ahli media dan ahli materi berada pada kategori layak dengan prosentase 75 persen dan 83 persen; (2) penilaian kepraktisan oleh pengguna yaitu mahasiswa dari dimensi kebermanfaatan media 87,75 persen, dimensi desain 86,7 persen dan dimensi bahasa 91,8 persen sehingga modul dikatakan praktis. Maka, modul pola tari anak usia dini dengan teknologi augmented reality yang dikembangkan layak dan praktis untuk digunakan pada proses pembelajaran mahasiswa pada matakuliah seni tari anak usia dini.

ABSTRACT

Learning media that can bridge the virtual world and the real world is a necessity in increasing students' understanding of dance floor patterns for early childhood. The research aims to develop a dance pattern module for early childhood with augmented reality that is feasible and practical. The ADDIE model, which includes analysis, design, development, and implementation, becomes the development model used by the researchers. The results of this study are: (1) media feasibility assessment by media experts and material experts is in the appropriate category with a percentage of 75 percent and 83 percent; (2) the practicality assessment by users, namely students from the media usefulness dimension, is 87.75 percent, the design dimension is 86.7 percent, and the language dimension 91.8 percent so that the module is said to be practical. In conclusion, the developed early childhood dance pattern module with augmented reality is feasible and practical to use in the student learning process in early childhood dance art courses.

INTRODUCTION

The development of early childhood dance art is one of the courses of the Early Childhood Education Teacher Education Study Program (PGPAUD) Universitas Negeri Malang. This course provides scientific provisions for students to understand the concept of early childhood dance art to create a dance work for early childhood. In the process of creating dance works or early childhood dance choreography, it is necessary to understand the stages that include several things adapted to the child's characteristics and the purpose of choreography for early childhood in the context of art education. The context of choreography in early childhood education is not to educate the child to become a professional dancer but to help the growth and development of all aspects of the child. Some of the purposes of the aged dance choreography are a means to (1) help prepare children to be creative and innovative, have a high sensitivity to educational goals, (2) to strengthen the concept of space-time and energy concerning children's gestures, both individually and together with others, (3) strengthening the emergence of pride in efforts to develop control and movement skills, (4) develop imagination with friends, and be able to feel and give reactions, (5) encourage children's creativity in exploring and discussing ideas, as well as increasing the value of self-control and appreciation of other people's ideas or the achievements of others, (6) stimulating the emergence of critical attitudes and self-control (Wulandari et al., 2020).

One of the characteristics of dance choreography applied to early childhood education is the floor pattern called formation. Using a variation of floor patterns recommends making choreography for early childhood. The aim is for the child to participate in dance activities happily and understand the concept of space and position without coercion. The variations carried out are limited to floor patterns, making it easier for children to remember their position precisely. The shape of the given floor pattern must also be simple and make it easier for children to move to follow the pattern they are making. A choreography or choreographer, a dance creator, is sure to have high initiative, especially in determining choices for a dancer who will perform the results of his choreography (Sutarno, 2012). It is a challenge for students as choreographers to determine the shape of the floor pattern appropriate for early childhood. The obstacle faced by students is the difficulty of translating these floor patterns in making dance artwork. Students have difficulty visualizing dance floor patterns that are specifically for early childhood. There happened because the media is only in the form of a picture of the dance floor pattern equipped with a brief description. Theoretical and practical aspects become the introductory provisions of a dancer in realizing the creation (Sutarno, 2012). Students hope that there is a learning media that can bridge the virtual and real worlds, increasing students' imagination about early childhood dance floor patterns that provide a complete or three-dimensional picture of floor pattern movements to provide students with an understanding of the concept.

The module becomes a medium to use specifically, systematically, and equipped with instructions that contain learning experiences following learning materials that allow it to be learned independently or guided. However, the module used in the lecture process for developing early childhood dance art is in the form of a hardcopy equipped with two-Dimensional (2D) images. It has not provided visualization of the dance floor pattern those students expect. Modules contain subject matter and are present in printed form. However, the characteristics of the module itself guide students to their learning achievements according to their abilities, in contrast to the concepts of package books or textbooks (Pradana et al., 2020). Technology advances in Augmented Reality (AR) based learning that combines real and virtual environments in three-dimensional (3D) form. AR technology is a very effective tool that integrates the real learning world with the virtual world created by computer software. In this way, learners can obtain more than that only from textbooks and will be more motivated to conduct experiments (Pengcheng et al., 2011). The results showed that AR is a technology used in education in various fields. Based on these characteristics, AR stands out as an effective educational tool for different sample levels and training in diverse fields (Sirakaya & Sirakaya, 2018; Sırakaya & Sırakaya, 2020). AR technology is an effective tool that integrates the real learning world with the virtual world created by computer software (Rasalingam et al., 2014). AR is a new technology that bridges the natural world and virtual environments by providing synchronous interactions. The existence of features AR can

help students play an active role in the learning process (Kelly et al., 2018), where technological developments can help students learn independently and add their own experience with limited facilities and designs of teaching materials that are relevant today (Adhikari et al., 2016; Hsiao et al., 2012). In the process of making early childhood dance choreography, the main thing that students need to know and understand is an understanding of the concept of floor patterns. Therefore, this study aims to develop an AR application based on an early childhood dance floor pattern intended for PGPAUD Universitas Negeri Malang students. The specific research questions in this study are 1) How to design the early childhood dance floor pattern AR module, and 2) Assess the feasibility and practicality of the resulting early childhood dance floor pattern AR module.

METHOD

This study applies the ADDIE research model to produce AR for the early childhood dance choreography module. The ADDIE model is one of the learning system design models that shows the primary stages of a simple and easy-to-learn learning system, consisting of 5 phases: analysis, design, development, implementation, and evaluation (Branch, 2009). This study focuses on the model's four stages, namely the implementation stage. The research began with an analysis of the needs of the lecture process in the early childhood dance course at the PGPAUD Study Program, the Universitas Negeri Malang, which analysing with supporting theories. Furthermore, the research continued by designing the module design and developing AR technology on the module. The process of modules with AR technology is then tested for feasibility by media experts and module material experts who focus on early childhood dance floor patterns. Finally, the module tested for its practicality by prospective module users, namely students. The stages of the research process are in Figure 1.

Analysis phase

The development of the early childhood dance floor pattern AR module begins with analyzing the needs of students in attending lectures on the development of early childhood dance arts. Students who take early childhood dance courses state that creating dance artworks for early childhood requires understanding the concept of dance floor patterns. Unfortunately, the lecture modules used so far have not been able to facilitate this, and students need more time because they are looking for other media references to provide an accurate picture of the intended floor pattern. Therefore, students hope there is a learning media that can bridge the virtual and real worlds, increasing students' imagination about early childhood dance floor patterns that provide a complete or three-dimensional (3D) picture of concrete floor pattern designs. Students need this as a provision for the final project in making dance works for early childhood dance choreography. To become a choreographer, they do not only study theoretically but also practice in the form of a work.
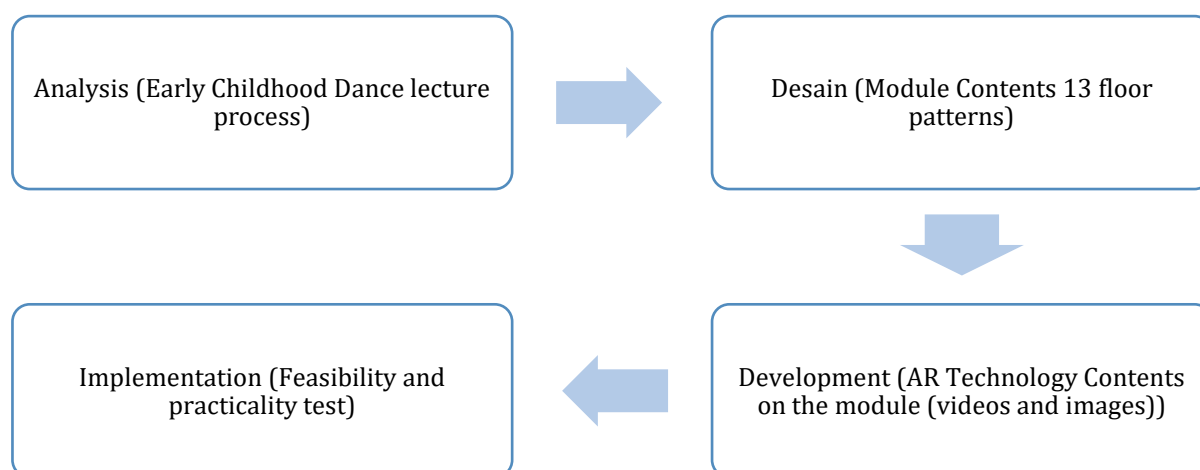

Figure 1. Phases of research

However, a choreographer can be an observer who can think critically and give input to a choreographic work (Hadi, 2012). Therefore, AR should be included in higher education to provide the conditions for learning in an interactive virtual environment and achieve a high level of visualization through the tools preferred by digital students today. Opportunities for easier and more accessible learning of the subject matter, acquiring more knowledge in a short period developing students' creative thinking and generally its application can improve the quality of education (Videnov et al., 2018).

Design phase

Based on the analysis of these problems, researchers compiled the module's contents consisting of graduate learning outcomes, course learning outcomes, and early childhood dance floor pattern AR module consisting of thirteen-floor patterns and equipped with dance work consultation sheets. This module with a view reflects the contents of the developed module, as shown in Figure 2.

Development phase

The module's content at the next stage is equipped with AR technology, and the process includes the selection of videos and images used with AR applications. So the use of video selection and images are used with AR applications. Collaboration between art and technology creates artistic performances (Listiani et al., 2019). So the use of AR can be a solution in the future so that the cultural arts of the archipelago can be studied and developed so that they remain sustainable while keeping the ancestral heritage from becoming extinct (Mustika et al., 2015).

Images and videos are documentation from researchers selected according to the needs of the concept of dance floor patterns that are specifically applicable to early childhood. Working on the AR dance floor pattern recognition module appeals to the visual performance of the basic dance form (Herdiani, 2020).

Implementation phase

The module of early childhood dance floor patterns equipped with AR technology was then tested for aspects of the feasibility and practicality of the module when used by students in the lecture process. The feasibility aspect is through an assessment from material experts and media experts on the early childhood dance pattern module before being tested on potential users, namely students. The module is said to be feasible if the resulting percentage value is above 75% of the maximum value of the 100% percentage. The feasibility value of a product meets the elements very feasible with a percentage value of 76% - 100% (Arikunto, 2006) .

Gambar 3.21 desain lantai diagonal
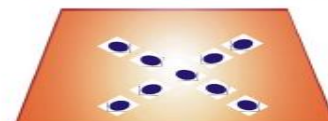
Gambar 3.22 desain lantai X

Gambar 3.23 desain lantai V terbuka

Figure 2. Cover design and module content

RESULT

The use of technology can create fun, attractive learning and functions as a place to preserve dance. This method is used to make it easier for anyone to know, learn, and preserve it. Not limited to space and time, whenever and wherever it can be accessed and studied (Daryanti, 2019).

Early childhood dance floor pattern module design

The results of research conducted on the development of books with AR technology show that books with AR technology can support observation, experimentation, and simulation activities because AR technology can display animation, sound, and video (Permana et al., 2019). In the future, AR technology will greatly change human life, which is an inevitable trend in the development of science and technology (Chen et al., 2019). The resulting early childhood dance floor pattern module is equipped with AR technology that can be accessed via a smartphone by scanning images on a module that presents examples of dance videos rather than visualized floor patterns to facilitate student understanding, as shown in Figure 3 and Figure 4.
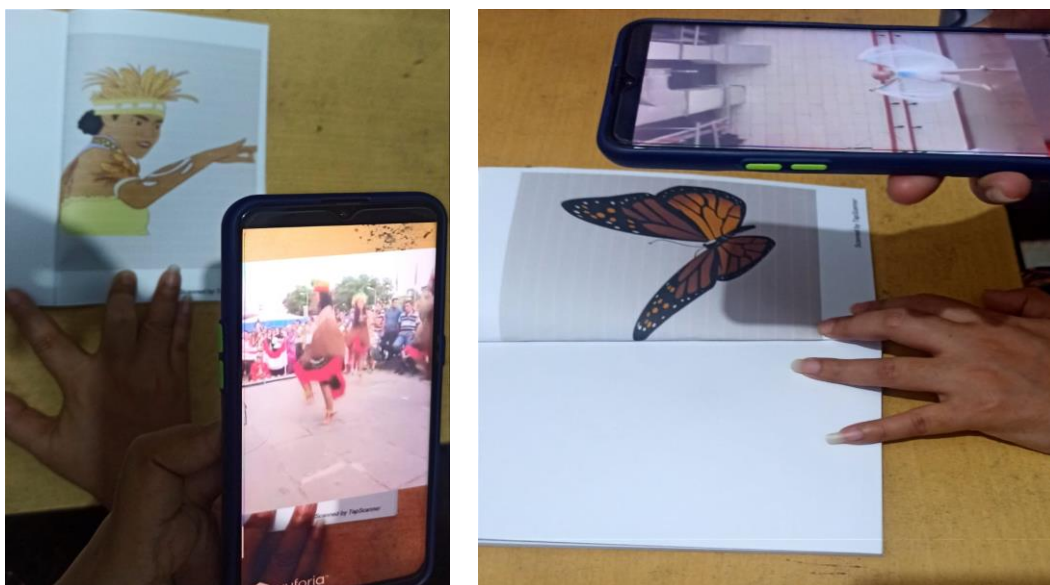

Figure 3. AR module display

Figure 4. AR floor pattern

Feasibility and practicality of early childhood dance floor pattern module

The modules were then tested for feasibility by material experts and media experts. Figure 5 demonstrates the results of the material expert test by dance education experts from the Department of Art and Design, Faculty of Letters, and media experts from the Faculty of Education, Universitas Negeri Malang.
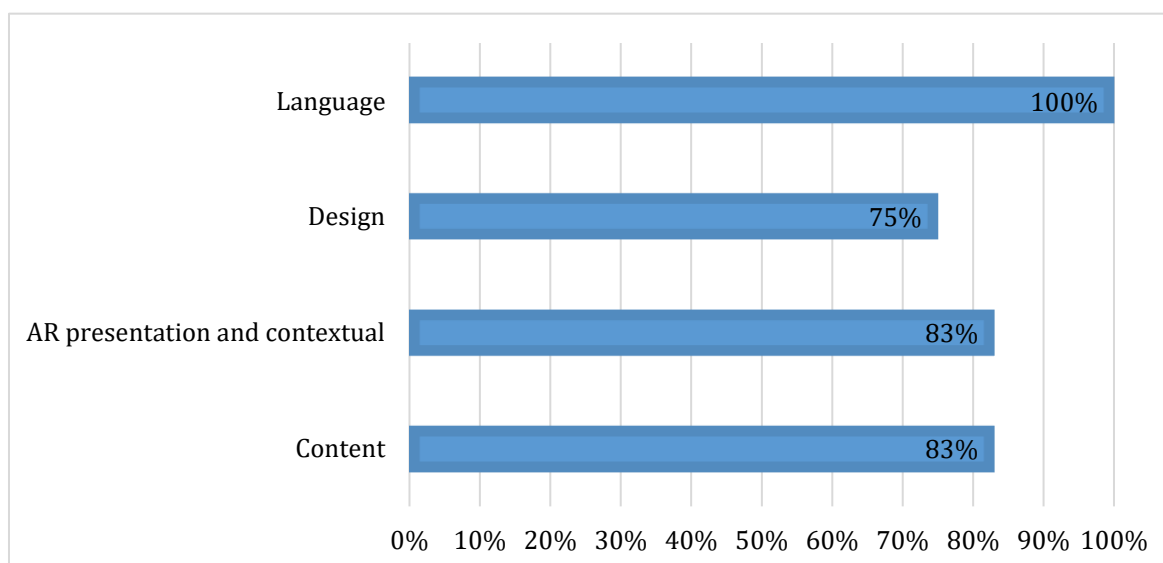

Figure 5. Expert validation results

The results of the material expert test from the dimensions of the contents was 83% of the total fullness of 100%, which means that from this dimension, it is feasible. The presentation and contextual dimensions account of 83% of the total fullness of 100% means that from these dimensions, the module is said to be feasible. Based on expert tests in terms of material presented, the early childhood dance choreography module is feasible to be tested at the user test stage to determine the effectiveness of the module as a learning medium in early childhood dance courses. Therefore, given the many tangible benefits of using AR systems in educational settings, stakeholders have a great opportunity to develop all learners (Garzón et al., 2019).

The results of the media expert test viewed from the design dimensions are 75% of the total fullness of 100%, which means that from this dimension, it is said to be feasible. The language dimension used in the module is 100% of the total fullness of 100%, which means that from this dimension, the module is said to be feasible. Based on expert tests in terms of media presented, the early childhood dance choreography module is feasible to be tested at the user test stage to determine the effectiveness of the module as a learning medium in early childhood dance courses. AR should be included in higher education to provide the conditions for learning in an interactive virtual environment and achieve a high level of visualization through the tools preferred by digital learners today. Opportunities are for easier and more accessible learning of the subject matter, to acquire more knowledge in a short period, develop the creative thinking of learners, and generally, its application can lead to an improvement in the quality of education (Cabero-Almenara et al., 2019; Videnov et al., 2018).

The Early Childhood Dance Choreography Module, which has been validated by experts and declared suitable for use, was then distributed to media users, namely students who are taking the Early Childhood Dance course at the Early Childhood Education Teacher Education Study Program (PGPAUD Study Program). After using the module, students filled out a questionnaire to assess the effectiveness of the practicality element of the module on the user. In this study, the use of modules is only limited to the practicality test stage in terms of modules for their usefulness by users, namely students, and has not yet reached the stage of improving student learning outcomes with the use of these modules. The assessment results on the module practicality elements are presented in Figure 6.
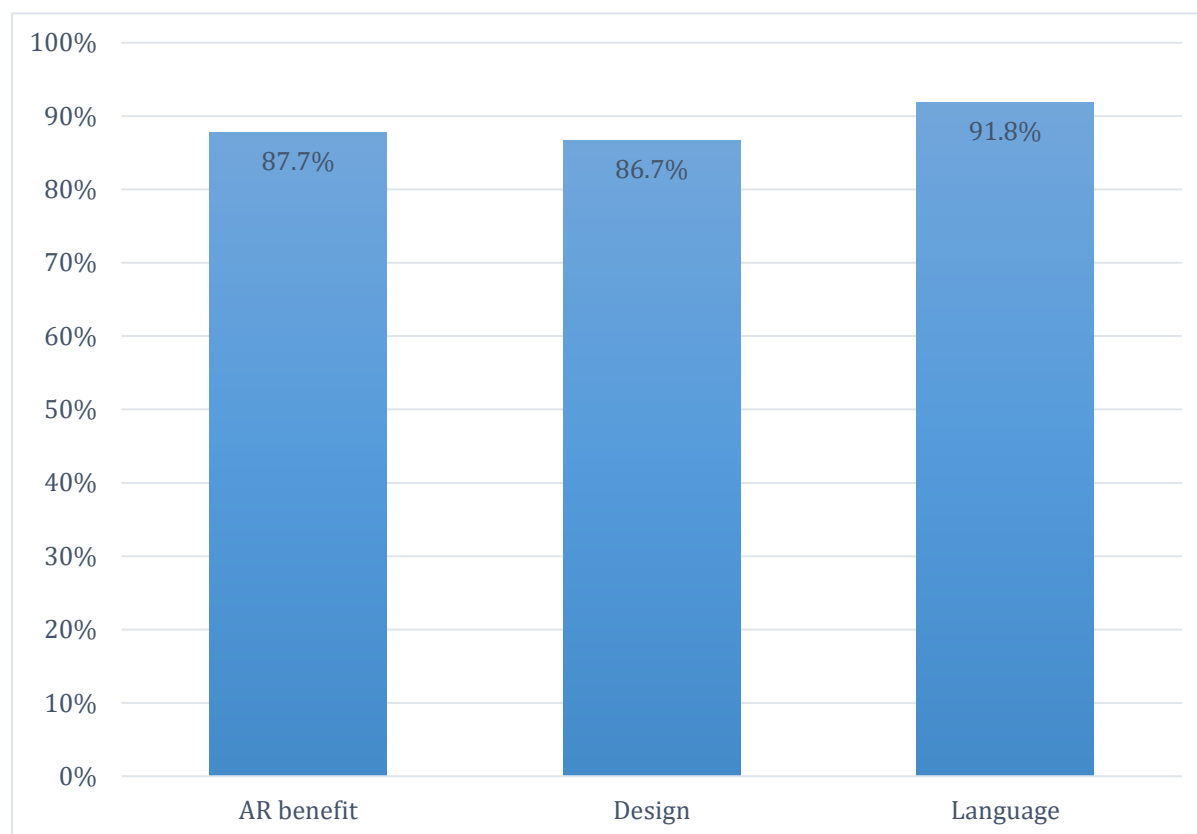
Figure 6. Test results of prospective users (students)

The results of the practicality test in terms of users, namely students, indicated the dimension of media usefulness at 87.75% of the total fullness of 100%, which means that this module has a level of practicality that is in accordance with what students need. The design dimensions are 86.7% of the total 100% fullness which means that this module has a level of practicality in terms of the appropriate design. The language dimension is 91.8% of the overall 100% fullness, which means that this module has the expected level of message delivery.

DISCUSSION

The early childhood dance floor pattern module makes it easier for students to understand various floor patterns that can be used in designing dances specifically for early childhood. The task of educators and researchers now is to find a better connecting point between AR technology and experimental education and to make better use of AR technology in education (Pengcheng et al., 2011).

Early childhood dance floor pattern module design

The resulting module contains images and videos showing various floor patterns that can be applied to early childhood dance choreography. AR often increases student learning activity and allows the development of complex competencies (Molnár et al., 2018). It makes it easier for students to understand the concept of floor patterns instead of just looking at pictures of floor patterns. Pictures and videos are in accordance with the concept of dance for early childhood to provide a breadth of concepts for students in developing early childhood dance.

Students get the experience of seeing the concept of floor patterns and dances that apply floor patterns through visualization with AR technology. From the numerous studies available, the combination in this AR book has created a new synergy and positive effect on learners (Altınpulluk & Kesim, 2016).

Feasibility and practicality of early childhood dance floor pattern module

The use of smartphones owned by students provides practical elements so that students can use their smartphones for the learning process with AR technology in the modules. Smartphones

do not only support learning activities by increasing access to education but also encourage new learning in many ways. AR technology can also improve the function of smartphones in learning (Elmunsyah et al., 2019).

Furthermore, AR can be integrated into educational settings and reviewed for its effectiveness level as teaching material (Sural, 2018). The effectiveness of the early childhood dance floor pattern module contains elements of feasibility that make it easier for students to imagine and think critically in designing early childhood dance choreography. AR often increases student learning activity and at the same time allows the development of complex competencies (Molnár et al., 2018). It is affirmed that the application of AR technology is appropriate for the training of future specialists in the new technological era (Listiani et al., 2019).

CONCLUSION

The developed modules for early childhood dance choreography with AR applications were stated to meet the feasibility elements of the content, presentation, and contextual dimensions of AR, design, and language dimensions. Also, in terms of design and language, the modules provide significant benefits from the user element. This research has not presented data on the results of module implementation in a wider scope from users, namely students. Further research can measure the improvement of student learning outcomes in making early childhood dance choreography by implementing the early childhood dance floor pattern module in the lecture process.

ACKNOWLEDGMENTS

REFERENCES

Adhikari, J., Mathrani, A., & Scogings, C. (2016). Bring your own devices classroom: Exploring the issue of digital divide in the teaching and learning contexts. *Interactive Technology and Smart Education*, *13*(4), 323–343. https://doi.org/10.1108/ITSE-04-2016-0007

Altınpulluk, H., & Kesim, M. (2016). The classification of augmented reality books: A literature review. *INTED2016 Proceedings*, 4110–4118. https://doi.org/10.21125/inted.2016.0200

Arikunto, S. (2006). Metodelogi penelitian. *Yogyakarta: Bina Aksara*.

Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer Science & Business Media. https://doi.org/10.1007/978-0-387-09506-6

Cabero-Almenara, J., Fernández-Batanero, J. M., & Barroso-Osuna, J. (2019). Adoption of augmented reality technology by university students. *Heliyon*, *5*(5), 1–9. https://doi.org/10.1016/j.heliyon.2019.e01597

Chen, Y., Wang, Q., Chen, H., Song, X., Tang, H., & Tian, M. (2019). An overview of augmented reality technology. *Journal of Physics: Conference Series*, *1237*(2), 022082. https://doi.org/10.1088/1742-6596/1237/2/022082

Daryanti, F. (2019). Digitalisasi tari tradisi: Strategi Untuk menghadapi Tantangan Abad 21. *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS)*, *2*(1), 182–189.

Elmunsyah, H., Hidayat, W. N., & Asfani, K. (2019). Interactive learning media innovation: utilization of augmented reality and pop-up book to improve user's learning autonomy. *Journal of Physics: Conference Series*, *1193*(1), 012031. https://doi.org/10.1088/1742-6596/1193/1/012031

Garzón, J., Pavón, J., & Baldiris, S. (2019). Systematic review and meta-analysis of augmented reality in educational settings. *Virtual Reality*, *23*(4), 447–459. https://doi.org/10.1007/s10055-019-00379-9

Hadi, Y. S. (2012). *Koreografi: Bentuk-Teknik-Isi*. Dwi-Quantum.

Herdiani, E. (2020). Seni dan teknologi: tantangan dan peluang dalam dunia tari. *Prosiding: Seni, Teknologi Dan Masyarakat*, *3*, 1–4. https://doi.org/10.33153/semhas.v3i0.130

Hsiao, K.-F., Chen, N.-S., & Huang, S.-Y. (2012). Learning while exercising for science education in augmented reality among adolescents. *Interactive Learning Environments*, *20*(4), 331–349. https://doi.org/10.1080/10494820.2010.486682

Kelly, D., Hoang, T. N., Reinoso, M., Joukhadar, Z., Clements, T., & Vetere, F. (2018). Augmented reality learning environment for physiotherapy education. *Physical Therapy Reviews*, *23*(1), 21–28. https://doi.org/10.1080/10833196.2018.1447256

Listiani, W., Rustiyanti, S., Sari, F. D., & Peradantha, I. B. G. S. (2019). Augmented Reality PASUA PA sebagai Alternatif Media Pembelajaran Seni Pertunjukan 4.0. *Panggung*, *29*(3), 269–283. https://doi.org/10.26742/panggung.v29i3.1012

Molnár, G., Szűts, Z., & Biró, K. (2018). Use of augmented reality in learning. *Acta Polytechnica Hungarica*, *15*(5), 209–222. https://doi.org/10.12700/APH.15.5.2018.5.12

Mustika, M., Rampengan, C. G., Sanjaya, R., & Sofyan, S. (2015). Implementasi augmented reality sebagai media pembelajaran interaktif. *Creative Information Technology Journal*, *2*(4), 277–291. https://doi.org/10.24076/citec.2015v2i4.55

Pengcheng, F., Mingquan, Z., & Xuesong, W. (2011). The significance and effectiveness of Augmented Reality in experimental education. *2011 International Conference on E-Business and E-Government (ICEE)*, 1–4. https://doi.org/10.1109/ICEBEG.2011.5881654

Permana, A. H., Muliyati, D., Bakri, F., Dewi, B. P., & Ambarwulan, D. (2019). The development of an electricity book based on augmented reality technologies. *Journal of Physics: Conference Series*, *1157*, 032027. https://doi.org/10.1088/1742-6596/1157/3/032027

Pradana, R. A., Sulton, S., & Husna, A. (2020). Pengembangan e-modul berbasis mobile learning seni budaya materi konsep budaya, seni, dan keindahan untuk siswa Kelas X SMKN 1 Turen Malang. *JINOTEP (Jurnal Inovasi Dan Teknologi Pembelajaran): Kajian Dan Riset Dalam Teknologi Pendidikan*, *6*(2), 89–96. https://doi.org/10.17977/um031v6i22020p089

Rasalingam, R.-R., Muniandy, B., & Rasalingam, R. R. (2014). Exploring the application of augmented reality technology in early childhood classroom in Malaysia. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *4*(5), 33–40. https://doi.org/10.9790/7388-04543340

Sirakaya, M., & Alsancak Sirakaya, D. (2018). Trends in educational augmented reality studies: a systematic review. *Malaysian Online Journal of Educational Technology*, *6*(2), 60–74. https://doi.org/10.17220/mojet.2018.02.005

Sırakaya, M., & Alsancak Sırakaya, D. (2020). Augmented reality in STEM education: A systematic review. *Interactive Learning Environments*, 1–14. https://doi.org/10.1080/10494820.2020.1722713

Sural, I. (2018). Augmented reality experience: Initial perceptions of higher education students. *International Journal of Instruction*, *11*(4), 565–576.

Sutarno, H. (2012). Konsep dasar bagi seorang penari. *Greget: Jurnal Pengetahuan Dan Penciptaan Tari*, *11*(1), 28–35.

Videnov, K., Stoykova, V., & Kazlacheva, Z. (2018). Application of augmented reality in higher education. *ARTTE Applied Researches in Technics, Technologies and Education*, *6*(1), 1–9. https://doi.org/10.15547/artte.2018.01.001

Wulandari, R. T., Aisyah, E. N., & Untariana, A. F. (2020). the efforts to strengthen nationalist character values through the methods of story telling and dancing. *2nd Early Childhood and Primary Childhood Education (ECPE 2020)*, 144–148. https://doi.org/10.2991/assehr.k.201112.027