

The Development of Edu-games as a Learning Media

Muhammad Rais
 Universitas Negeri Makassar
 Makassar, Indonesia
 m.rais@unm.ac.id

Farida Aryani
 Universitas Negeri Makassar
 Makassar, Indonesia
 farida.aryani@unm.ac.id

Muhammad Riska
 Universitas Negeri Makassar
 Makassar, Indonesia
 muhammadrbabo @unm.ac.id

Abstract—The development of edu-games as a learning media for educational specific purposes should be tailored to the learner needs. These objectives include reducing the child's unfamiliarity, facilitating an active learning environment, arousing curiosity, and enabling scaffolding. The research aims to develop Edu-Games learning media that contains various types of professions. The media games offered are 1) finding the difference, 2) playing the puzzle, 3) recognizing the profession. Edu-games design method using waterfall design developed by Pressman include: 1) system engineering, 2) analysis, 3) design, 4) coding, 5) testing, and 6) maintenance. The resulting product in the form of the edu-games application based on Android. The design results show that the edu-games media of the profession has been quite clear and feasible to be used as a medium of learning the introduction of various types of professions as one of the competencies recognized by early childhood students.

Keywords—*instructional media, edu-games profession, android based, early childhood students*

I. INTRODUCTION

The use of multimedia technology in streamlining learning has become a necessity and increase during the time. Its existence makes the learning atmosphere to be interactive, giving a sense of comfort, avoiding boredom and create a relaxed atmosphere. Furthermore, learning as a process of interaction between teachers, students, and teaching materials requires media that will mediate the flow of information content of the material to be studied. Use of appropriate media that is based on, among others, by the characteristics of students and content of subject matter. The characteristics of early childhood students when learning is to put forward the principle of media usage that facilitates the learning process while playing.

Playing is a fun activity to fulfill the interests of the activity itself. Playing provides an opportunity for children to adapt to the environment and help children master anxiety [1]. By playing, many psychological and personality functions can be developed. This is because in the activity of playing many events involving psychological activity and personality of the participants [2]. By playing, making all aspects of the physical-motor, cognitive, language, emotion, social, imagination, activity, ethics and morals inherent in the self, can be developed as a medium to construct children's growth.

The game that became the favorite of early childhood, which is most likely due to the doctrine of parents so that introduced only a strategic profession that is considered by the parents as a the profession of moneymaking (assuming

parents) without thinking about how much it costs to be incurred as well as what skills should be the provision of a child to become a doctor, policeman, soldier, pilot and navy (favorite profession).

For other types of professions such as chefs, judges, engineers, astronauts, and teachers giving assumption and understanding to the children do not know the career because parents are less introducing many types of professions. This is all due to the lack of information that parents give to children about the duties and functions of the profession. To avoid mistakes in career selection, the career the child will have to be introduced from an early age, so that the children interest in career is no longer just a job, but more than that, a person in choosing and determining career interest is for the satisfaction of his life and to last as long as his life.

Interest is a state of a person has a concern and encourages people to do what they want [3],[4]. The interest is built on the sense of joy and attached to a thing that goes on and on which refreshes a person's attention, thus making himself selective towards his object of interest [5]. The pleasure of the student towards a particular profession, indicating the interest in one's self learn more about the profession he or she is interested in. Knowledge of the various professions in early childhood students shows the level of competence they have. This competence is within the limits of recognizing the profession according to the field of work. The profession is the work done as the principal activity to earn a living and who rely on a skill [6]. The profession can be said as a job that has a certain skill and is based on someone in carrying out its role and existence in the work environment.

The development of educational gaming professions are expected to be made as far as possible in relation to the needs of education made is learning a comfortable language environment and learn about children needs. This educational model can be done to provide learning tools for early childhood children as an effort to facilitate and curiosity in issues and in conversation as individuals who are learning. Introducing early childhood laws against a variety of learning objects using computer technology can help children absorb information. The use of game-based applications has helped students achieve learning content and objectives, learning experiences, learning interests [7],[8]. The media information used to create puzzles in kindergarten students has been able to communicate with them, and they are very precise, easy, and very easy to use as a medium of information for early childhood students.

II. RESEARCH METHOD

This research is design by using development research to produce media learning. Research development using the ADDIE model that aims to produce research products. The resulting product is the manual (guide) of Edu-Games application "My Profession" which can help the early childhood teacher in introducing student career interest that will be published as a reference book for early childhood teachers and the application of Edu-Games "My Profession" based on Android.

This research is carried out in several phases illustrated by the research flow chart (fishbone diagram) which describes what has been done and what will be implemented. In the first year the focus of research on efforts to generate attitudes and responses of early childhood teachers to the needs of professional edu-games applications, prototype product edu-games profession applications, and journal articles.

The procedure of development is described as follows: The first step is to analyze the needs through the study of literature related to the topic of research, research studies relevant to the field studied, then conduct field studies related to the research topic. The second stage is to design the Edu-Games application "My Profession" by using the ADDIE development design [9], from the analysis phase to the evaluation phase. The next stage is the development of products to produce products in the form of application model Edu-Games "My Profession". The next stage is the evaluation of the developed product. Data analysis is emphasized on the description of the results of the analysis of the needs of the development product, validator response, and test results.

At the product development stage, the design is done by adopting a Pressman development model [10] using the waterfall method (Fig. 1).

The waterfall development model adopted from Pressman [10] stages are described as follows:

A. System/Information Engineering and Modeling

This modeling begins with the search for the needs of the whole system to be applied into the form of software. This is very important, considering the software must be able to interact with other elements such as hardware and database. This stage is often called Project Definition.

B. Software Requirements Analysis

The search needs process is intensified and focused on software. To know the nature of the program to be created, then the software engineer must understand the information domain of the software, such as the required functions, user interface, and so forth. Of the two activities (search system and software needs) must be documented and shown to the customer.

C. Design

This process is used to transform the above needs into a representation into the "blueprint" form of software before coding begins. The design should be able to implement the requirements already mentioned in the previous stage. Like 2 previous activities, then this process should also be documented as a configuration of the software.

D. Coding

To be understood by the machine, in this case, is the computer, then the design had to be transformed into a form that can be understood by the machine, that is into the programming language through the process of coding. This stage is an implementation of the design stage that technically will be done by the programmer.

E. Testing/Verification

Something made must be tested. Likewise with software. All software functions must be tested so that the software is free from errors, and the results should be perfectly in accordance with the needs that have been defined previously.

F. Maintenance

The necessary maintenance of the software, including the development, because the software created is not always like that. At runtime, there may still be a minor error not found before, or there are additional features that are not in the software. Development is required when there are changes from external companies such as when there are changes to the operating system or other devices.

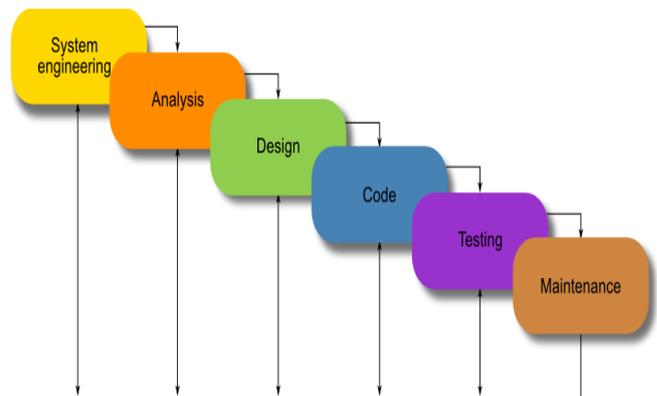


Fig. 1. Android Edu Games Professional Application Development Model

III. RESULT AND DISCUSSION

A. Result

The result of the media design Profession Edu-Games consists of three parts, namely: 1) find the difference, 2) play the puzzle, and 3) recognize the profession.

1) Looking For Differences

Competence: Early childhood students have the ability to identify different types of professional differences based on the characteristics or attribute characteristics that each profession has. The profession featured on the model consists of four types of professional games namely, the police profession, farmers, journalists, and ustadz. This menu is a menu featuring game edu games that search for various professions (look for differences). By clicking start, will appear four types of professions to be played by:

Each profession has four different types:

- If a difference is found, it will move to the next profession type

- If the difference is not found or wrong, then the game is finished and will return to the home menu, so the menu will display "you lose."
- Each match finds the difference in the profession; time is determined up to 5 minutes
- Any game of the profession looking for difference will be guided by using voice prompts, such as "uh, try again yah," if it's wrong, and if it's true, it will say "you're smart," it's meant to give reinforcement.
- Any discrepancies found will be displayed with a green circle, and if there is a red cross icon displayed.
- Each victory of one type of professional game will be rated 400.



Fig. 2. Differences in Edu Games Profession Games

2) *Playing puzzle*

Competence: Early childhood students have the ability to recognize different types of professions through puzzle games. The early childhood students can generate interest and motivation to know the various types of professions.

In the puzzle game, there are four menus when clicking on one of the types of profession gallery, Next menu, Gallery, Settings, and Exit. The Next Menu is a command to move directly to one of the following professions, for example from the agricultural profession to the police profession. The Gallery menu is a menu to display all types of professions published in professional gaming education. The setting menu to set difficulty level puzzle consisting of easy (low), moderate (medium), and difficult (high). Also in the settings menu, there is a choice of sound settings when the puzzle game is played. If checked, the music sounds, and if it is not checked, the music will die. The last menu is the Exit menu if you want to go straight from the game Edu. If you click Exit, then the menu will move to the original menu.

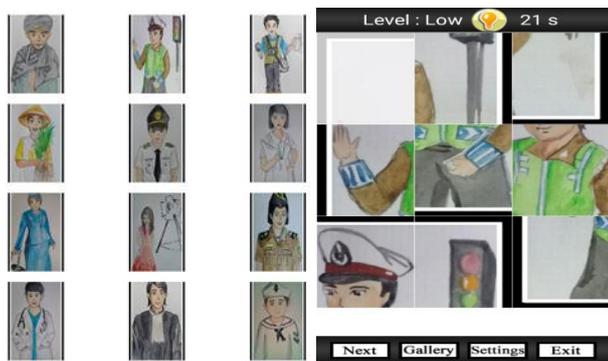


Fig. 3. Edu Games Playing Puzzle Profession

3) *Recognizing Profession*

Competence: Early childhood. This game is very easy, simply by clicking the image of his profession, it will be displayed in the game with a voice that provides clarification of the meaning of the profession in question. For example, when picture 4 is a journalist and a pilot profession, there will be a voice saying "journalists are people who work covering and publishing news in print and electronic media" and "pilots are people with aviation knowledge and good at flying airplanes."



Fig. 4. Edu Games Knowing Profession

B. *Discussion*

The edu-based android app is a gaming app that recognizes different types of professions/jobs by using Android. The android is a technology system that uses smartphone features as a desired, controlled, and manipulated medium for a particular purpose. Through the Linux base, this application facilitates game developers in maximizing the intent and purpose of each product to be developed. Playing with android with the theme of profession/job is quite exciting. Through game themes such as finding the difference between two images, assembling images and sound manipulation, will encourage students' curiosity. Thus this application can provide value in an effort to introduce different types of professions/jobs by utilizing smartphones.

The interest of teachers and students to the learning media Edu-Games. The game of My Profession became the basic reference in developing the Edu-Games Profession application. The basis is that as an educational game, this app gives a pleasingly positive impression to teachers and students, providing a challenging and exciting ambiance framed by the elements of the game in it. Educational type games have the potential to encourage children's learning motivation and encourage children's learning interest in the subject matter while playing, so it is expected that children can more easily understand the subject matter presented [11].

The finding that early childhood teachers are interested in using edu media games that contain fun game elements is supported by research that found that puzzle-based career-based information media is highly appropriate, useful, and very interesting to use as a career information medium for kindergarten students [12]. Kindergarten teachers provide a positive response that teaches any concept to students if using media that meets the elements of the game application via mobile phone or TAB and or the computer further encourages the students to know the game they play. Therefore, in this research, it is expected that teacher's role is to continue to help the students to provide understanding

related to the concept of the material learned so that students have a strong and meaningful knowledge in mind.

The development of the game as expected for educational purposes is as much as possible tailored to the individual needs of learners, reduces child propensity, facilitates an active learning environment of curiosity, and allows for learning of scaffolding [13]. This explanation underscores the need to provide learning tools for early childhood children as an effort to facilitate interest and interest in identifying concepts and within the framework of child growth as a learning individual.

The use of educational games as a medium of learning has been widely applied as a medium in helping educators convey material and meet the learning objectives to be achieved. The results show that the use of application-based games has helped learners to achieve content and learning objectives [7]. Similar research was conducted on elementary school students; the results showed that online games developed in the form of competitive board games for web-based troubleshooting activities have been significantly able to accommodate learning attitudes, interest in learning and acceptance of student technology as part of learning achievement [8]. The research support presented above confirms that the development of educational games is an opportunity to provide learning services that are sensitive to the use of information technology in learning. Although the media using computer-based learning media is not the only cause of students becoming interested and interested in learning something, the presence of learning media that utilizes the game elements to be a positive supplement in placing the media as mediated learning (media learning).

The development of educational games must still consider aspects of the student's cognition level. Games that are too difficult and provide less entertaining game elements for early childhood students tend to be less attractive to students. Therefore, the game should consider the level of character of participants who will use the game. For the design of educational games, the challenge of the game must be able to follow the ability and learning of students to continue to be studied [14]. The curiosity effect continues to challenge students' minds not to stop exploring the games played to victory. Each victory gives the students a sense of satisfaction that they have won the game. The meaning of winning games in edu shows that students have understood the meaning of every profession he won. Opportunities for teachers in the educational games profession are designed to explain the meaning of the professional game won. Each explanation given by the teacher gives the mind reinforcement to the mind of the students and easily understand and synchronize every game theme with the theme of knowledge competence to be learned.

The meaning of the edu game is not just as a game to satisfy the student's entertainment wishes, but the game provides additional knowledge effects in the form of an understanding of game content that explores the concept of a professional field or works through play. This is the meaning

of playing while learning (playing with learning) and learning while doing (learning by doing).

IV. CONCLUSION

Based on the results of the above research can be concluded that has been obtained the development of learning media design Edu Games Profession that can be used by early childhood teachers as one of the interactive learning media. Teachers are generally interested in using instructional media that use ICT applications and generally express their desire to use Edu Games media that meet the elements of attraction, challenge, and facilitate curiosity and encourage the creation of a pleasant learning environment. Therefore, the results of this study further suggest that the design of learning media products Edu Games Profession can be used as one of the media learning professions that will help early childhood students in knowing the profession.

REFERENCES

- [1] J. W. Santrock, *Life-span development*. Brown & Benchmark Publishers, 1997.
- [2] H. Tüzün, M. Yılmaz-Soylu, T. Karakuş, Y. İnal, and G. Kızılkaya, "The effects of computer games on primary school students' achievement and motivation in geography learning," *Comput. Educ.*, vol. 52, no. 1, pp. 68–77, 2009.
- [3] D. Coon and J. O. Mitterer, *Introduction to psychology: Gateways to mind and behavior with concept maps and reviews*. Cengage Learning, 2012.
- [4] E. B. Hurlock, "Developmental psychology (an approach throughout the life span)," *Transl. Dev. Psychol. Jakarta Erlangga*, 1980.
- [5] J. P. Chaplin, "Complete Dictionary of Psychology." Jakarta: Rajawali Press, 1989.
- [6] R. S. Naagarazan, *A textbook on professional ethics and human values*. New Age International, 2007.
- [7] L. C. Almeida, "The effect of an educational computer game for the achievement of factual and simple conceptual knowledge acquisition," *Educ. Res. Int.*, vol. 2012, 2012.
- [8] G.-J. Hwang, P.-H. Wu, and C.-C. Chen, "An online game approach for improving students' learning performance in web-based problem-solving activities," *Comput. Educ.*, vol. 59, no. 4, pp. 1246–1256, 2012.
- [9] M. Molenda, "In search of the elusive ADDIE model," *Perform. Improv.*, vol. 42, no. 5, pp. 34–36, 2003.
- [10] R. S. Pressman, "'Software Engineering—A Practitioner's Approach', Mc Graw-Hill International Edition, 2010." BHARATHIDASAN ENGINEERING COLLEGE, 2015.
- [11] T. Hainey, T. M. Connolly, E. A. Boyle, A. Wilson, and A. Razak, "A systematic literature review of games-based learning empirical evidence in primary education," *Comput. Educ.*, vol. 102, pp. 202–223, 2016.
- [12] C.-H. Lin and C.-M. Chen, "Developing spatial visualization and mental rotation with a digital puzzle game at primary school level," *Comput. Human Behav.*, vol. 57, pp. 23–30, 2016.
- [13] J. Foreman, "Game-based learning: How to delight and instruct in the 21st century," *Educ. Rev.*, vol. 39, no. 5, 2004.
- [14] J. Hamari, D. J. Shernoff, E. Rowe, B. Collier, J. Asbell-Clarke, and T. Edwards, "Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning," *Comput. Human Behav.*, vol. 54, pp. 170–179, 2016.