# Development of Learning Media with QuickAppNinja Android-Based (Guess Image & Find Words) to Increase Elementary School Teachers' Digital Literacy

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**Abstract:** In the era of the industrial revolution 4.0, all forms of technological progress were massively implemented in various aspects of life, including education. Teachers must have skills in media, information, and internet networks, constructed as Digital Literacy skills. This study aims to develop learning media on the material at the elementary school level based on Android application techniques that teachers can use in learning activities. The research covers the stages of developing Android-based learning media using QuickAppNinja (student learning tools include searching for words and guessing pictures), then measuring the teacher's response to the developed application, and how digital literacy skills change in teachers after using the developed learning media. The research method adopts a design and development (D&D) model, including setting objectives, aligned assessments, making flowcharts and storyboards, selecting or creating media, creating interfaces, and integration. The instrument of research was used in the form of a multiple choice test that measures the respondent's digital literacy. Test results from 35 teachers, with an average score of 7.27 out of 10, mean the teacher is sufficiently mastering digital literacy skills.

**Keywords:** Android based; Elementary school teachers; learning media; QuickAppNinja

## Introduction

The development of innovative teaching media is urgently needed to trigger students' interest and enthusiasm for learning so that learning becomes more interactive (Kumar & Sharma, 2021). Media or intermediaries are usually used to convey messages through certain tools, but the role of the media can also be as a stimulus to thoughts, feelings and will (Lang et al., 2022). Therefore, formulation and creativity are needed in improving student performance to understand the learning material presented, which requires teachers to be more careful in selecting the media to be used (Mulyanti et al., 2022). There was a Government policy that regulated the National Education Policy Direction in the field of Primary and Secondary Education in 2001/2004, namely reforming and strengthening the education system. The goal is to optimize the quality of educators and educated them to have superior quality in the learning process (Vial et al., 2015).

Since a long time ago, visual learning media has often been used as an attraction for students in the learning process (Snyder, 1999), so visual learning media in this era and era which is supported by fast technological advances provides space for educators to explore new things (Nitsche et al., 2023). Of course, the journey is not easy, but the ultimate goal is how to create the quality of students to increase motor or psychomotor abilities. One of the benefits of applying educators' creative power does not stop at creating superior quality students (Stewart, 2023). Far from it, visual learning media provides mutualism to educators so that they always develop a rationalist mindset.

The use of technology as a learning media makes it easier for both teachers and students to manage, convey

information and create a different learning experience (McLaren et al., 2022). Today, education and technology are something that cannot be separated. Because teachers do not always use conventional methods in teaching, therefore technology-based learning media should be used. Because learning that uses media content can stimulate students' intellectual activity (Yulianti & Ekohariadi, 2020). Educational games generally attract users to improve their knowledge so this type of game can be used as a learning media for students to understand the material (Haimovich et al., 2022; Kurniawan et al., 2017). Games are games with computers, including problem-solving games that require logic skills, strategies, pattern recognition, completion sequences, completeness of words, or even in some cases there is a luck factor. However, nowadays games cannot only be played on computers but can be played via smartphones.

Android is an operating system and software platform for mobile devices, based on the Linux kernel developed by Google (Fitriyana et al., 2018). Through Android, we can connect hardware devices directly either through smartphones or other electronic objects, such as televisions, clocks, and so on. The life that goes hand in hand with technological progress certainly must understand all forms of development. Android is a Linux-based operating system designed for touchscreen mobile devices such as smartphones and tablet computers. Android applications are developed in the Java programming language using the Android software development kit (Nur Fitriyana et al., 2020; Nugraha et al., 2021). The Software Development Kit (SDK) consists of a suite of development tools, including a debugger, software library, QEMU-based handset emulator, documentation, sample code, and tutorials. The birth of android applications in society is an important element in life, especially in terms of utilization which are seen as making a significant contribution to the world of education.

Choosing the appropriate application category makes it easier for application users to choose the desired application, to publish android applications to the Google Play Store, it is necessary to prepare promotional media in the form of titles, short descriptions, long descriptions, icons, promotional banners, email contacts for sending emails, as well as promotional videos (Nofitasari et al., 2021). Applications made by application/game developers must understand the application guidelines that are allowed or not allowed to be distributed to the Google Play Store through the Google Play Developer Policy Center. There are various ways to develop Android-based applications. One way is to use the android builder tool. This Android builder is website-based software that can

help us create Android applications even without programming skills.

In this research, the tools that will be used in developing android applications with the help of an android builder can be accessed at the website address quickappninja.com. QuickAppNinja is an android builder application that can make your own quiz game easily and quickly and does not require any coding skills (Dharma Atmaja, 2022). Applications made with QuickAppNinja can run on the Android operating system and can be played on smartphones. Guess the image game is an Android-based image guessing game application that can be played by answering each image displayed. Questions are in the form of shaded images or in the form of a combination of four images in which the image has an answer key. While the game finds words is an Android-based game application to find words (Daniyarova et al., 2022). How to play it by pressing the button and sliding the smartphone touch screen until you find the right word. This find words game is similar to a puzzle game where we are required to find and search for the appropriate word and then assemble it into a single word that can be read.

Currently, in the era of the industrial revolution 4.0, all forms of technological progress are being implemented massively in various aspects of life, including in the field of education (Jatmiko et al., 2018). Thus, teachers are also required to have skills in integrating technology into learning and teaching activities. Teachers need to have skills in fields related to media, information, and internet networks that are constructed in the form of Digital Literacy skills (Snyder, 1999). Digital literacy includes many things, namely not only skills in utilizing technology but also in applying it to teaching activities for students. Digital literacy is also a skill in wisely selecting the flow of information on social media. Several studies show that there are still many teachers with low digital literacy (Baroudi et al., 2022; Dewi & Alam, 2020; Hannaway & Steyn, 2017). Efforts to increase teacher digital literacy are by getting teachers used to utilizing technological media in learning activities, one of which is by utilizing android-based applications in learning activities.

Elementary school is the first level where students start learning activities more seriously when compared to kindergarten which is still full of games. Even so, learning at the elementary level still requires teachers to be creative in learning, so that the transition period of students from learning activities that are full of games to learning activities that are already full of content, still attracts students' interest. Learning activities that are full of content and knowledge must be packaged by the teacher as attractively as possible (Slim et al., 2022). Currently, students are accustomed to using gadgets or

smartphones, this is an opportunity for teachers to package learning using technology. Along with getting used to the use of technology in learning, it will increase teachers' digital literacy. Based on this explanation, this study developed learning media on the material at the elementary school level, based on Android application techniques that teachers can use in learning activities. The developed learning media aims to familiarize teachers with using technology, and will contribute to increasing teacher digital literacy.

## Method

### Research Design

This study adopts the design and development (D&D) model developed by Richey dan Klein (2007). The D&D model includes the process of design, development and evaluation. The purpose of this research is to design learning media based on Android QuickAppNinja (guess image & find words game) to increase elementary school teachers' digital literacy. Development stages in research with the D&D model according to Peffers *et al.* (2007) includes:



**Figure 1**. Steps of D&D model

### The Digital Literacy Test Instrument

To obtain research data, an instrument was used in the form of a multiple choice test that measures the respondent's digital literacy. The test developed from research (Mawarni et al., 2021), through the stages of defining and articulating media and information needs (including terms in Android-based applications, such as searching for words and guessing pictures), organizing media and information (covering the steps for using the application), and utilizing communication and systems in media and information (including applications concrete in learning)

### Research Subjects and Locations

The subjects in this study were 35 elementary school teachers at one of the public elementary schools in Semarang City, based on the results of preliminary research at the problem identification stage.

## Result and Discussion

### Identification of Problems

At this stage, the identification of problems to be solved through research is carried out. Existing problems are expected to be resolved with the existence of products developed by researchers. Identification of the problem is done through analysis of literature studies and field studies. The activities carried out in the preparatory stage were conducting interviews with several teachers in elementary schools in the city of Semarang. The interviews conducted were regarding the completeness of infrastructure that supports the use of IT and problems related to the use of IT in schools. The results obtained are that the infrastructure facilities that support IT have started to be sufficient, as evidenced by the reactivation of computer laboratories, but the use of IT in schools has not been optimal due to a lack of human resources who are experts in this field.

### Describing Goals

The findings from problem identification are that a learning media that applies technology is needed for teachers in elementary schools. Based on information from interviews, the availability of computer equipment can support the application of technology in learning in schools. Specifically, the objectives of this study are as include developing Android-based learning media using QuickAppNinja for student learning tools including finding words and guessing images, knowing the results of developing android-based applications on learning materials in elementary schools, knowing the teacher's response to the application that was developed, and knowing changes in digital literacy skills in teachers after using the developed learning media

### Product Design and Development

Android application-based learning media was developed based on the design model from Martin and Betrus (2019). The design and production model procedures from Martin and Betrus (2019) follows Creating the object. At this stage the system, objectives and constraints encountered are determined, then explained in detail as well as specifications in making the system. When designing an application device, requires a process of identifying and depicting the basic system abstraction of the application device and its correlation. Next is aligned assessments. At this stage, researchers evaluate each component needed in media development. Such as hardware (hardware) and software (software) by forming the overall system architecture. So the researchers create flowcharts and Storyboards. At this stage, it is determined how the application flow will be developed by first designing it

in the form of a storyboard. The third is creating the media (text, graphics, animation, video, audio). At this stage, the researcher selects what components are needed in designing the media, including learning content that is tailored to the curriculum and selects the game template in QuickAppNinja to be used.
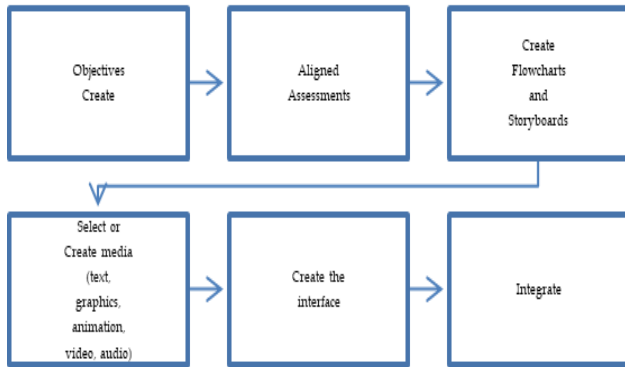


**Figure 2**. Product design stages (android-based learning media)

The next step is creating the interface. At this stage, the author practices using the QuickAppNinja application as a tool for creating android applications without coding. First, the user must register via email in order to access the application. after success, you can then create a new game by selecting the "Create New Game" button as shown in Figure 3, include QuickAppNinja has four choices of game templates consisting of guess the picture, tile, 4 pics 1 word, and find words templates, guess the picture is a game that contains guessing pictures accompanied by word clues, tile is a guessing game whose contents are shaded or partially covered, 4 pics 1 Word is a game to guess words from 4 pictures presented in 1 game box, this game is very popular because it sharpens the brain of its users, and find word is a word search game from a collection of available words. The last step is integrating. After going through the system design stage, the next step is the realization of the application design as a program unit (Figure 4). Here is one view of the application being developed.
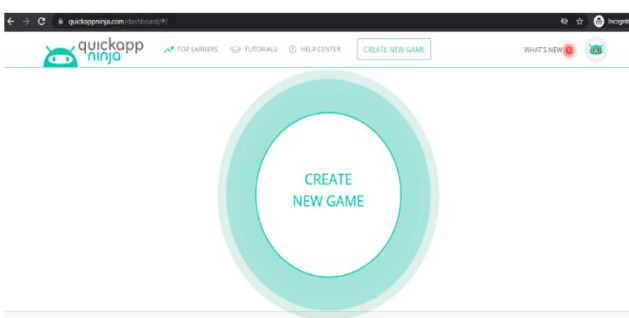


**Figure 3.** Create new game



**Figure 4**. Application for guessing animal images

Select the guess image game, then set the appearance of the game by selecting a design which includes themes, gameplay, completed, hints, get coins, buy coins, menus, and rate us. Before being distributed to clients, the steps that must be taken for testing of program units. These program units are tested as a complete product to determine whether the system can function properly or not.

*Product Trials*

The product development was then tested on subjects who would use the media, namely as many as 35 elementary school teachers at one of the elementary schools in Semarang City, with face-to-face activity.
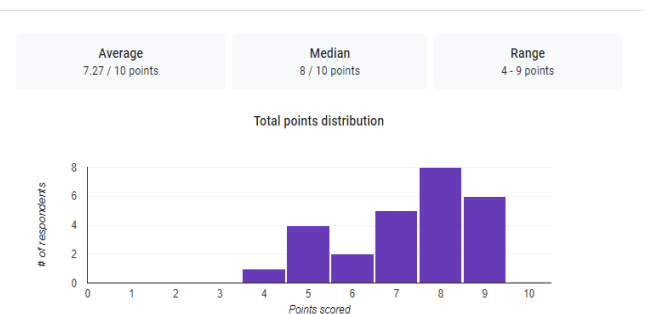
*Evaluation of Trial Results*



**Figure 5**. Average test results in the evaluation process

Evaluation is a process of ensuring that the product being developed has been properly designed, with the goal of efforts to improve the digital skills of elementary school teachers. In other words, evaluation is the process

of determining whether the product being developed is suitable for use as a learning media that can improve teachers' digital literacy skills. The evaluation is carried out by giving a test that measures the teacher's digital skills, consisting of 10 multiple-choice questions. The results of the evaluation of 35 teachers can be seen in Figure 5. The average score is 7.27 out of 10, which means that the teachers are in the adequate category of mastering digital literacy skills.

*Communicating Results Trials*

The resulting data analysis is then concluded to be reported in the form of an article that is currently published. The results of the study show how the process of developing learning media based on android QuickAppNinja (guess image & find words) is to increase elementary school teachers' digital literacy.

## Conclusion

QuickAppNinja Android-based learning media has been developed, through word-finding and picture-guessing games. The learning media was tested on 35 elementary school teachers, and their digital literacy skills were evaluated. After using the application that has been developed in learning activities, it is known that the teacher's digital literacy measurement test gets a pretty good average score of 7.27. It can be concluded that android-based learning media in elementary school learning materials is proven to improve the digital literacy skills of elementary school teachers.

### Author Contributions
This research contributes to the treasury of digital-based learning media that teachers in elementary schools can use. The author is involved in the overall making of this article.

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### Conflicts of Interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

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