

Med-Pharm Games Application as Learning Media for Department of Pharmacy Students

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Abstract

This study aims to produce game-based science learning media, namely Med-Pharm Games for use in learning for Diploma Students Department of Pharmacy. Med-Pharm Games is a knowledge game about the names and uses of drugs, especially in the field of Pharmacy. This game is able to sharpen the brain by finding the appropriate answer based on the statement. This research is a type of development research (research and development). The development model used in this research is ADDIE which consists of (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. This research was conducted to produce the Med-Pharm Games application and the Med-Pharm Games application was validated by media experts and material experts. The data analysis technique used was a questionnaire instrument and descriptive analysis techniques. This games application is easy to use (user friendly) for Android smartphones or laptops or PCs (Windows). Based on media expert validation and material on the feasibility of Android-based learning media, namely Med-Pharm Games with an ideal percentage of 90.90% which is included in the feasible category with a very good predicate.

Keywords : ADDIE, Game based Science Learning, Med-Pharm Games

Background

In this digital era, consciously or unconsciously, everyone is connected and dependent on the world of technology. Technology also influences the world of education so that the current generation is expected to take part in the digital era. Education must also have an important role in developing the quality of human resources. It is hoped that educational units will not only focus on carrying out teaching and learning processes using print media, but will be more creative/innovative and dynamic. So that students not only hear, see, but must practice it in everyday life. Digital skills and literacy as a form of transformation in the field of education are really needed in the 21st century to improve the quality and competence of students and lecturers (Sari, 2021). The young generation born in the 21st century is the digital generation or Internet generation (Bennett, et al., 2008). The trend of using digital games is increasing in this era (Corbett, 2010; McGonigal, 2011). Millions of people have been immersed in playing digital games for both entertainment and education (Huang, Hew, & Lo, 2019) and it was reported in their study that around 90% of students' phones are connected to digital games.

Apart from that, many teachers use digital games as a teaching medium in the classroom to involve students during the teaching and learning process, or what is usually called Digital Game-Based Learning (DGBL). Learning media is one of the supports in the learning process so that the process is successful or not learning is largely determined by the media used (Atsani, 2020). Students also get feedback such as improvements and wins after completing games. Digital Game-Based Learning which specifically focuses on Science is called Game-Based Science Learning (GBSL). Apart from preventing boredom, learning activities using game media will leave a long-lasting impression in students' memories and provide opportunities for students to study in a more enjoyable atmosphere without abandoning learning objectives (Noviarni, et al., 2012).

Independent game-based learning resources can not only be used as learning aids but can also be used by students with or without lecturers (Sari, et al., 2013). In the context of science, Li and Tsai (2013), reviewed research articles on game-based science learning (GBSL) published from 2000 to 2011. The focus of the review was qualitative results including research objectives and design, theoretical foundations, game design, and learning focus. Based on this review, GBSL can provide effective learning in a collaborative problem solving environment.

From the explanation above the Med-Pharm Games application, namely finding the right answers regarding the names of drugs and their uses, is expected to make Diploma students majoring in Pharmacy more interested in understanding, studying and memorizing the names of drugs and their uses. Med-Pharm Games is a word guessing game that involves finding the right answer regarding the names of medicines and their uses. This game can sharpen the brain by looking for groups of letters that contain meaning. Guess the word is a question in the form of a sentence, a question in the form of a story or picture and so on which is a brain teaser aimed at finding something (Subarna and Sunarti, 2012). Based on research by Alifiar et al (2020), board games can improve the understanding and motivation of pharmacy students in studying metabolic pathways because educational games can help complement and strengthen the material taught. Based on research by Bagus et al (2023), the use of an Android-based Interactive Quiz Learning Application for Pharmaceutical Sciences for pharmacy students can be useful for teachers and students in vocational schools majoring in Pharmaceutical Sciences. So based on the understanding above, it can be concluded that the guessing or word search game application developed into the Med-Pharm Games application is expected to be an educational game for searching or finding the right answers regarding the names of medicines and their uses which can be used by students as a games-based learning medium. so that it can increase student motivation and interest in learning.

This research aims to design and create Game-Based Science Learning media using the Research and Development method with the ADDIE model which is then validated or assessed by media experts and material experts so that the quality of the learning media, namely the Med-Pharm Games application created, can be known. The aim of this research is to produce game-based learning media and the characteristics of the Med-Pharm Games application as a learning media for Diploma students majoring in Pharmacy. The creation and design of the Med-Pharm Games application provides practical benefits, including increasing student learning motivation, helping to improve learning understanding by presenting material in an interesting way and making it easier to interpret material that is considered difficult. And as an alternative science learning media that is more innovative and creative.

Research Method

This research uses the Research and Development method, namely the process used to develop and validate educational products (Borg and Gall, 1989) and test the effectiveness of these products. The development model that researchers use in this research is the ADDIE model developed by William Lee (2004) explaining that in the ADDIE development model there are several stages, namely analysis, design, development, implementation and evaluation. The hope is that after an analysis is carried out, the product being developed can be put to use by consumers or the subjects of the product. In this research, a product will be produced in the form of an Android Games Application "Med-Pharm Games" as a games-based learning media application so that students can find the right answers regarding the names of drugs and their uses.

Participants are subjects who are involved in physical activities as participants in providing responses to activities carried out in the teaching and learning process and supporting the achievement of learning objectives. In this research, the researcher involved several participants or research subjects, namely: media and material expert validators. The object of research using the Research and Development method is the quality of the Android Games Application product "Med-Pharm Games" as a game-based science learning media, namely guessing or searching for words by finding the right answer regarding the names of drugs and their uses.

The instrument used in this research is an instrument in the form of a questionnaire for media experts and material for the Med-Pharm Application. Research instruments for media and materials experts are used to determine the level of appropriateness and quality of media and materials created by researchers. This instrument was given to two media and material experts, namely lecturers at the Pharmacy Department.

This research instrument was prepared based on the LORI dimensions. There are several aspects that make up instruments for media and material experts, namely learning objectives, content quality, and feedback and motivation.

The data collection procedure used in this research is product validity data. The data obtained in this research are quantitative data and qualitative data. Quantitative data was obtained from the results of evaluation questionnaires from material experts and media experts. This data uses a Likert Scale with response information, namely a score of 5 if the predicate is very good, a score of 4 if the predicate is good, a score of 3 if the predicate is sufficient, a score of 2 if the predicate is poor, and a score of 1 if the predicate is very poor. After obtaining data originating from the research results, then descriptive data analysis was carried out. Data in the form of a questionnaire needs to be calculated so that it can be presented in the form of qualitative data.

Result and Discussion

This research uses the Research and Development method, namely research used to produce certain products and test the effectiveness of these products. The product developed in this research is learning media in the form of an Android-based Med-Pharm Games application that discusses material regarding the names and uses of drugs, especially in the field of Pharmacy. The results of this research use the ADDIE model, namely; (1) At this stage, content and software requirements analysis activities were carried out by observing level 1 students majoring in pharmacy for one month. To analyze content requirements, an analysis of the syllabus and RPS for students majoring in pharmacy was carried out. Software analysis aims to analyze the functional requirements of the system, namely the learning game application. Analysis of the problems and characteristics of Pharmacy Department Diploma students regarding problems in the material on drug names and uses. Technology analysis shows that all students have Android cellphones. Material analysis is carried out based on the curriculum implemented based on competencies and learning achievement indicators. Using Android-based games as learning media can support innovative learning processes. Android-based games as a learning medium are expected to be able to make a concept more interesting so as to increase student learning motivation. (2) Material design for the names and uses of drugs in the pharmaceutical sector based on their types as well as creating game designs using Android-based game software. (3) Development by creating an Android-based Med-Pharm Games application with material on the names and uses of drugs in the pharmaceutical field. Prepare your laptop and open the website for the Android-based game application creation platform, namely QuickAppNinja. Enter the application by logging in via email then selecting a game in the form of searching for words, and inputting the name of the game application created, namely "Med-Pharm Games", which is a game for searching for names and uses of medicine. Arrange several levels by including pictures and questions regarding the name and use of drugs. The Med-Pharm Games application has been generated and the application can be downloaded via email link. (4) Implementation was carried out by validation of the Android-based Med-Pharm Games by Media and Materials Experts, namely diploma lecturers in the pharmacy department. Validate media and material experts to provide grades, comments and suggestions regarding the suitability of Android-based Med-Pharm Games as learning media. (5) Evaluation is used to provide feedback to product users. The formative evaluation stage was carried out in a review test after revisions were made to the Android-based Med-Pharm Games application.

Product development was made using QuickAppNinja as an Android-based game application creation platform. The title of this game is “Med-Pharm Games”, which is a word guessing game that contains questions about the names and uses of drugs in the pharmaceutical field which can be seen in Image 1.



Image 1. (Med-Pharm Games Application)

In this game there is an introductory part of the game which consists of the main menu options, namely play, about, sound, levels and social media. To complete this game, it is in the form of a template or has been designed and cannot be changed or added to. This games application is easy to use (user friendly) for Android smartphones. Students who use a laptop or PC (Windows) can also use these games by downloading additional software, namely NOX. This games application also does not use cellular data after being downloaded so students do not use up their internet quota so this game is easy to apply. Android-based learning media, namely the Med-Pharm Games application, can increase student learning motivation, be more attractive and use the application repeatedly. The Med-Pharm Games application has 21 levels that have been created and can be added further to be grouped based on the type and class of pharmaceutical preparations. The levels in the Med-Pharm Games application can be seen in Image 2.

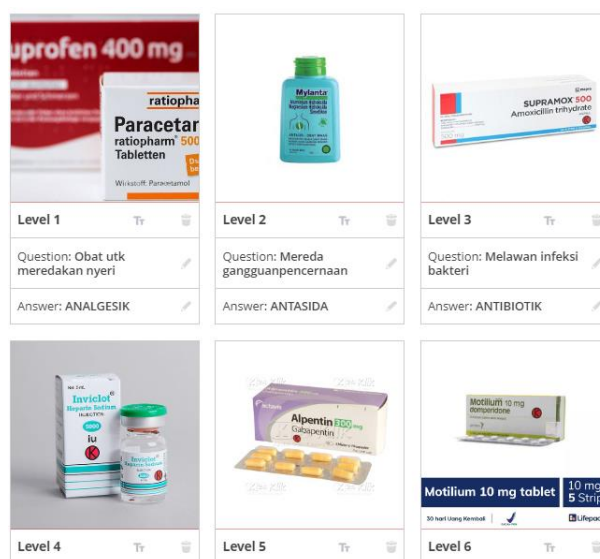


Image 2. (Med-Pharm Games Application Level)

The game application was validated by two media and materials experts who are diploma lecturers in the Pharmacy Department, Poltekkes Kemenkes Surakarta. Applications are assessed for suitability through the questionnaire in Table 1.

Table 1 Validation Results by Media and Material Experts

No	Question	Media and Material Expert 1	Media and Material Expert 2	Media and Material Expert 3
1	The questions displayed in the game are in accordance with learning objectives	5	5	5
2	The questions displayed in the game are in accordance with competency achievement	5	4	4
3	This game can give rise to independent learning initiatives	5	4	4
4	This game covers a little pharmacology material	5	4	4
5	The level of difficulty of the questions in this game is in accordance with the abilities of students in general	4	5	4
6	The questions presented are appropriate to current conditions	4	4	4
7	Questions are arranged coherently according to student understanding	5	4	5
8	The grammar used is in accordance with Indonesian and pharmaceutical rules	4	5	5
9	This game can help lecturers in carrying out learning activities in class	5	5	5
10	This game can help students understand pharmacology courses	5	5	5
11	This game can develop student learning motivation	5	4	4

Description: 5 = very good; 4 = good; 3 = sufficient; 2 = poor; 1 = very poor

Identification of tendencies for high and low scores is determined on ideal criteria based on research data scores on a Likert scale with a data range of 1 to 5. So an ideal score is obtained which ranges from 11 to 55 so that an ideal mean value (Mi) is 33.00 and a standard deviation is obtained. (SDi) of 0.09. Based on calculations, the level of feasibility of Android-based learning media, namely Med-Pharm Games, according to media and material experts, is included in the appropriate category with a very good (SB) predicate with an average score for the overall assessment aspect of 50.00 from a maximum average score of 55.00 percentage ideality is 90.90%, which means that learning media has a reality value greater than 75% so that learning media is worthy of development. Based on criticism and suggestions from media and material experts, several revisions can be made in accordance with media and material experts' suggestions, namely regarding adding drug classes, dosages and side effects as well as adding questions to the Med-Pharm Games application. Based on data calculations from media and material experts with a total of 11 assessment criteria items with 3 criteria aspects as in Table 2.

Table 2 Percent Ideal Value of Media and Material Expert Validation

No	Criteria Aspect	Percentage Ideality (%)			Average (%)
		Expert 1	Expert 2	Expert 3	
1	Learning objectives	100	86.67	86.67	91.11
2	Content quality	88	88	88	88
3	Feedback and motivation	100	93.33	93.33	95.56

The validation results of the Med-Pharm Games Android application from media and material experts stated that the Android-based Med-Pharm Games application developed was in the appropriate category with a very good predicate. This is in line with previous research by (Sari, Saputro and Hastuti, 2014) with a chemistry educational game based on Role Playing Game (RPG) which was developed to meet good criteria for independent chemistry learning with the assessment from the validator being said to be good. Based on previous research by (Harwanto, 2019), the 2D Educational Game Application for Learning Simple Chemical Elements and Compounds can teach knowledge of chemical compounds and elements effectively.

The Android-based Med-Pharm Games application motivates students to study the material provided carefully, memorize the names of medicines and their uses through games, and makes students happier in learning because the application is packaged interactively, so students can learn anytime and anywhere with using smartphones that students often use in their daily lives. The results of research by (Laila, Hb, & Irsadi, 2016) suggest that pictures and animations make it easier for students to understand the content of teaching material.

Conclusion and Suggestion

Med-Pharm Games application has the characteristics of a word guessing game which contains questions regarding the names and uses of drugs in the pharmaceutical field. This games application is easy to use (user friendly) for Android smartphones or laptops or PCs (Windows). The feasibility of Android-based learning media, namely Med-Pharm Games, is based on media and material expert validation with an ideal percentage of 92.67% which is included in the feasible category with a very good predicate. The suggestion that can be given to future researchers is to add levels to the games so that students can know more about the names and uses of drugs. Apart from that, it is necessary to add material in the form of modules or e-books as an introduction to pharmacology material. And games should be classified based on drug class, dosage and side effects.

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