



Development of Javanese Gamelan Learning Media for Elementary School Students in Egypt Using the MNI-Javanese Gamelan Android Application

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Abstract

This study aims to: (1) To determine the development of Javanese gamelan learning media for elementary school students in Egypt using the Arabic MNI-Javanese gamelan Android application (2) To determine the feasibility of the MNI-Javanese gamelan android application product in Javanese gamelan learning for elementary school students in Egypt. This research is development research (R&D) with the ADDIE development model. The subject of this study is Grade 6 students totaling 22 students. The data used in the study are quantitative data and qualitative data. The data collection technique and instruments used a list of needs analysis questions, validation questionnaires, student response questionnaires, teacher response questionnaires, and documentation. Data analysis techniques using qualitative descriptive analysis and quantitative data analysis. The results of this research are application products in the form of MNI-Gamelan Java applications, teacher books, student books for grade 6 students in Sudanese African Asia school (SAAS). (2) The results of the assessment of Javanese gamelan learning media products using the MNI-Javanese gamelan android application from media experts, material experts, and users (students) obtained the following scores: media experts in application design visualization (93.84%) in the Very Good category, media experts in book illustration visualization (90.9%) in the Very Good category, material experts (74.5%) in the Good category, small-scale trials of teacher responses (85.33%) in the Very Good category, Small-scale trials with student responses (95.55%) in the Very Good category, large-scale trials with teacher responses (88.84%) in the Very Good category, large-scale trials with student responses with a percentage (97.64%) in the Very Good category.

Keywords: *Learning; Javanese Gamelan; MNI-Javanese Gamelan Application*

Introduction

The Arab Republic of Egypt adopted a strategy of multicultural education and global citizenship through the 2014 decree of the Prime Minister of Egypt. Therefore, the focus is on Javanese gamelan music which is a world heritage, thus making it part of the multicultural educational curriculum in the Egypt educational curriculum for music education subjects at the elementary school stage because it is a

basic stage of education to instill educational and cultural values, which is the basic factor in the formation of the personality of the younger generation, which is the future of the Egypt nation.

Indonesia is a country that is rich in its culture and art, a culture that has been formed by the Indonesian people and has become a world identity and heritage, needs to be preserved so that it continues to exist despite the development of contemporary technology and artificial intelligence. One of the cultures whose existence is threatened by changes in technological developments is the art of traditional music (Triaji, 2021). One example of the many types of music in the archipelago is Gamelan music, this music was born and developed in the Java area. The term Gamelan refers to the type of musical instrument, which is a whole that is realized and sounded together (Iswantoro, 2018).

Gamelan has a high aesthetic appeal and is a symbol of Indonesia's cultural wealth. In addition, gamelan, as a traditional Indonesia musical instrument that is rich in cultural values, offers a unique experience in introducing and understanding Indonesia culture (Ramdhan & Ramliyana, 2023). On December 15, 2021, UNESCO has designated gamelan as a world intangible heritage. Gamelan culture is not only developing on a regional and national scale, but also growing and developing in the global realm. This can be seen from the 2018 International Gamelan Festival which was attended by a number of groups from various countries such as the United States, Malaysia, the Netherlands, Thailand, Singapore, Ireland, Australia, Japan to Hungary (Anggraeni et al., 2023).

Philosophically, Javanese gamelan is an inseparable part of the life of the Javanese people. This is because the philosophy of life of the Javanese people is related to its cultural arts in the form of Javanese gamelan and is closely related to the development of its religion, a means of learning moral values and religious rituals (Arif et al., 2022). Javanese gamelan is a group of five-tone musical instruments that are played as a dance accompaniment, accompaniment to performing arts, and can also be played in their own musical performances (Sumantri & Sari, 2022).

Gamelan is usually played as a performance such as Wayan Kulit, Wayang Kulit and Ketoprak and others. In Javanese society, gamelan music orchestras are usually called "Karawitan" which means complicated, smooth, and small. Javanese art is still displayed at various official events such as weddings, thanksgiving, and many more (Widianti & Wardani, 2022). However, over time, the art was displaced by the rapid changes of the times, such as the influence of western culture that brought changes in music.

Javanese culture is very important to be preserved. This art is part of the global cultural heritage and we must ensure that this art is not lost because it brings human and moral values that can be instilled in the new generation of Arabs. Therefore, something new must be created so that the young generation of Arabs does not forget the global human cultural heritage. One way is to use the MNI-Gamelan Java Android application. With the ease of use of this application and its practicality, the author will teach the basics of Javanese gamelan science in the Middle East using this application, which can be used on smartphones and tablet computers and is aimed at elementary school students and the new generation in Egypt and Arab speaking countries. This is done through the teaching of Javanese gamelan music, and is an extension of the historical bridge between the Republic of Indonesia and the Arab Republic of Egypt.

Given the globalization, multicultural education, global citizenship and great technological advancements that the world is witnessing in all fields, especially in the areas of knowledge, education and learning, after the existence of the internet, the world has become a small village. The impact of modern technology on educational models, teaching strategies and educational learning objectives within educational institutions such as schools and beyond through face-to-face learning or distance learning because we see learning using modern technology is easier and more convenient than before. It has become more attractive to students because the use of technology has become an integral part of human life.

Egypt is one of the countries that has started to include partnerships with the private sector in its strategic planning as an adopted tool to develop and improve the education system. Recently, the Egypt government's policies, especially in the field of education, have undergone many changes. These changes are driven by internal factors, especially the urgent need for reform and development (Helmy et al., 2020).

In 2018, Egypt's Ministry of Education and Technical Education (MoETE) launched a series of reforms to align with the recently developed Strategic Vision 2030 for social and economic change, with the 7th pillar devoted to education and training, which consistently faces a variety of challenges related to rapidly increasing student populations, declining teaching quality, rigid curricula, inequality, uncertainty of political will for change, and lack of resources (Reimers et al., 2022).

Egypt has also adopted a curriculum that supports multicultural education and global citizenship through art, especially music education, making the new generation more open and receptive to the world. Music and culture for the new generation. As a result of the historical and cultural friction between Egypt and Indonesia, and because Egypt was the first country to recognize Indonesia's independence, Indonesia became the focus of Egypt's greater attention to Indonesia's culture and art, and as a result of Egypt's presence. An Indonesian student, the largest student community in Egypt, and direct contact of the Egyptian people with Indonesia culture, which also strengthened the interest of the Egyptian people, he is now studying Indonesian, Indonesian culture and art, but the skills and facilities are still not enough to focus on Indonesia art, especially Javanese Gamelan music which is considered the first means of spreading Islam and becoming a link between Indonesia and Middle Eastern countries.

In this study, efforts are being made to incorporate Javanese gamelan art into the music education curriculum that relies on the multicultural education curriculum and global citizenship into the curriculum of special subjects of Egypt music education subjects between preserving the heritage of the past and looking to the future with its roots. This is related to human history, civilization and culture, through the Indonesia Symphony Orchestra which teaches Javanese gamelan music to Egypt students in elementary schools and Arab countries through the use of an Android application MNI-the first Javanese gamelan for Javanese gamelan music taught in the local language (Arabic) to students of the Arab Republic of Egypt and Arab countries.

Multimedia comes from two words, namely multi and media. Multi means many and media means intermediary, so multimedia is a combination of several elements of text, images, audio, video, and animation that produce a presentation that has interactive communication with its users (Christoffel et al., 2019). Multimedia contains more complete elements, namely text, graphics, audio, video, and animation (Nugraha & Hidayat, 2019). Multimedia is usually recorded, played, displayed or accessed through information content processing devices, such as computers and electronic devices, but can also be part of a live show. Multimedia devices are electronic media devices used to store and enjoy multimedia content.

There are difficulties in providing Javanese gamelan due to the high cost, both brought from Indonesia to Egypt and local manufacturing in Egypt which has lost its original elements because there are no producers in Egypt. Therefore, using an effective educational electronic gamelan application is cheaper and provides an opportunity to train students at any time, individually or collectively, anytime and anywhere, along with the development of technology, which is closely related to daily life and the educational process becomes more dependent on modern technology after the presence of artificial intelligence in particular. The objectives of this study are 1) How to develop Javanese gamelan learning media for elementary school students in Egypt using the Android application MNI- Javanese gamelan in Arabic. 2) What is the feasibility of the MNI-Javanese Gamelan android application product in learning Javanese gamelan for elementary school students in Egypt?

Method

The method used in this study is the Research and Development (R&D) research method because according to (Sugiyono, 2019) with the ADDIE model consisting of five stages, namely Analysis, Design, Development, Implementation and Evaluation. The validation used is the validation of media experts and material experts. The subject of the Product Trial was carried out in a small-scale test of 10 students and a large-scale trial of 22 students in SAAS schools. The data collection technique and instruments used a list of needs analysis questions, validation questionnaires, student response questionnaires, documentation tools, and documentation tools. The data analysis technique uses qualitative descriptive analysis and quantitative data analysis. Calculation of expert validation data and student questionnaire responses using the criteria of the ideal assessment category.

Results And Discussion

The researcher developed an MNI-Gamelan Java android application for elementary school students in Egypt using the ADDIE research model that has been developed by Robert Maribe Branch, with five stages, namely: analysis, design, development, implementation, and evaluation. The main goal of this development model is to design and develop an effective and efficient product.

Planning

This research was preceded by observation at the Sudanese African Asia School (SAAS) interviews regarding the defense carried out in schools. The researcher determines the needs and goals, the needs and objectives include what the student will know or be able to do after completing the learning. Followed by collecting sources, the sources in question such as reference books, original source materials, media and knowledge from others in the field that support the creation of applications for elementary school students in Egypt. Generating ideas, this stage is brainstorming to produce creative ideas in development. Generating ideas for the development of the MNI-Gamelan Java application as a support for gamelan learning. The analysis carried out includes performance analysis and needs analysis. Performance analysis is carried out to find out and classify the problems faced by schools related to the media used during learning.

Design Stage

The design process in the development of Javanese gamelan learning media based on MNI-Javanese Gamelan based on Gamelan material. The Design Method stage uses the Multimedia Development Life Cycle (MDLC). The system design uses the Use Case Diagram Introduction of Javanese Gamelan Musical Instruments, Class Diagram, and Statechart Diagram. The Development stage carried out is based on the Android Application Usage Guide, Student Book Design, and Teacher Book Design.

Implementation

The implementation stage was carried out for teachers at the Sudanese African Asia School (SAAS). During the trial, the researcher made notes about the shortcomings and obstacles that still occurred when the product was implemented, besides that students were also given a response questionnaire regarding the use of the MNI Galeman Java android application.

Evaluation

Evaluation is the process of analyzing the puppet book at the implementation stage, whether there are still shortcomings and weaknesses or not. If there are no more revisions, then the media is worth using.

Product Trial Results

The feasibility of developing Javanese Gamelan learning media for elementary school students in Egypt using the MNI-Javanese Gamelan Android application can be tested by expert assessments and small and large-scale trials, as follows:

1. Development of Learning Media

Based on the ADDIE model, this study was preceded by observations at the Sudanese African Asia School (SAAS) interviews regarding the defense carried out in schools. The researcher determines the needs and goals, the needs and objectives include what the student will know or be able to do after completing the learning. Followed by collecting sources, the sources in question such as reference books, original source materials, media and knowledge from other people in the field that support the creation of applications for elementary school students in Egypt. Generating ideas, this stage is brainstorming to produce creative ideas in development. Generating ideas for the development of the MNI-Gamelan Java application as a support for gamelan learning. The analysis carried out includes performance analysis and needs analysis. Performance analysis is carried out to find out and classify the problems faced by schools related to the media used during learning.

Media limitations cause learning to be less than optimal, students tend to be passive and dependent on the teacher's explanations. This is not in accordance with the independent curriculum where students are required to learn independently and learning centers for students. Based on the results of the planning, media development is important to be implemented. Android, which is one of the means of learning for students at school, is a supporting force to develop Javanese gamelan learning for elementary school students in Egypt through the MNI-Javanese gamelan android application.

The next stage is the design stage, at this stage the researcher carries out processes including pre-production, production, and post-production. The pre-production stage begins with the creation of flowcharts and storyboards. The production stage is the stage of creating media developed with the help of Oreo starting from collecting materials, making layouts, making icons, inserting narratives, descriptions of questions and answers and images used. The post-production stage is carried out finishing, mixing, and rendering of the multimedia products developed.

The next stage is continued with the product development stage. At this stage, media expert validation is carried out. This expert validation aims to find out whether the instrument used is valid and suitable for use or needs to be revised. After the instrument validation process was completed, the Javanese gamelan learning product for elementary school students in Egypt through the MNI-Javanese gamelan android application was tested for feasibility by media experts. The media was revised according to suggestions and inputs from experts until the experts stated that the media was suitable for use. Learning media development products are tested on a small scale first. After that, revisions were made according to the students' responses. That way, the product can be used in large-scale trials and produce learning media products based on the MNI-Javanese gamelan android application.

2. Data Analysis of the Feasibility of Javanese Gamelan Learning Media for Elementary School Students in Egypt Using the MNI-Javanese Gamelan Android Application

The feasibility of the learning media of the MNI-Javanese gamelan android application was obtained from assessments by material experts, media experts, small-scale trials, and large-scale trials which will be explained as follows:

3. Data Analysis Validation Media Visualization Application Design

The data results from the assessment of material experts with aspects of assessing the appearance of the "MNI-Javanese gamelan" android application, the quality of the content of the "mini-Javanese gamelan" android application, and the ease of use of the application. The results of the assessment of media experts on application design visualization got a score of 61 out of a maximum score of 65 with a percentage of 93.84% which stated that the application design visualization media used was in the Very Good (SB) category, then it can be interpreted that the feasibility of Javanese gamelan learning media for elementary school students in Egypt through the MNI-Javanese gamelan android application can be used or in small-scale trials or field trials.

4. Media Expert Assessment Data on Book Illustration Visualization

Data from the assessment of material experts with aspects of the display of student books of the Story of the Miracle of the Archipelago in the Eyes of the Youth of Messiah) and the quality of the content of the Story student book (The Miracle of the Archipelago in the Eyes of the Youth of Egypt). The results of the assessment of media experts on the visualization of book illustrations obtained a score of 50 out of a maximum score of 55 obtained a percentage of 90.9% which stated that the media in the visualization of book illustrations used was included in the Very Good (SB) category, then it can be interpreted that the feasibility of Javanese gamelan learning media for elementary school students in Egypt through the MNI-Javanese gamelan android application can be used or in small-scale trials or field trials.

5. Material Validation Data Analysis

The analysis of material validation data aims to test the validity of the material in accordance with the input of expert validators in the aspects of Material Quality and content. The results of the assessment of the subject matter expert obtained a score of 41 out of a maximum score of 55 with a percentage of 74.5% which stated that the material in the book used was in the Good (B) category, then it can be interpreted that the feasibility of Javanese gamelan learning media for elementary school students in Egypt through the MNI-Javanese gamelan android application can be used or in small-scale trials or field trials.

6. Small-Scale Test Data Analysis Teacher Response

The analysis of small-scale test data of teacher responses totaling 3 people aims to determine the feasibility of the product in accordance with the learning assessment instrument using the MNI-Gamelan Java android application for users with aspects of content eligibility, linguistic aspects, and aspects of teacher guidance. The results of the small-scale trial of the teacher's response received a score of 192 out of a maximum score of 225 with a percentage of 85.33% which stated that the material in the book used was in the Very Good (SB) category, that learning using the MNI-Javanese gamelan android application could be used for large-scale trials. The assessment process by users produced several inputs in the form of 1) this guide is enough for teachers to know the basics of Javanese gamelan art to teach it, 2) turning student books into readable books, 3) new applications of the same kind for teaching music education through Android applications in Indonesia music language.

7. Small-Scale Test Data Analysis Student Response

The results of the small-scale trial student response got a score of 430 out of a maximum score of 450 with a percentage of 95.55% which stated that the material in the book used was included in the Very Good (SB) category, that learning using the MNI-Javanese gamelan android application could be used for large-scale trials.

8. Large-Scale Test Data Analysis Teacher Response

The analysis of large-scale test data totaled 37 people, aiming to determine the feasibility of the product from the aspect of learning media assessment instruments for users with aspects of content eligibility, linguistic aspects, and teacher guidance aspects. The results of the large-scale trial, the student response got a score of 573 out of a maximum score of 645, a percentage of 88.84% which stated that the material in the book used was included in the Very Good (SB) category, that learning using the MNI-Javanese gamelan android application could be used for the final product.

9. Large-Scale Test Data Analysis Student Response

The results of the large-scale trial of student responses received a score of 1074 out of a maximum score of 1100 obtained a percentage of 97.64% which stated that the material in the book used was in the Very Good (SB) category, that learning using the MNI-Javanese gamelan android application could be used for the final product.

Product Revision

1. Revision of Media Experts

The validation process by media experts resulted in several inputs in the form of revisions as follows: "It's good, it would be better if there was an explanation of the rationalization of the technology used".

2. Revision of Material Experts

The validation process by material experts resulted in several inputs in the form of revisions as follows: "Please form a gamelan group. The content is students from Egypt and Indonesia, they can join for joint training. They can interact and learn the practice of playing gamelan. If you can't beat gamelan yet, you can wonder how to beat gamelan. The image of the gamelan instrument and its explanation must be clear.

Final Product Review

The results of the development of Javanese Gamelan learning media for elementary school students in Egypt using the MNI-Javanese Gamelan Android application can be run on an android smartphone with a full screen display. The MNI-Gamelan Java android application with the title The Miracle of the Archipelago in the Eyes of Egypt Youth contains Gamelan material which contains: 1) the opening sentence about the miracle of the world in Indonesia; 2) Indonesia's natural tourism destinations; 3) Gamelan Tools; 4) playing gamelan musical instruments through MNI-Gamelan Java. The subject matter discussed has been adjusted to the level of understanding of students at the Sudanese African Asian School (SAAS), which has previously been discussed with the teacher of cultural arts subjects at the research site.

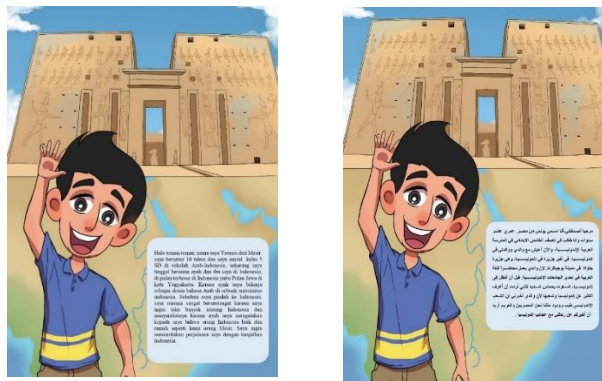
The creation of this Javanese gamelan learning media development product has previously gone through a validation process by material experts and media experts. The results of criticism and suggestions are then used as materials for improving learning media. Media experts and material experts further stated that Javanese gamelan learning media is suitable for research, and then tested in small-scale groups of 3 teachers and 10 students, and large-scale product tests with a total of 9 teachers and 22 students. The results of the trial show that learning Javanese gamelan for elementary school students in Egypt through the MNI-Javanese Gamelan android application is very feasible to be used as a learning medium.

The following is a Javanese gamelan learning product for elementary school students in Egypt through the MNI-Gamelan Java android application from the cover page, opening page, question and answer description page, MNI Galeman Java menu end, musical instrument page display page, and developer profile page which can be seen below:



(a) Indonesian version (b) Arabic version

Figure 1. Final Product Menu Cover Android Application MNI-Gamelan Java



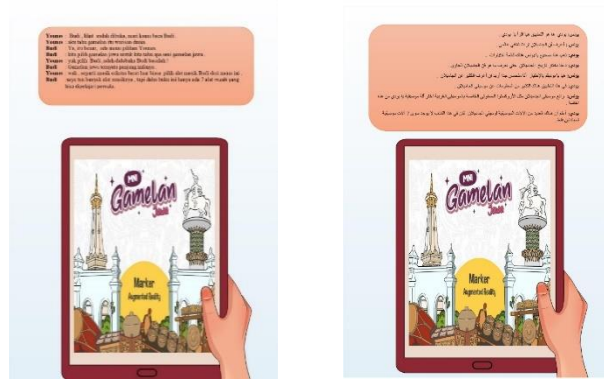
(a) Indonesian version (b) Arabic version

Figure 2. Final Product Opening Menu



(a) Indonesian version (b) Arabic version

Figure 3. Final Product Description FAQ



(a) versi indonesia

(b) versi arab

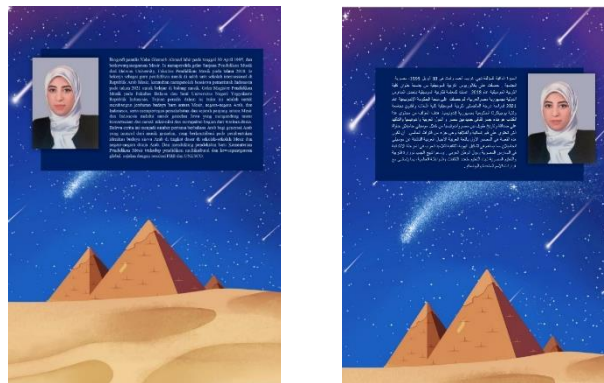
Figure 4. Final Product of MNI Galeman Java Menu



(a) versi indonesia

(b) versi indonesia

Figure 5. Final Products Musical Instrument Page Display



(a) Indonesian version

(b) Arabic version

Figure 6. Developer Profile Page



Figure 7. Home Page on 3D Applications



Figure 8. Language Selection Page



Figure 9. Home Page on 3D Applications



Figure 10. 3D Gamelan Musical Instruments Page



Figure 11. Sound Settings Page



Figure 12. Vendor Name Bio Page



Figure 13. 3D Gamelan Instrument Selection Page



Figure 14. Kenong Musical Instrument 3D Page



Figure 15. Kempul Gong 3D Musical Instrument Page



Figure 16. Bonang Musical Instrument Page 3D Successor



Figure 17. Kendang Musical Instrument 3D Page



Figure 18. Saron 3D Musical Instrument Page

Conclusion

Based on the results of the research obtained by data analysis and hypothesis testing, it can be concluded as follows:

1. The resulting development product is in the form of Javanese gamelan learning media using the MNI-Javanese gamelan android application for students at the Sudanese African Asia School (SAAS) entitled gamelan for grade 6 students.
2. The results of the assessment of Javanese gamelan learning media products using the MNI-Javanese gamelan android application from media experts, material experts, users (teachers and students) obtained the following scores: media experts in application design visualization got a percentage of 93.84% in the Very Good (SB) category, media experts in book illustration visualization got a percentage of 90.9% in the Very Good (SB) category, material experts got a percentage of 74.5% in the Good category (B), The small-scale trial of teacher response obtained a percentage of 85.33% in the Very Good (SB) category, a small-scale trial in which the student response obtained a percentage of 95.55% in the Very Good (SB) category, The large-scale test of teacher response obtained a percentage of 88.84% which stated that the material in the book used was in the Very Good (SB) category, the large-scale test student response obtained a percentage of 97.64% in the Very Good (SB) category. Thus, it can be concluded that the android application

for learning entitled the development of Javanese gamelan learning media using the MNI-Javanese gamelan android application for grade 6 at the Sudanese African Asia School (SAAS) is declared very feasible.

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