
DESIGN AND USE OF QUICKAPPNINJA-BASED ANDROID GAMES IN MATHEMATICS LEARNING THROUGH GOOGLE MEET

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ABSTRACT

One of the platforms that can be used for online learning is Google Meet, which is a product made by Google. Google Meet can replace the conventional form of class into an interactive virtual class. The use of quickappninja-based android games in learning mathematics through Google Meet is a medium that can make learning more varied and interesting. Quickappninja is a device in the form of web pages that can be accessed online to create android games using HTML language. Using Quickappninja is easy because it does not require a programming language. In making android games through quickappninja, teachers will be more flexible in developing games according to their needs and subject matter. Apart from being delivered classically through Google Meet, this android game can also be used independently for students as a medium of learning at home, as well as repetition of material for students so that they can better understand math subject matter.

Keyword: Games, Android, Learning, Math.

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INTRODUCTION

Entering the era of the industrial revolution 4.0, the role of technology is very large in supporting communication and information delivery. The industrial revolution 4.0 in the midst of the influence of globalization can have both negative and positive effects on society. The communication process can occur not only at close distances but also at long distances thanks to internet technology. Competition between countries also has the potential to occur because everyone wants to be a leading country, able to compete and develop to be more advanced. This has an impact on every country's efforts to improve the quality of human resources. In order to realize quality human resources, it will not be separated from the development of innovation in education. The quality of the education system is a priority that must be continuously improved and evaluated. All components of education need to realize that the use of technology is inevitable, so that the integration of technology in education becomes a necessity. As part of a single unit in education, learning is a component that needs to integrate the use of technology in an effort to create a fun and contemporary learning atmosphere. The use of technology in learning can be done if every component in education is more optimized and improved, such as the curriculum, teaching and educational staff, as well as facilities and infrastructure. The use of technology in learning is not an

absolute guarantee that it can improve student learning outcomes instantly, but the application of technology can be a solution to increase student learning motivation.

The impact of the Covid-19 pandemic directly and indirectly has a positive and negative impact on the world of education. Before the pandemic, the percentage of technology application in learning was still very small compared to conventional learning processes. However, during the pandemic there was a change in new lifestyles, including the learning system which underwent drastic changes. The learning from home policy set by the Government has resulted in the use of technology in learning being unavoidable. Online learning either through laptops or mobile phones has become a daily routine for educators and students. In the new normal phase of entering learning in the industrial era 4.0, online learning is no longer an alternative choice but may become a necessity. There are many digital platforms in the form of applications and websites that provide online learning media such as Google Classroom, Edmodo, Schoology, Zenius, Teacher's Room, and so on. Online learning does not only talk about the process but also about variations in learning, for example games or games related to certain materials. The use of games in learning can be a solution to avoid boredom in learning, in addition to increasing students' motivation and understanding. Mathematical material is one of the materials that has the potential to be developed in the form of digital platforms such as Android-based games. The development of Android-based games can use various applications, both using programming languages and not. Development of android games without a programming language can be done through web pages such as quickappninja.com. Through the quickappninja.com page, users can just use the available templates without having to input code. In this article, we will present the design of learning mathematics with Android-based games on triangle material.

METHOD

This research uses a qualitative approach with the method of library research and simple development of android games through the quickappninja.com web page. The steps taken are collecting information sources that have relevance to topics related to android application development and trying to design android games that can be used in learning mathematics. Reference sources are obtained online from electronic books, scientific articles from online journals, and website pages. The information obtained is then collected and synthesized so that a description is obtained according to the topic of study related to learning mathematics with android-based games on triangle material. Furthermore, based on the selected material, namely triangles, then an android game design was developed through the quickappninja.com web page. After the game is finished, then this game will be used in online learning through Google Meet.

RESULTS AND DISCUSSION

1. Android Operating System

Android is a modified Linux-based mobile operating system intended for smartphones or tablets. Android was developed by the Open Handset Alliance as a consortium of developers supported by Google. Initially, the Android operating system was developed by the Android company, Inc, which was founded by Andy Rubin, Chris White, Nick Sears, and Rich Miner. Then Google acquired the company Android Inc in July 2005, including recruiting its main founder. In

2005, Android was not so popular, considering that Android was still in the development stage. Google under the command of Andy Rubin tried to develop an operating system on mobile devices based on the Linux kernel. Then this operating system is marketed by Google to handset manufacturers with the advantage of system availability that can be upgraded. On November 5, 2007, the first android system was released, followed by the launch of the first mobile phone using the android operating system, namely the HTC Dream in 2008. At first, many people thought that the android operating system was a desktop system because it was developed with a linux kernel base that has various features and functions. The Android user interface consists of windows, views, and widgets that can display lists and drop-down lists. An overview of the Linux kernel-based android operating system is shown in the following figure.

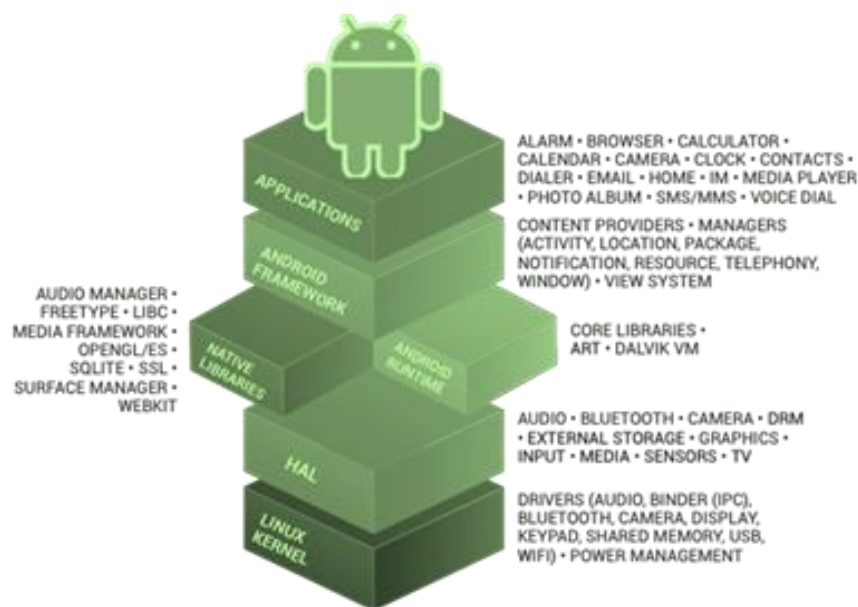


Figure 1. Android Operating System

In recent years, smartphones have been able to change the system in the mobile web including the android operating system. Improved utility in web technology-based mobile devices that are more responsive so they can adapt to different smartphone screen sizes. The Android operating system consists of several layers such as applications, application frameworks, libraries, and the Linux kernel. Applications consist of built in applications such as telephone, contacts, browsers, and other applications. Then there are special applications whose variations depend on the version and type of smartphone. Then there are application frameworks such as phone management, notification management, content management, and other system management. In the library there are graphics libraries, media libraries, database libraries, and sensors. Other system management in the Linux kernel are power, files, drivers, and processors.

Android applications are classified into 4 namely activities, services, content providers, and broadcast receivers. Activities are the implementation of the visible user interface, such as selecting the application to be used, which in the Android system is described as follows.

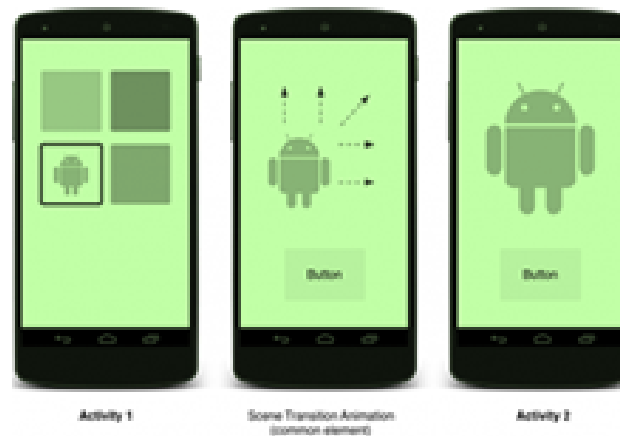


Figure 2. Activities

In addition to activities in the Android operating system, there are also services whose use can be accessed in the settings contained in each smartphone. These settings can be network monitor, application update, or notification management. This service has a function to manage a feature on both the smartphone system and applications that can also run in the background when we use different applications, such as music applications. In addition, there are content providers, which are content providers with certain instructions from one application to another. In this case the instructions are handled by a method of the Content Resolver class, with the data being stored in a file system or database. This content provider is displayed as shown in the following image.

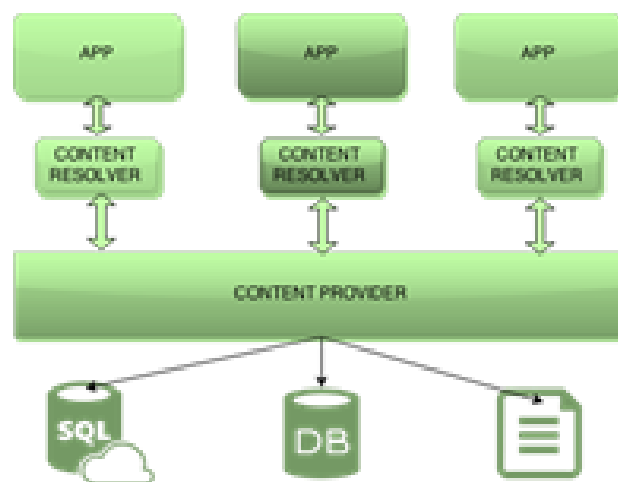


Figure 3. Content Provider

The next part of the android system is the broadcast receiver which is the recipient of messages from an application or system. Through a broadcast receiver, an application sends messages containing certain instructions to other applications. This broadcast receiver handles

the communication and appropriate actions through sending and receiving messages as intent objects.

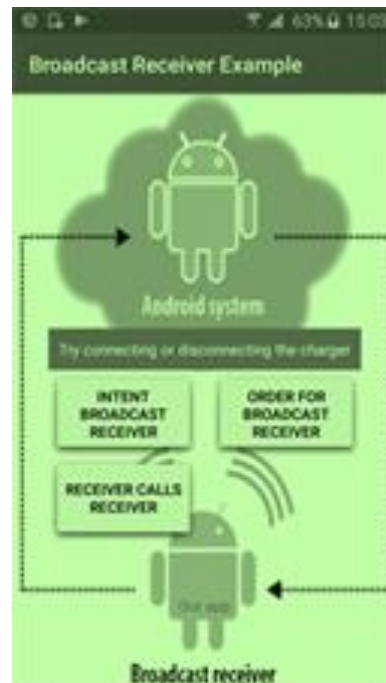


Figure 4. Broadcast Receiver

Android applications are used in conjunction with a file called `AndroidManifest.xml` which serves as a sheet that provides information about the interaction of the operating system with the application. The file consists of class names and event types to provide whether or not certain applications can access other applications on our smartphones, so that it will provide security for users. Apart from the applications running in the system as mentioned above, android also has key features such as interface, applications, and memory management. In the user interface features, you can perform actions to give instructions to objects on the screen, such as touch, swipe or zoom. In the interface, when the smartphone is turned on, a home screen will appear, which consists of the main navigation, application icons, and widget. Application icons have a function in running applications, and widgets function to display certain content such as email, clock, weather, or news. At the top of the screen is called the status bar which contains operator network information, battery, and other information. If the status bar is pulled, you will see certain application notifications such as messages and device updates. Notifications on every Android system update are always refined, making it easier for users to access certain features. The applications available on Android are very diverse and available on Google Play or now called the Play Store. In the Playstore, users can download and update applications. Play Store implements a security system by closely monitoring applications made by third parties, according to the compatibility of smartphone devices. The available applications are free and paid, so users have the flexibility to choose which applications to download. Applications running on the

android system can run if they are supported by a memory management system that is designed to manage RAM memory so that power consumption can be minimized, considering that smartphone devices run on battery resources. RAM memory management system will manage android apps that are not in use automatically suspended or idle in the background without consuming excessive battery power. When the app is sitting in the background it will be re-opened it will be easier to access without opening the app from scratch. This memory management system works automatically when the memory is low, the system will temporarily disable the application.

2. Making Android Games via Quickappninja.com

Quickappninja.com is a device in the form of web pages that can be accessed online to create android games using HTML language. Using Quickappninja.com is easy because it does not require a programming language. Making android games through the Quickappninja.com web page is done through the following steps.

a. Masuk ke halaman quickappninja.com

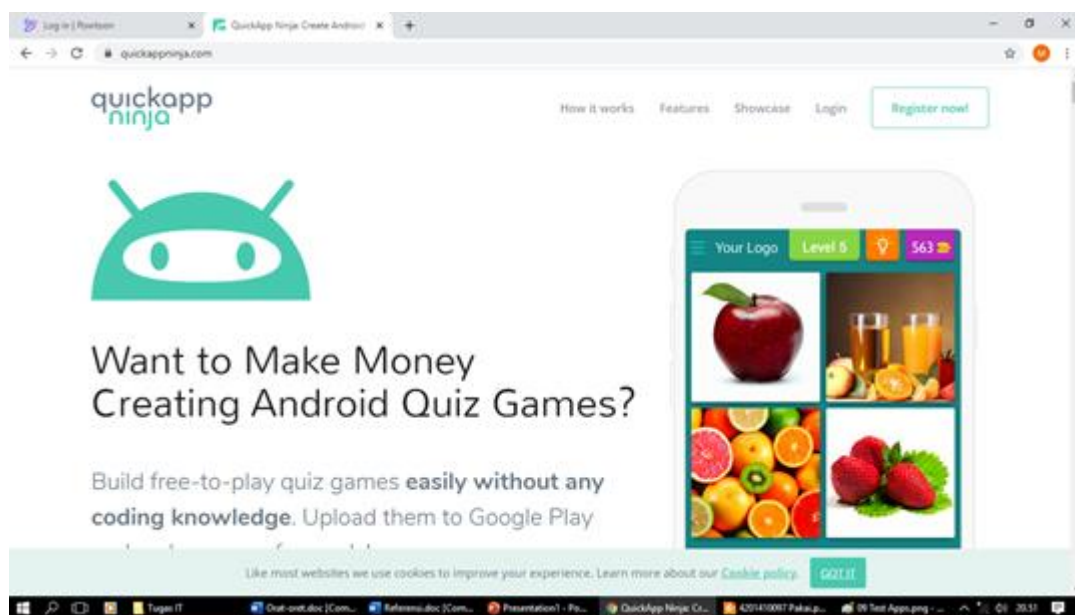


Figure 5. Home Quickappninja.com

b. Sign Up atau Login menggunakan email (gmail)

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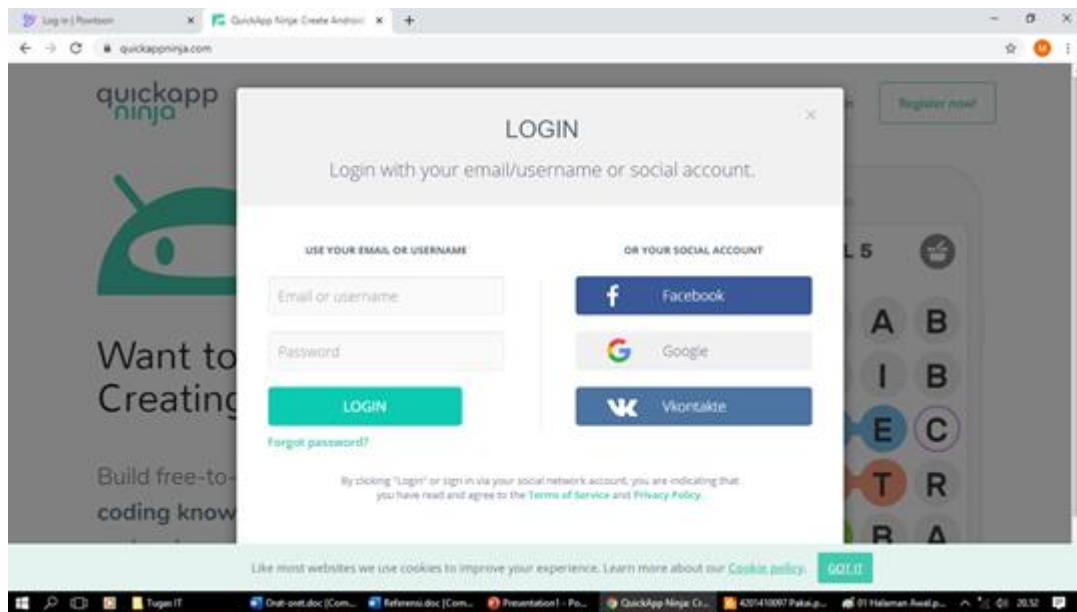


Figure 6. Quickappninja.com Login Display

c. Register for an account if your email has never been registered before on quickappninja.com

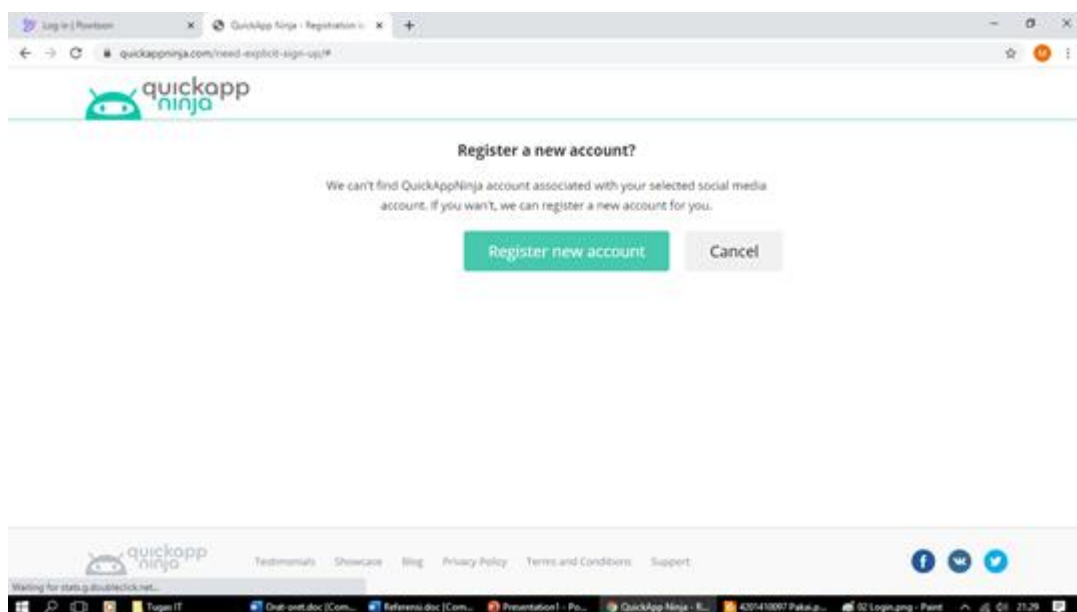


Figure 7. Account Registration Instructions at quickappninja.com

d. Complete account registration

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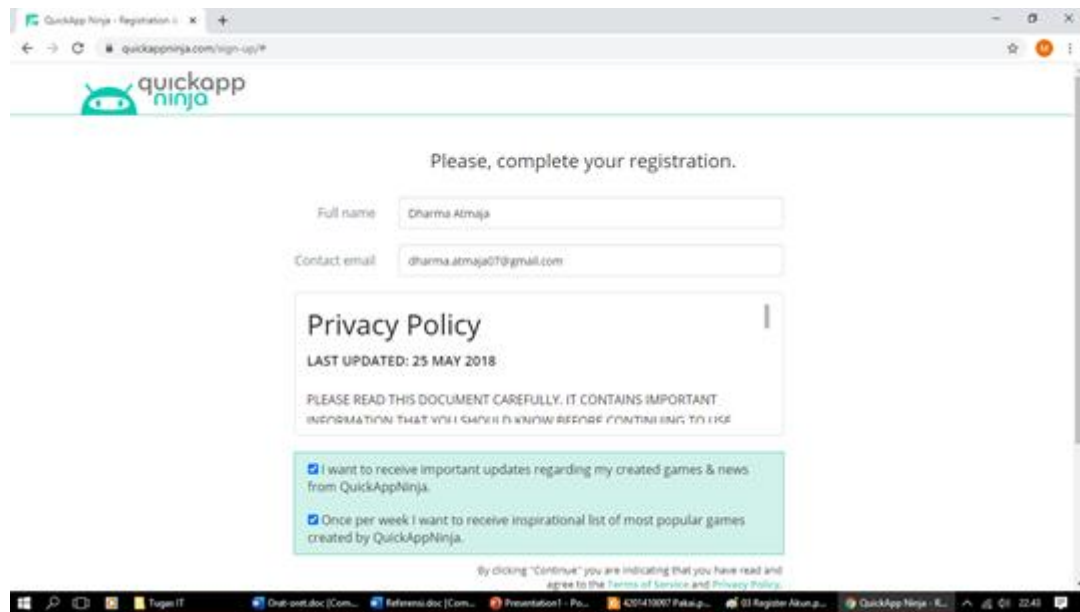


Figure 8. Account Registration Display on quickappninja.com

e. Start creating a new game

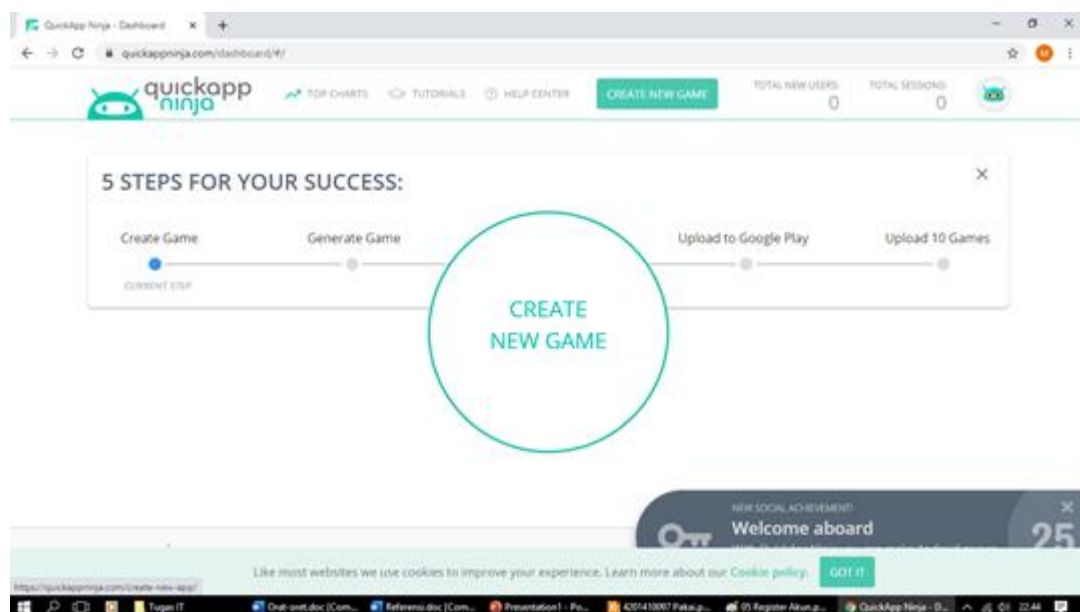


Figure 9. Front View of Creating a New Game on quickappninja.com

f. Choose the type of game to be created. For example, choose type 4 pics 1 word.

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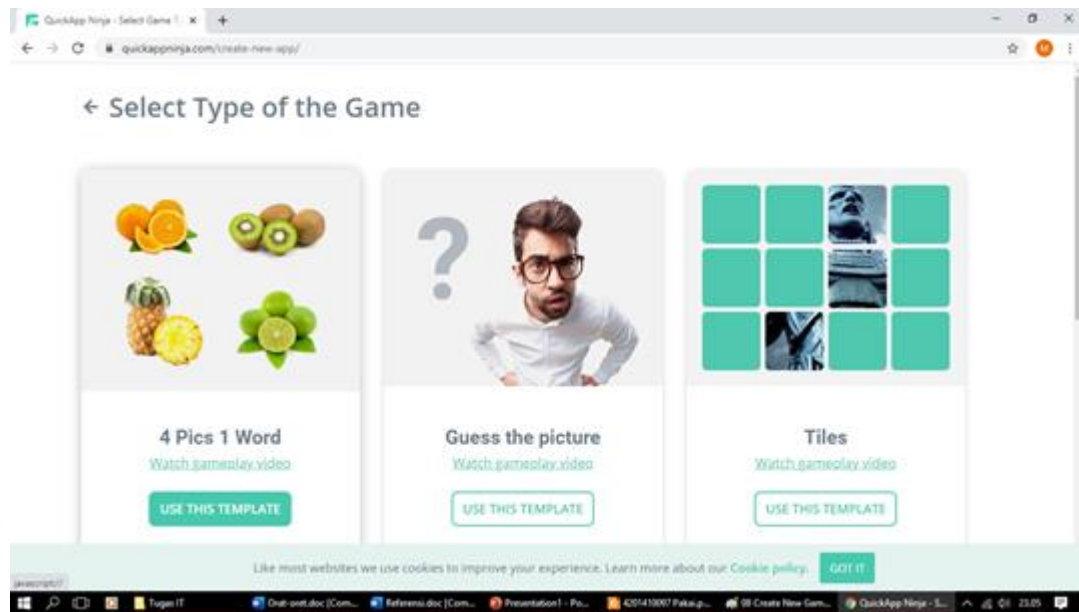


Figure 10. Game Category Options on quickappninja.com

g. Determine the design to be used

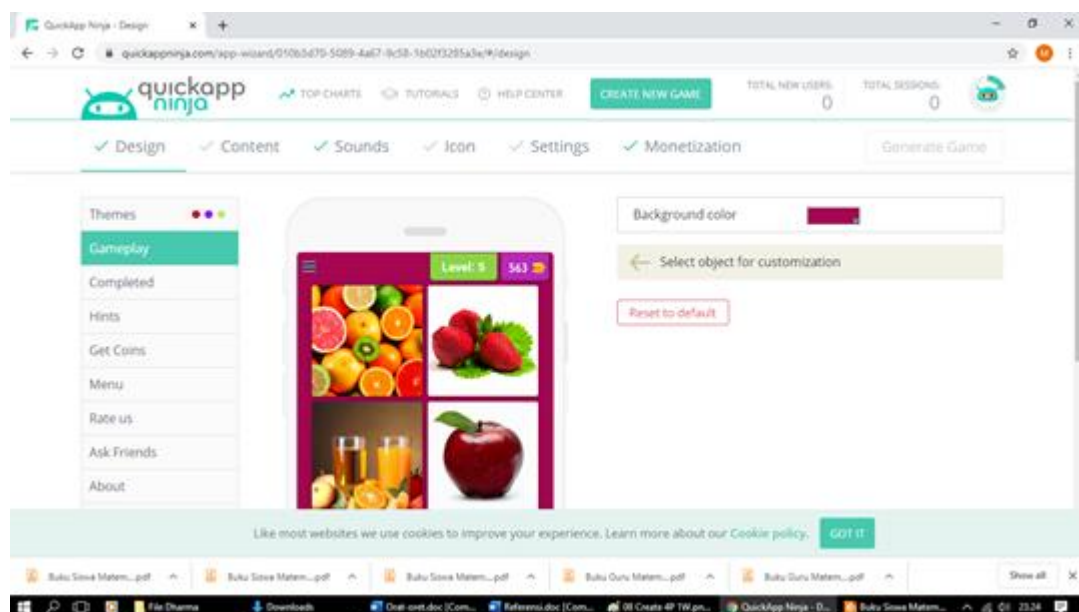


Figure 11. Game Design Settings on quickappninja.com

h. Choose the language used in the game

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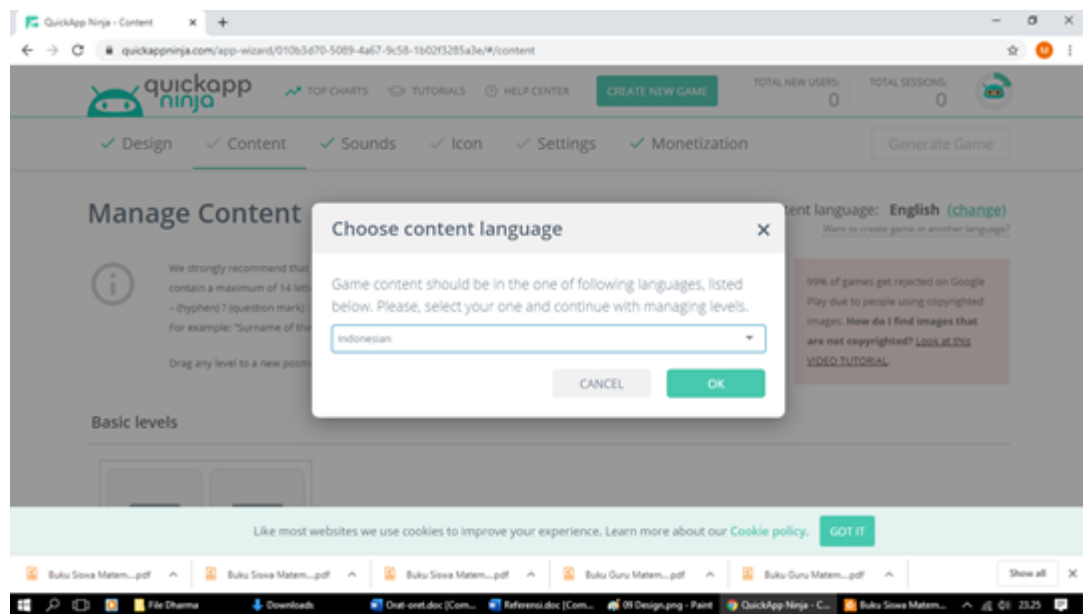


Figure 12. Language Selection on quickappninja.com

- i. Uploading each photo that will be used as game material

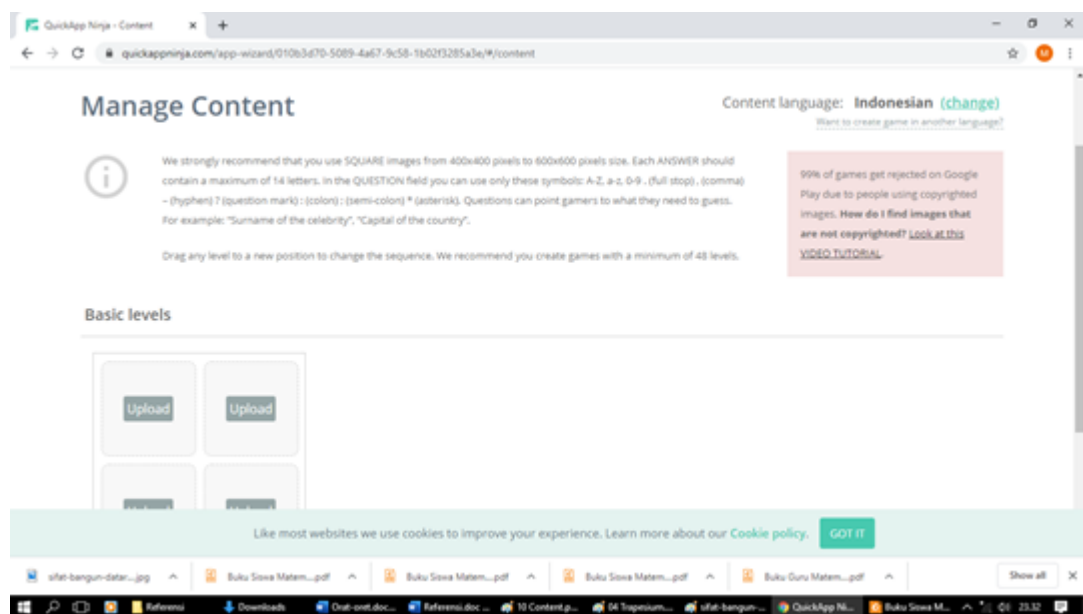


Figure 13. Game Content Management Settings on quickappninja.com

- j. Uploading photos as game material as follows

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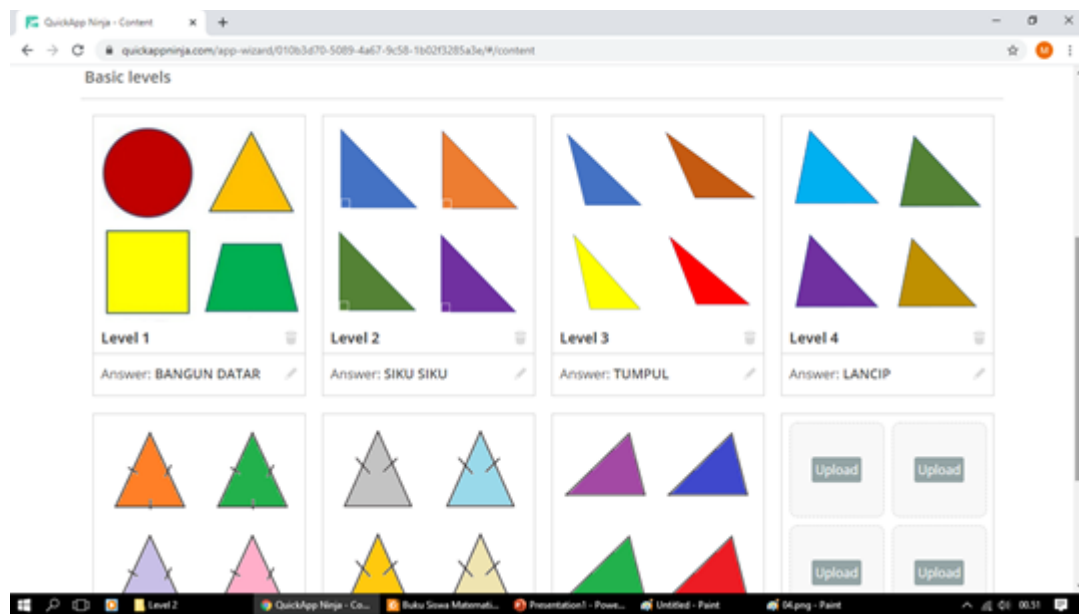


Figure 15. Game Design that has been made on quickappninja.com

k. Making sound settings

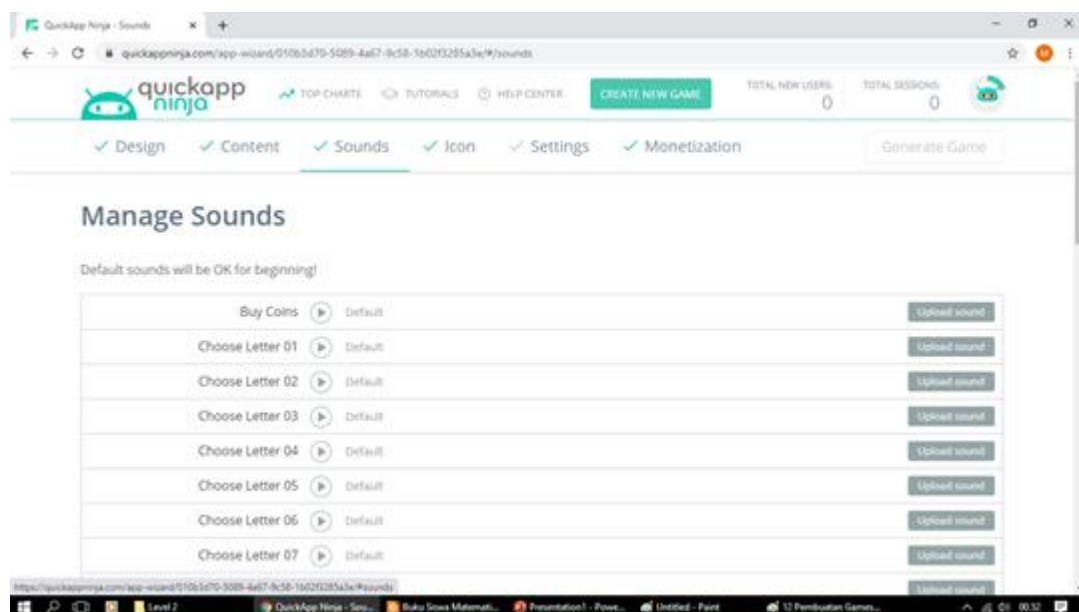


Figure 16. Game Sound Settings on quickappninja.com

l. Choose a game icon

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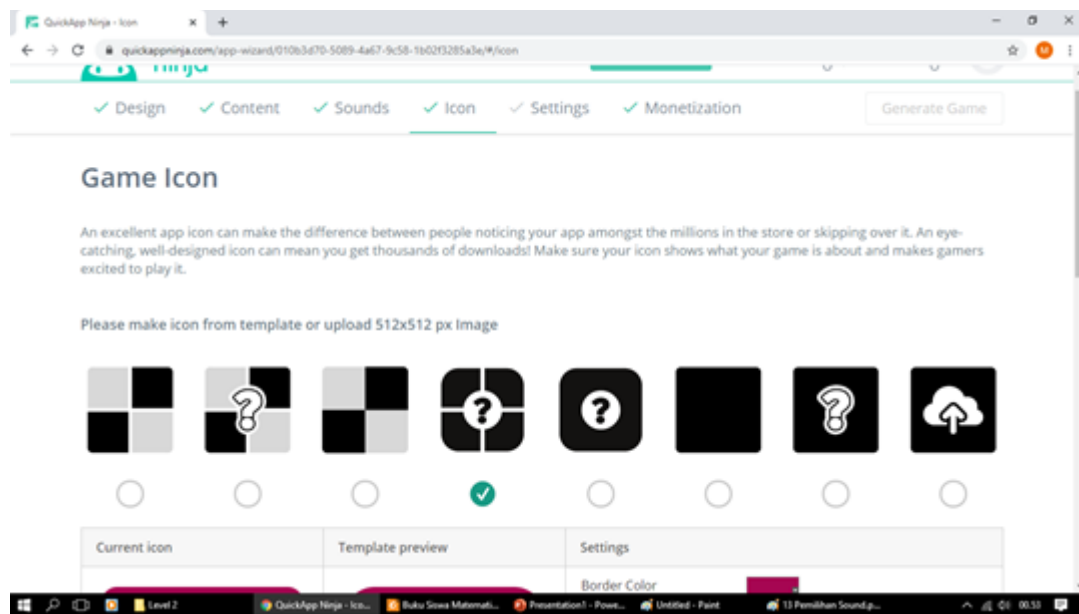


Figure 17. Game Icon Settings on quickappninja.com

m. Setting game settings

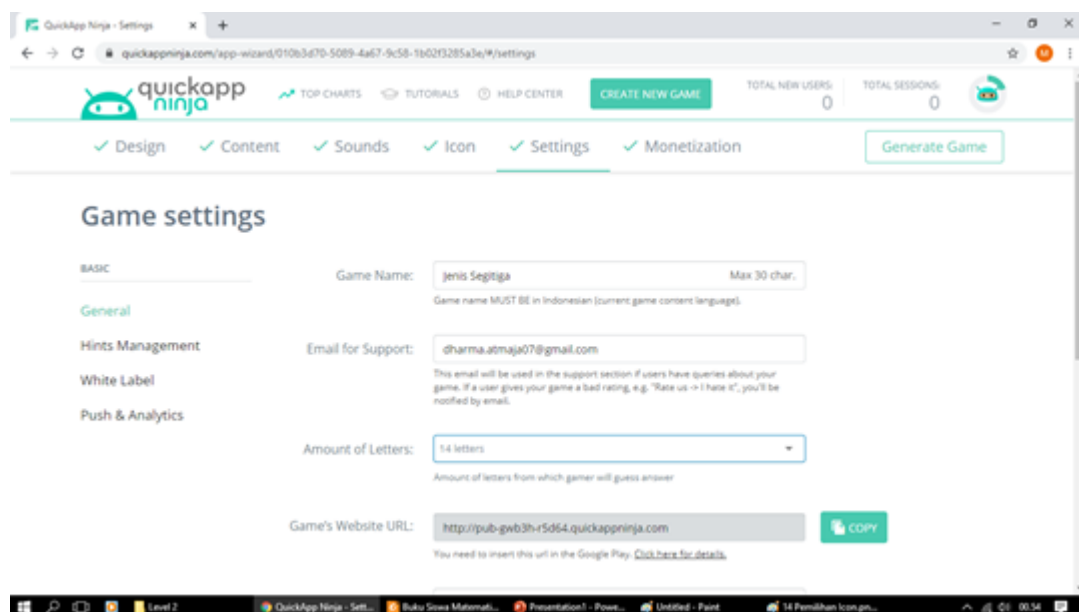


Figure 18. Game Settings on quickappninja.com

n. Generate games

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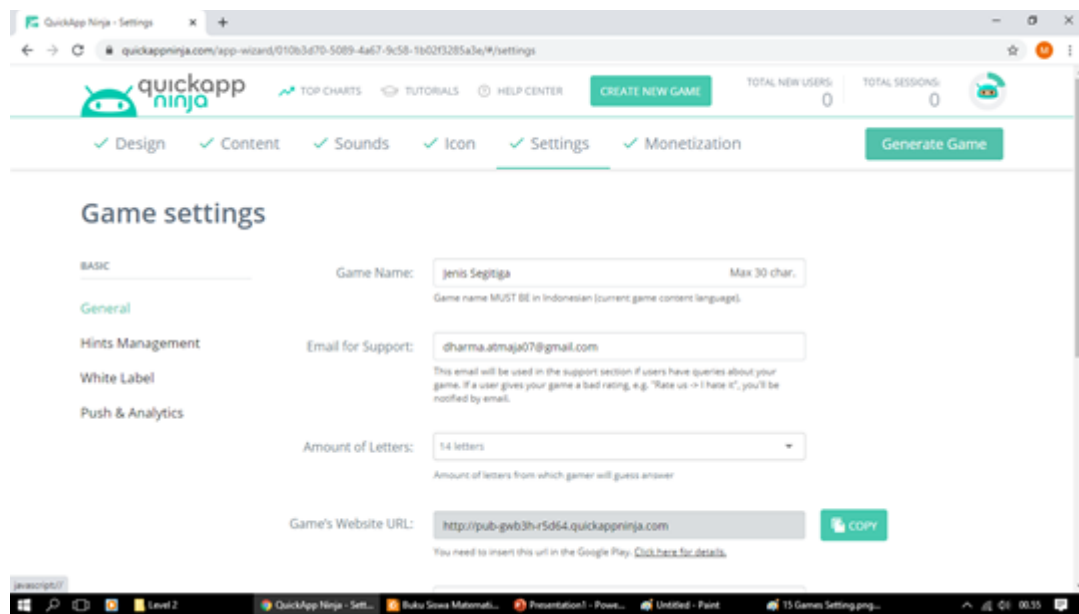


Figure 19. Generate Game button on quickappninja.com

- o. The game generation process is in progress and you need to wait a while and a notification will be sent via the previously registered email

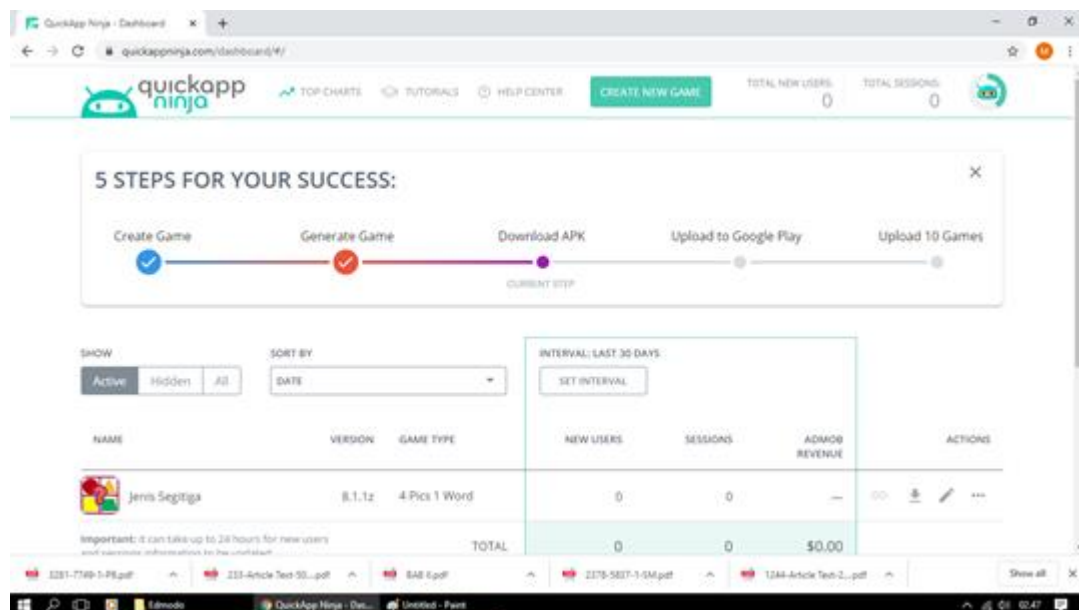


Figure 20. Generate Game Process on quickappninja.com

- p. If the game generate process is complete, then we can download and install the finished game or upload it on the play store. Games that have been installed can then be used as learning media

3. The Use of Quickappninja-Based Android Games in Mathematics Learning Through Google Meet

Online learning is an option during the current pandemic. There are many choices of learning media that can be used, both those based on the Learning Management System (LMS), Social Media, Messaging Services (Chatting), and Video Conference. One of the platforms that can be used for online learning is Google Meet, which is a product made by Google. Google Meet provides communication system services in the form of video which is an update to the previous application, namely Google Hangouts, which was discontinued in October 2019. Google Meet can be displayed on various web-based devices or smartphones. There are various features in Google Meet that can be used in learning, especially mathematics. Google Meet can replace the conventional form of class into an interactive virtual class. The use of quickappninja-based android games in learning mathematics through google meet is carried out through the following stages.

- a. Preparing pre-made android games
- b. Opening the Google Meet application on Mobile

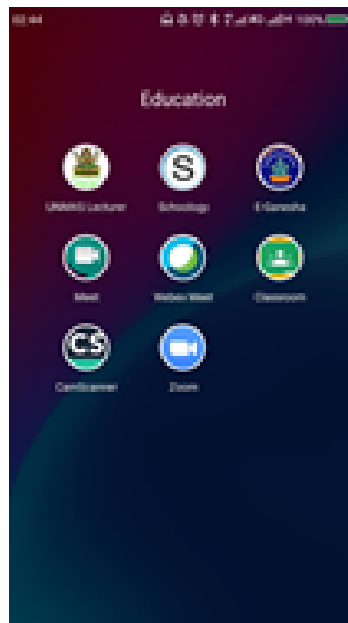


Figure 21. Google Meet Menu and Icon Display

- c. Select the New Meeting menu



Figure 22. Google Meet Initial Screen

- d. Share the link meeting address to students

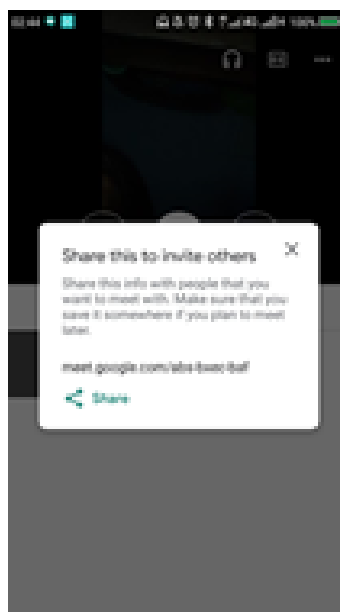


Figure 23. Google Meet link notification

- e. After all students join the google meet later, the teacher greets and asks students to make attendance on the chat menu and the teacher shows a share screen

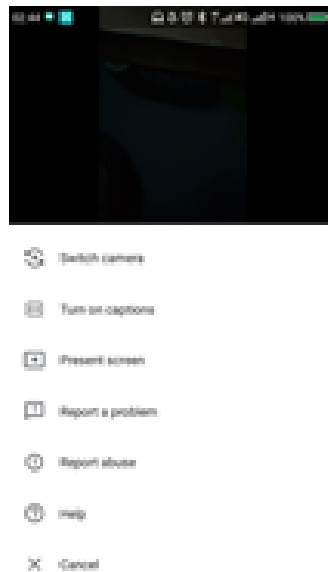


Figure 24. Menu options in Google Meet

- f. Carry out the stages of learning according to the learning plan. In the following mathematics lesson, an example of triangle material will be used
- 1) The teacher conveys the learning objectives, namely solving contextual problems related to area and perimeter

Learning Objectives

1. Students Are Able To Name The Types Of Triangles
2. Students Are Able To Solve Contextual Problems Related To The Area And Perimeter Of A Triangle

Figure 25. Share Screen Learning Objectives Display

- 2) The teacher delivers a concept map



Figure 26. Concept Map Share Screen Display

- 3) The teacher shows several flat shapes that exist in the surrounding environment



Figure 27. Share Screen Display of Flat Shapes

- 4) The teacher asks one of the students to name the flat shape according to the object displayed
- 5) The teacher conveys the material on the types of triangles, and asks students to give answers according to the display on the slide

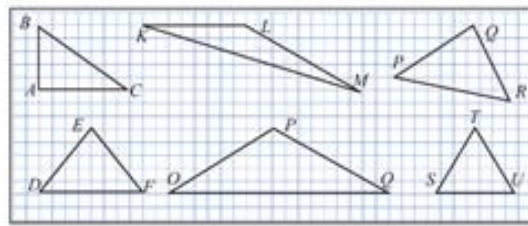


Figure 28. Share Screen Display Types of triangles

- 6) The teacher continues the material on the types of triangles by showing the 4P1P android game (4 pictures that represent 1 word)

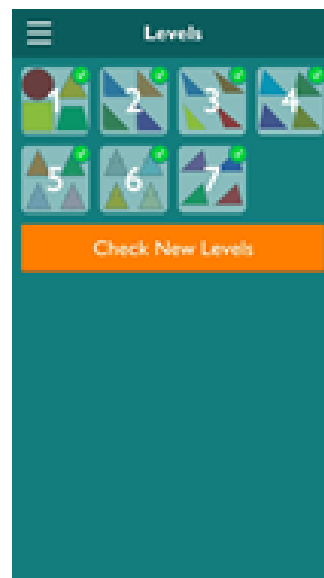


Figure 29. Display of Triangle Type Game Share Screen

- 7) Siswa menjawab setiap level game yang ditayangkan
Level 1

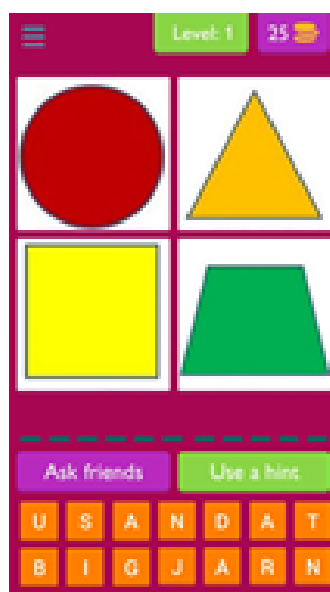


Figure 30. Share Screen Game Level 1 display

Level 2

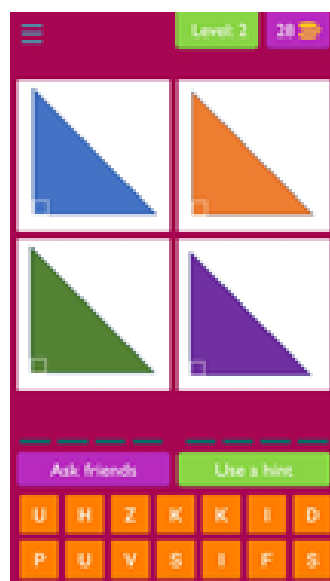


Figure 31. Share Screen Game Level 2 display

Level 3

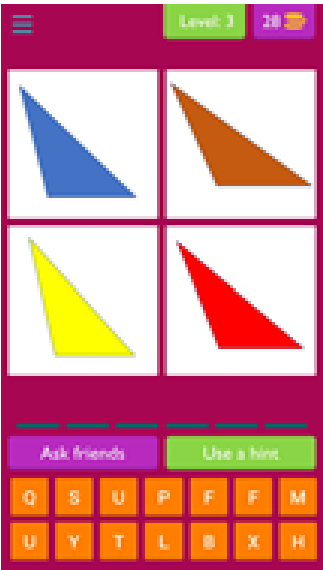


Figure 32. Share Screen Game Level 3 display

Level 4



Figure 33. Share Screen Game Level 4 display

Level 5

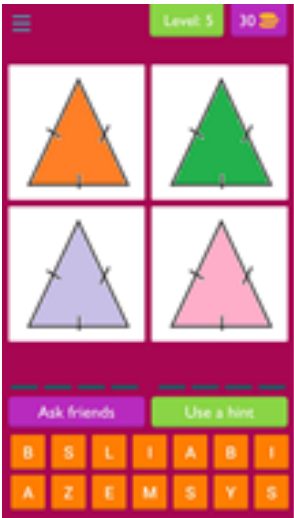


Figure 34. Share Screen Game Level 5 display

Level 6

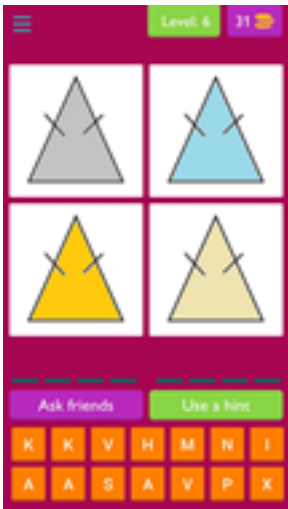


Figure 35. Share Screen Game Level 6 display

Level 7

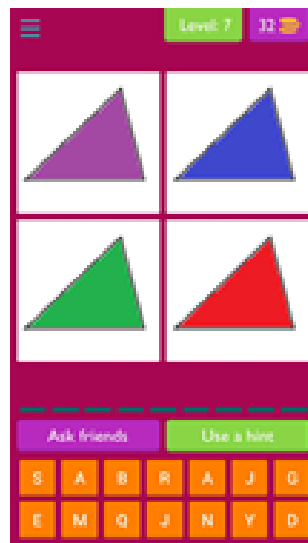


Figure 36. Share Screen Game Level 7 display

- 8) The teacher invites students to correct their respective answers
Level 1 Answers



Figure 37. Share Screen Display of Level 1 Game Answers

Level 2 Answers



Figure 38. Share Screen Display of Level 2 Game Answers

Level 3 Answers

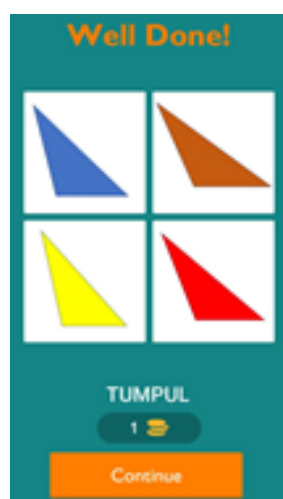


Figure 39. Share Screen Display of Level 3 Game Answers

Level 4 Answers

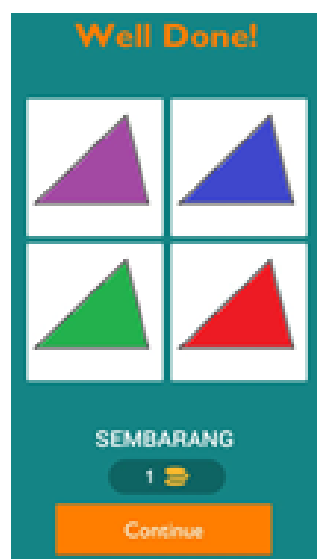


Figure 40. Share Screen Display of Level 4 Game Answers

Level 5 Answers



Figure 41. Share Screen of Level 5 Game Answers

Level 6 Answers



Figure 42. Share Screen Display of Level 6 Game Answers

Level 7 Answers



Figure 43. Share Screen Display of Level 7 Game Answers

- 9) The teacher invites students to conclude the material
- 10) The teacher sends the android game Apk file to be installed on their respective cellphones
- 11) The teacher directs students to study independently at home by returning to playing android games to better understand the material on the types of triangles

CONCLUSION

Android games that are broadcast by teachers through share screens on Google Meet, are media that help online learning become more interesting. In making android games through Quickappninja, teachers will be more flexible in developing games according to their needs and

subject matter. Apart from being delivered classically through Google Meet, this Android game can also be used independently for students as a medium of learning at home, as well as repetition of material for students so that they can better understand math subject matter.

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