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The Development of a Mobile Game while Exploring Traditional Malaysian Cuisine

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Abstract

This project introduces a mobile game designed to popularize traditional Malaysian cuisine globally using WebGL platform. The game features a main menu with three buttons: Start, Level, and Shop. Users begin by choosing Start or Level, leading to the first level where they serve customers within a time limit shown by a patience bar. Failure to serve in time results in no tips, while success earns coins. Players must earn the coin goal in three minutes to unlock the next of sixteen levels, providing ongoing challenges. Coins can be spent on decorations to improve customer satisfaction and tips. Presented in English, the game aims to make Malaysian food more widely recognized, following the Game Development Life Cycle methodology for systematic development.

1. Introduction

Food plays a paramount role in the tourism sector, acting as a compelling attraction for travelers seeking a sense of place [1]. Travelers are drawn to destinations that promise unique and extraordinary culinary experiences, offering a taste of different food cultures that they may not encounter in their home countries. Often, a tourism destination's popularity can be attributed, in part, to the exceptional cuisines it offers to tourists [1].

Malaysia is well-known as a food heaven celebrated for its wide range of local and international cuisines. Nevertheless, despite this culinary abundance, the significance of Malaysian heritage food (MHF) in shaping cultural values is still developing [1]. Interestingly, many tourists tend to view Malaysia primarily as a country with breathtaking landscapes, scenery, and stunning beaches, often missing out on the unique and culturally rich food experiences that the country has to offer [1].

This interesting contradiction raises questions about the overlooked cultural importance of traditional Malaysian food in the tourism industry. While Malaysia has become a popular travel destination, especially for food lovers, there is still a chance to make its unique culinary heritage more culturally significant [1]. By doing this, Malaysia can enhance the experiences of tourists and not just be known for its natural beauty but also for its rich culinary traditions waiting to be discovered.

However, there are a lot more fun ways to further the experience and knowledge about Malaysian cuisine which is through mobile games instead of physical books. A study involving nearly 2,000 children found that those who played video games for three hours or more every day showed better cognitive skills in tests measuring impulse control and working memory, compared to children who did not lay video games previously. This research, featured in the JAMA Network Open, analyzed data from the ongoing Adolescent Brain Cognitive Development (ABCD) Study, which supported by the National Institute on Drug Abuse (NIDA) and various other institutions associated with the National Institutes of Healthy [2].

This mobile game would be named as “Cafe Adventure Malaysian Food” and in this game user are able to run their cafe shop in the morning cozy vibe. This game would be developed in 2D pixel type of game that include pixel

art. The traditional food would be list in the menu of the cafe like 'nasi lemak', 'sate', 'kuih-muih' and a lot more food in the future (level).

There would be sixteen level and every time user pass one season, there would be new menu added from the customer. Each level has their own difficulties like the customer are going to be more crowded. There would also be a coffee machine that give more dynamic in this game. Also, there would be moon cake that has a power to increase the patient of waiting that would be called as patient bar from the customer. In a nutshell this game would have a diversity in terms nationality that will include all Malaysian people which are Malay, Chinese and Indian.

In the following section, this paper will explain the related work of this project, followed by methodology, how the production is going to be, testing, discussion, and conclusion. It will explain all the detail about this particular topic to show the journey of this project, "Café Adventure" for youngster.

2. Related Work

The thorough literature reviews carried out for the project "The Development of a Mobile Game while Exploring Traditional Malaysian Cuisine" are covered in detail in this chapter. A comprehensive review of the research domain is given in Section 2.1, with a focus on the different types of traditional foods found in Malaysia. Going from here to Section 2.2, a thorough explanation of mobile technologies used in project development is given. The next section, 2.3, explores the complex subject of video games and explains how the concept to include traditional Malaysian cuisine as a main theme came about. Last topic will compare all the related work in table form.

2.1 Malaysian Traditional Food

Malaysia's traditional food offers a delicious and varied culinary environment through an intriguing combination of Malay, Chinese, and Indian culinary influences. Despite being widely acknowledged, there is a gap in commercialization, particularly in the hotel industry [3]. The local experience is defined by community cooking, traditional Malay dining customs, and a strong emphasis on rice. Traditional meals in Malaysia have been given distinctive twists by the development of Chinese and Indian cuisines. The unique flavours, cooking methods, and cultural narratives of Malaysia's culinary artwork continue to draw food collectors in despite the difficulties encountered when combining traditional cuisine into enhance corporations. [4]

2.2 Mobile application

Mobile applications have significantly changed the technological landscape. These multipurpose instruments have become a vital component of our everyday existence, providing an abundance of features on tablets, PCs, and smartphones. Mobile applications are essential tools that cut over borders and offer rapid access to a variety of services, including productivity, entertainment, and communication [5]. Our digital experiences are now completely shaped by this dynamic and quickly growing space, which has an impact on everything from social networking and gaming to health and finances [5]. Mobile applications are a rapidly developing area of information and communication technology that serve a wide range of users with intuitive solutions that are available on several platforms and devices.

2.3 Mobile Games

Mobile games are a major force in modern digital entertainment, engaging a wide range of people worldwide. The progression of mobile games from basic entertainment to elaborate and captivating experiences has influenced how people interact with technology [6]. These games serve as tools for social interaction, skill development, and even education in addition to being enjoyable and relaxing times. Future mobile games could offer even more creative and captivating experiences as technology develops, further integrating these virtual entertainments into our everyday lives [6]. The relevance of mobile games as a global trend and a dynamic form of interactive entertainment is highlighted by their widespread influence.

2.4 Analysis of current Application

The comparison Table 1 highlights distinct features and attributes of three cooking-related mobile games, including Cooking Dash™, Restaurant Dash Cooking Games, Kitchen Scramble: Cooking Game, and the proposed "Cafe Adventure". Cooking Dash™ stands out for its realistic restaurant management and dynamic gameplay, while Restaurant Dash lacks organization and key features. Kitchen Scramble offers a culinary experience but is limited in food variety and suffers from low-quality graphics.

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A fascinating smartphone game that was created on June 16, 2015, Cooking Dash™ gives users a realistic restaurant management experience [7]. Figure 1 (a) show Cooking Dash™ consists of a main page. The main goal is to manage food orders effectively and make sure customers receive their orders on schedule.

Restaurant Dash Cooking Games entered the mobile gaming scene on April 3, 2010, presenting a gameplay experience strikingly similar to Cooking Dash™ [8]. The game has an incomplete feel to it, lacking the polish and quality one would expect from a finished product. It encounters difficulties in providing a smooth and captivating gaming experience.

Launched on July 31, 2014, Kitchen Scramble Cooking Game offers users a culinary experience in which they can assume the role of a chef, preparing and serving food to virtual customers [9]. Early on, it's clear that there is not much variation in the food alternatives available as the first few stages only offer two meal types of which are potatoes and eggs refer to Figures 1 (b). The game's graphics are poor with low-resolution images as you can see in Figure 1(c) that distract from the overall design.

In contrast, the "Cafe Adventure" project aims to introduce Malaysian traditional cuisine globally through an interactive game approach, targeting a diverse age group. It leverages game components, while introducing levels with challenges, and employs pixel art for 2D objects. Currently in development, the proposed game seeks to address weaknesses seen in other games, emphasizing cultural education and inclusivity.

(a) **(b)** **(c)**

Fig. 1 *The screenshots of (a) Cooking Dash™; (b) Ann's Restaurant; (c) Kitchen Scramble Cooking Game*

Table 1 *Comparison between reviewed applications and proposed applications*

Application / Features	Cooking Dash™	Restaurant Dash Cooking Games	Kitchen Scramble: Cooking Game	Cafe Adventure Malaysian Food (proposed)
Gameplay Experience	Realistic restaurant management	Restaurant management	Assume the role of a chef	Interactive game components
Key Features	Dynamic gameplay, season and level selection	Similar gameplay structure	Culinary experience with limited food variety	Malaysian traditional food, interactive learning
Strengths	Realistic management, dynamic gameplay	Similar gameplay	Culinary experience	Targets diverse age group, introduces Malaysian traditional food
Weaknesses	In-app purchases affecting gameplay	Disorganized design, lacks features	Limited food variety, poor graphics quality	Does not have tutorial
Graphics Quality	High-quality graphics	Low-quality graphics	Low-quality graphics	High-quality graphics
Object	2D object	2D object	2D object	2D pixel art object
Levels	Multiple levels with progression	Levels not clearly defined, lacks level selection	Levels with limited food variety	Levels and game components
Tutorial	Has a clear tutorial	Confusing tutorial	Has to many tutorial	Has a clear and direct game.

The Table 1 provides a comparative overview of four applications: Cooking Dash™, Restaurant Dash Cooking Games, Kitchen Scramble: Cooking Game, and the developed Cafe Adventure. Cooking Dash™ stands out for its realistic restaurant management experience and dynamic gameplay, while Restaurant Dash lacks organization and key features. Kitchen Scramble offers a culinary experience with limited food variety and poor graphics. In contrast, the Cafe Adventure project focuses on Malaysian's cuisine element, introducing Malaysian traditional cuisine globally through a pixel art-driven, high-quality graphics interface with game components. It addresses weaknesses observed in other games and targets a diverse age group with a direct game.

3. Methodology

The game development life cycle (GDLC) is a guideline that covers the game development process [10]. To build a complete game on all platforms, GDLC focuses on standard streamlined engineering principles. The game development process can be complex, that require a collaborative team to create a game for multiple platforms. Rido Ramadan's GDLC in Figure 2 was chosen because it provides steps and phases of the game development process, allows for a high degree of flexibility during game development, and addresses the quality criteria for each prototype stage. Rido Ramadan's GDLC has been modified to meet the needs of this project, so a modified version of Rido Ramadan's GDLC is used.

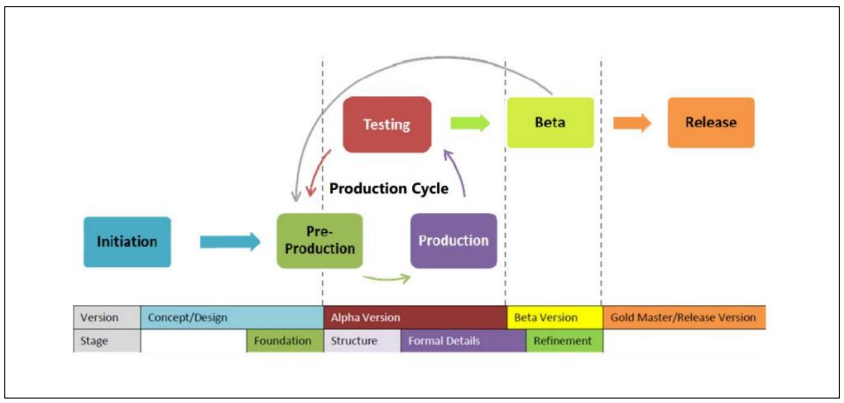

Fig. 2 *Rido Ramadan's GDLC [10]*

3.1 Initiation Phase

In the initiation phase of the GDLC methodology, information is acquired through interviews and questionnaires. The interview involved discussions with Puan Wan Kalson Wan Yusoff, an expert in Malaysian traditional food, who operates her own morning stall. The interview transcript is provided in Appendix A. This session contributed to the user analysis, outlining essential design modifications for the game. Table 2 user analysis table is created based on the input from the interview in the appendix A. The minimal hardware and software requirements are displayed for creating or using the suggested application. The hardware and software utilized in the creation of this application are all listed in Table 3 and 4 respectively. Functional requirements frequently describe how a system operates in specific situations. The functional requirements for this application are presented in Table 5. Non-functional requirements or NFR evaluate the software system according on standards that are crucial to its success but are not functional, like portability, security, usability, and responsiveness. The non-functional needs are broken down into five categories and are displayed in Table 6.

Table 2 *User Analysis*

Stakeholder category	Role in product	Design implication	Action needed
Subject Matter Expertise (SME)	Content consultant Expert in designing the level and Traditional food subject	Based on the interview, Cozy vibe, and aesthetic game interface which suitable for Malaysia food.	• Use night light and use particle system in the background. • Buttons design should be consistent in size and theme

Table 2 *(cont.)*

	Easy to navigate	• Always have buttons to let the user navigate back and to the next page
	Multimedia elements	• Use more animation and audio to attract children's attention. • Can include a story with voice-over to make the application more interesting
	Based on the interview, The level classification is made based on from easy to hard in preparing the food	• Create the level based on choice food.

Table 3 *Hardware requirements*

Hardware	Specifications
Laptop	• MSI GF63 Thin 10SC
Central Processing Unit	• Intel(R) Core(TM) i5-10500H CPU @ 2.50GHz 2.50 GHz
Random Access Memory (RAM)	• 8.00 GB
Graphics Processing Unit (GPU)	• Nvidia GeForce GTX
Operating System	• Window 11

Table 4 *Software requirements*

Software	Specifications
Unity 3.4.1	• For the application development.
Microsoft Word	• For application's documentation.
Visual Studio 2019	• For application's scripting.
ClickUp	• For project's Gantt Chart
Pixilart	• For pixel artwork
Pixelated	• For editing the image
Canva	• To create button, icon and other UI

Table 5 *Functional requirement*

Functional Requirement	Module	Description
User Interaction	Homepage	• Homepage section should allow user to interact with several main functional buttons which is start button, level, and shop button.
	Main menu	• The system should provide users with the ability to go to the building selection. • The system should provide users with the ability to exit the game
	Level selection menu	• The system should provide users with the ability to choose the levels. • The system should provide users with unlock system. • The system should provide users with the ability to go back to the main menu

Table 5 *(cont.)*

Functional Requirement	Module	Description
	Gameplay module	• The system should provide users with the ability to prepare the food according to the customer. • The system should provide users with the ability to cook the dishes. • The system should provide users with the ability to pause the game and continue the game. • The system should provide users with the ability to go to the next level after completing a level
	Pause menu	• The system should provide users with the ability to resume the gameplay. • The system should provide users with the ability to go back to the main menu. • The system should provide users with the ability to go back to the level selection page
	Level completed menu	• The systems should provide the user with the ability to go to the next level. • The systems should provide users with the ability to go back to the level selection

Table 6 *Non-functional requirements*

Non-functional requirements	Description
Performance	• Any interaction between the user and the system should not exceed two seconds. • The time to load each level should not be more than five seconds. • The application shall operate without the need for the internet.
Operational	• The application shall be able to operate on any model of PC
Cultural	• The application shall be developed in English.
Legal	• User cannot modify any information displayed in the application
Usability	• The game shall be easy to understand and user-friendly

3.2 Pre-Production Phase

The application will be developed based on the structure analyzation. An application's navigation structure and flowchart explain the arrangement and connectivity between its several interfaces. The application's navigation structure and flowchart are displayed in Figure 3 and 4 respectively. The application's main menu will appear when the user launches it. The user has the option to start the game immediately, go through level selection, and shopping using the coin that they gain after finish the one level. Upon selecting the "start" button, the user will navigate to café where the gameplay would start. User can play along with the game like drag the ingredient and drop it onto the plate to serve it to the customer. User can also pause the game and resume or even go exit the game. Based on Figure 3 and 4, the detail navigation structure and flowchart would be displayed for better understanding. If user choose the level button, it will bring them to the level selection where it has 16 level in total. These levels are unlocked until user pass level by level. Furthermore, the shop button will navigate user to the shopping center where user can shop the additional item like flower that act as decoration or even a radio. These items are helpful to increasing the tax payment that the customer will pay during the gameplay.

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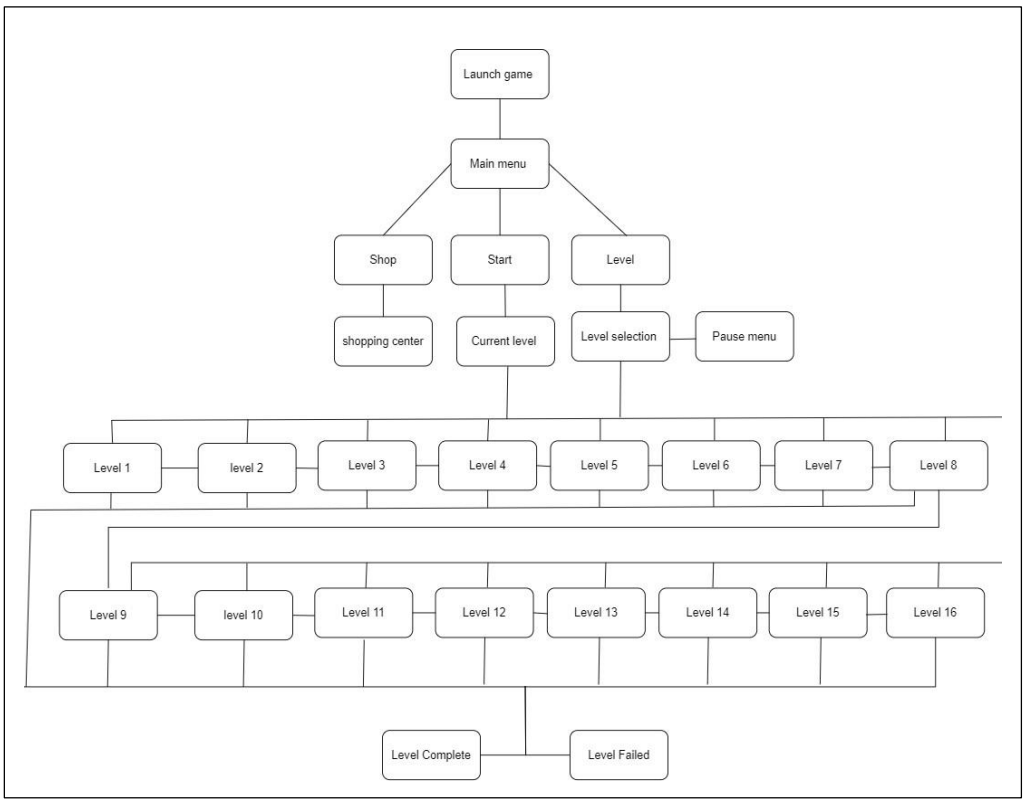

Fig. 3 *Navigation structure*

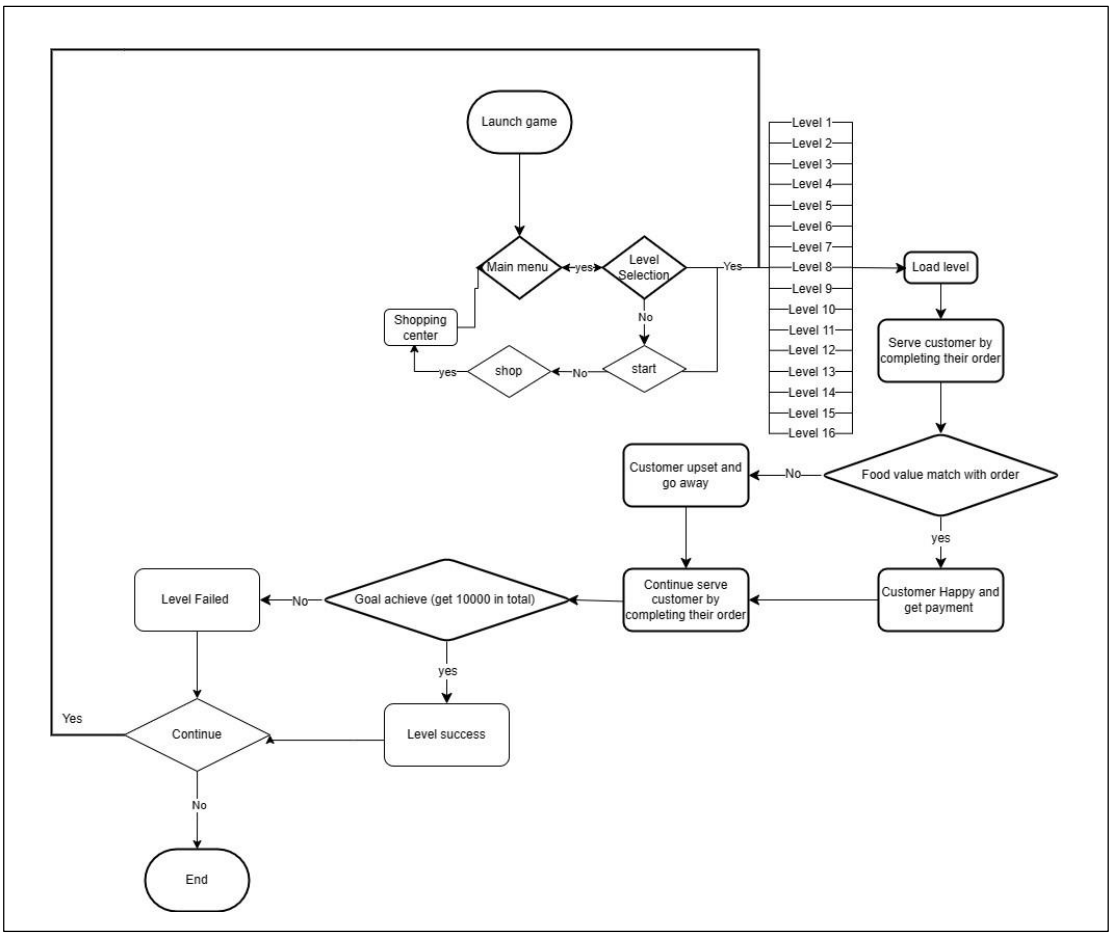

Fig. 4 *Flowchart*

A User interface design is an illustration of the mobile game's flow, sequence by sequence and sequence by scene. Because it helps put the application together in accordance with the storyboard, this can greatly simplify the production process. All the application's possible scenes and interfaces are displayed in Table 7. The table provides an explanation in detail of each interface and scene, including the possible user interactions and their outcomes. This will help better understanding, prevent any confusion, and provide the consistency when the production happens.

Table 7 *User interface design*

User Interface Design	Description
	Main menu page for starter • User can pick between 3 choice: shop, start, and level button.
	Shopping page • This is where user can purchase their item that will boost the tips of the customer.
	Level selection page • First time user can unlock the first level of this game • User need to finish level 1 first before unlocking the next level • Total level would be sixteen
	Gameplay page • This is where user will serve customer where drag and drop happen. • User can pause the game, resume and go to main menu.
	Pause page • User can pause the game, resume and go to main menu.

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3.3 Production phase

The primary development process is contained in this production phase. The creation of assets, game development, programming, and other significant tasks required to complete this project will begin at this point. Programs like Pixilart, Visual Studio, Pixelated, Unity, will be applied in this stage. Figure 5 shows the customer several models that are created. It is created based on the modification from basic 2D pixel model that has been created from scratch. All the customer has been making up until 8 customers. These customers will be randomly appear followed by the time limit that has been set in the game event. The original colour has been changing to match with environment and the theme of this café in Figure 6. The environment will be changing level after level and overall, it has like up to 8 backgrounds in total. This background will be change randomly until the finish level. Figure 7 showed the total background that will be apart from this game.

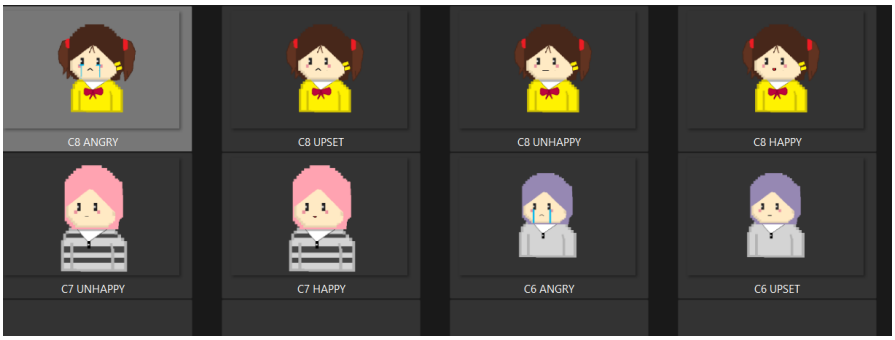

Fig. 5 *Customer emotion*

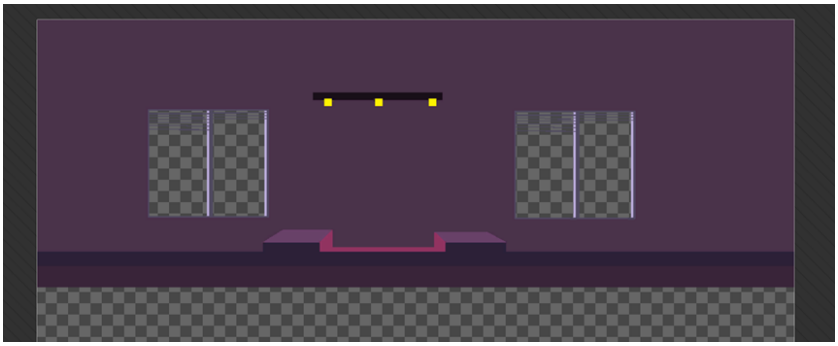

Fig. 6 *Main Background for Level 1*

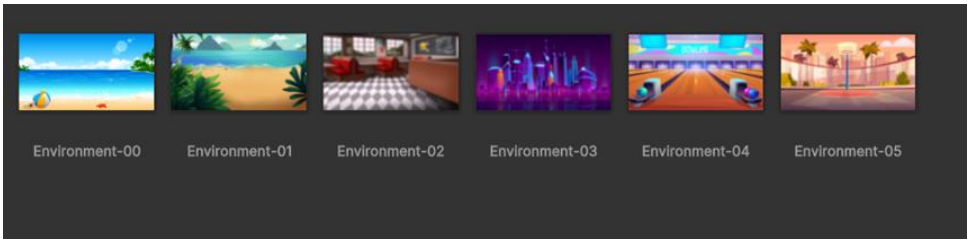

Fig. 7 *Background Material for next level*

The centerpiece of this application is the gameplay module. It contains each food interaction a player does when engaging in the game, along with additional features related to gameplay like pause, resume, and restart. In order for the user to organize and perform commands, every command function, including drag and drop commands, must be able to be added to a list of commands. A sample of code for controlling the food to drag and drop it onto the dish is shown in Figure 8.

```
void createIngredient (){
if(canCreate && !MainGameController.gameIsFinished &&
!MainGameController.deliveryQueueIsFull) {
        canCreate = false;
        itemIsInHand = true;
GameObject prod = Instantiate(ingredientsArray[factoryID - 1], transform.position +
new Vector3(0,0, Zoffset), Quaternion.Euler(90, 180, 0)) as GameObject;
prod.name = ingredientsArray[factoryID - 1].name;
prod.tag = "deliveryQueueItem";
prod.GetComponent<MeshCollider>().enabled = false;
prod.GetComponent<ProductMover>().factoryID = factoryID;
prod.GetComponent<ProductMover>().needsProcess = false;
prod.transform.localScale = new Vector3(0.17f, 0.01f, 0.135f); //hardcoded scale
value. change with caution!
                        playSfx(itemPick);
                        StartCoroutine(reactivate());
                }
        }
```

Fig. 8 *Script snippet for createIngredient () function*

Since cooking raw meat is a part of the gameplay, certain command addition functions that are suited for culinary operations must be implemented. When connected to the appropriate cooking stove, these features make sure that the right commands are added. The code sample that is provided, which is similar to Figure 9, shows how to cook raw meat like "sate daging". This tactic makes sure that every cooking is efficiently work with the green and red light as a guide for the user.

```
    void createRawIngredient (){
    if(canCreate && !MainGameController.gameIsFinished) {
      canCreate = false;
      itemIsInHand = true;
      GameObject prod = Instantiate(ingredientsArray[factoryID - 1], transform.position + new
Vector3(0,0, Zoffset), Quaternion.Euler(90, 180, 0)) as GameObject;
      prod.name = ingredientsArray[factoryID - 1].name + "-RAW";
      prod.tag = "rawIngredient";
      //prod.GetComponent<MeshCollider>().enabled = false;
      prod.GetComponent<ProductMover>().factoryID = factoryID;
      prod.GetComponent<ProductMover>().needsProcess = true;
      prod.GetComponent<ProductMover>().processorTag = processorTag;
      prod.transform.localScale = new Vector3(0.17f, 0.01f, 0.135f); //hardcoded scale value. change
with caution!
      playSfx(itemPick);
      StartCoroutine(reactivate());
    }
  }
```

Fig. 9 *Script snippet for createRawIngredient () function*

Figure 10 shows a detailed view at the complete methodology used to determine the order's ultimate price. This computation accounts for a number of variables, including the kinds and amounts of the things that were ordered, any tips or promotions that may be relevant, and any other costs or taxes. The figure demonstrates the intensive processes that were taken to get the precise final price, guaranteeing the transaction's fairness and openness. Moreover, the animation that goes with this process shows the customer leaving the cafe after the transaction is complete. A genuine touch is added to the entire experience when the customer appears getting up from their seat and leaving the cafe with smooth, genuine movements.

```
    void settle()
  {
    moodIndex = 2;  //make him/her happy :)
    //give cash, money, bonus, etc, here.
    float leaveTime = Time.time;
    int remainedPatienceBonus = (int)Mathf.Round(customerPatience - (leaveTime - creationTime));
    //if we have purchased additional items for our restaurant, we should receive more tips
    int tips = 0;
    if (PlayerPrefs.GetInt("shopItem-1") == 1) tips += 2;   //if we have seats
    if (PlayerPrefs.GetInt("shopItem-2") == 1) tips += 3;   //if we have music player
    if (PlayerPrefs.GetInt("shopItem-3") == 1) tips += 5;   //if we have flowers
    int sideReqPrice = 0;
    int mainOrderPrice = 0;
    //if customer is only asking for a drink with no main order
    if (isOnlyAskingForDrink)
    {
      mainOrderPrice = 0;
      sideReqPrice =
availableSideReqs[customerSideReq].GetComponent<SideRequestMover>().sideReqPrice;
    } else{
      //calculate the price of main order
      mainOrderPrice = availableProducts[customerNeeds].GetComponent<ProductManager>().price;
```

Fig. 10 *Code Snippet for settle () function*

3.4 Testing Phase

The testing phase will see Café Adventure few tests session such as food movement, time constraint, and others. The testing has been conducted inside the Unity platform to make sure it is working. The project growth will be based on the result of the testing session, whether it needed to recede towards the production cycle again or it can progress to the beta testing phase. In software development, alpha and beta testing are crucial stages for finding and fixing defects prior to the final release. To find bugs and enhance functionality, developers and a small group of internal users conduct alpha testing internally. In contrast, beta testing is done in a production setting with actual users outside the company to get their input and make sure the program functions properly under real-world circumstances. The beta testing is planned to be picked from UTHM foreigner student as the feedback can be assessed directly, helping the development process.

3.5 Beta Testing Phase

The purpose of beta testing is to gather 17 direct feedback from external end-users, who are not part of the development process, to obtain their valuable insights and opinions. Based on the Café Adventure target user which is 12 to 17 years old, a beta testing session has been executed and the results are evaluated in Section 4. The testing involves foreign children, and their feedback has been recorded through Google Form questionnaire attached in Appendix B.

3.7 Release Phase

The Release Phase marks the concluding stage of the GDLC model, where the the web-based game Cafe Adventure has been skilfully developed. The game is created using the Unity Game Engine and converted into the link format. Subsequently, WebGL file is publish in unity play. WebGL has been chosen as a platform for this game because of so many important reasons. One of it is because this game wants to include everyone without having to download it as not all people have the good technology like a large memory space to download this. Hence, user can directly try and play this through a link.

4. Results and Discussion

Functional testing is a sort of testing that aims to determine whether each application feature functions in accordance with the program requirements. Each function is compared to the corresponding requirement to see if its output matches the end user's expectations. The testing is carried out by supplying sample inputs, collecting resulting outputs, and ensuring that the actual outputs match the expected outputs. Table 8 shows the sample input, expected output and resulting output for functional testing.

Table 8 *Functional Testing Table*

Sample Input	Expected output	Resulting output
Users press the start button	User navigate to café shop and resume the game.	User navigate to café shop and resume the game.
User press the level buttton	User navigate to level selection and resume the game.	User navigate to level selection and resume the game.
User press shop button	Navugate user to shop interface.	Navugate user to shop interface.
User press the pause button	Enable to user to pause the game.	Enable to user to pause the game.
User press the level selection button	Navigate user to those level that their selected.	Navigate user to those level that their selected.
User press restart button on pause panel	User will be able to restart the whoole game.	User will be able to restart the whoole game.
User press buy button	The additional item would be added in the café shop.	The additional item would be added in the café shop.
Users drag and drop each ingredient in the café shop.	User can drag the ingredient and drop it on to the plate to serve to the customer	User can drag the ingredient and drop it on to the plate to serve to the customer
User can drag the coffee cup to the coffee machine	User can fill the cup with the coffee machine smoothly	User can fill the cup with the coffee machine smoothly
User can drag the ready food on the plate to the garbage	User can remove the food from the plate if making a mistake with the order	User can remove the food from the plate if making a mistake with the order
Users drag cupcake to the customer	User can refill the patient bar by giving the cupcake	User can refill the patient bar by giving the cupcake
Users give wrong food order to the customer	User will see the emotion change from the customer to give bad feedback of their action	User will see the emotion change from the customer to give bad feedback of their action

Based on Figure 11, there are ten question in total with seventeen respondents. Firstly, the first question is whether this game makes user feel enjoy and fun when they played it. Most of the user give positive feedback which there are fourteen respondents (82.4%) strongly agreed and three respondents (17.6%) agreed. Next, second questions which ask user whether The game performance is really good in every perspective. There is only two respondent (11.8%) agree about this question, while four respondents (23.5%) being neutral about it and eleven respondents (64.7%) are strongly agree. Then, third question is about whether this game makes the traditional food felt presences in game world. Most of the respond are positive which are thirteen respondents (76.5%) strongly agreed and two respondents (11.8%) agreed about the opportunity that this game have. There is only two respondent (11.8%) feel neutral about this question. After that, the fourth question ask user whether this game has so much potential to be part of worldwide game as it bring Malaysia's element into it.. There are three respondents (17.6%) agree and twelve (70.6%) strongly agree about this statement. There are two respondents (11.8%) feel neutral about this statement. In addition, the fifth question ask user if they felt that the game has a complete function that makes it playful. Eleven respondents (64.7%) strongly agree while only two respondents (11.8%) agree. Remaining four respondents (23.5%) feel neutral about this statement.

Furthermore, sixth question is about if the game is aesthetically beautiful and tally with the Malaysia's vibe. There are eleven respondents (64.7%) strongly agreed and four respondents (23.5%) agreed. The remaining respondent which are two respondent (11.8%) remain neutral about these questions. Next, seventh questions is

about whether this game can educate user and makes them know more about Malaysia's dishes. Nearly all respondents which are thirteen respondents (76.5%) strongly agreed while two respondents (11.8%) agreed. The remaining two respondent remain neutral to this statement. The eighth question is asking user whether this game makes user feels immersive with the environment and playful sound . There are twelve respondents (70.6%) strongly agree while three respondents (17.6%) agree. Two respondents (11.8%) feel neutral. The ninth question ask about the without tutorial, user can already tell how to play this as it has a lot of thing in commons. There are twelve respondents (70.6%) strongly agree and three respondents (17.6%) agree. Remaining two respondents (11.8%) feels neutral about the statement. Lastly, the tenth question ask user if they thought the level of this games make them feel more addict to find the output and the conclusion of this game. There are eleven respondents (64.7%) strongly agree while four respondents agree about this statement. The remaining two respondents feel neutral about this statement. After collecting all the response, the System Usability Scale (SUS) mark can be calculated. The score is shown in Figure 11 shows the bar chart of the summary of the user acceptance testing.

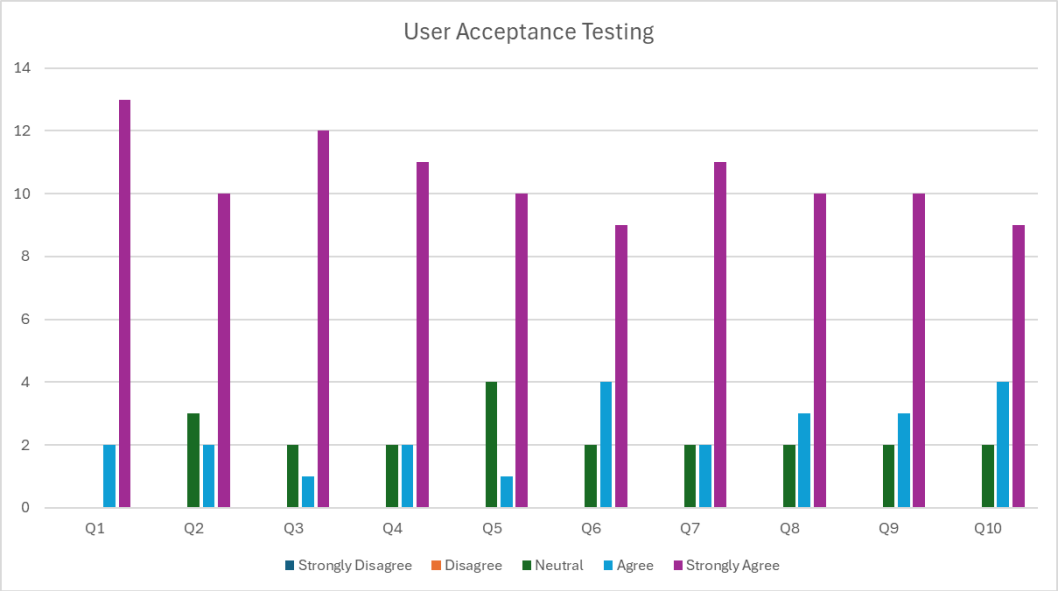

Fig. 11 *Result of user acceptance testing*

Table 9 represents the results of a User Acceptance Testing (UAT) study conducted with 17 users. The study involved responses to 10 questions related to the Technology Acceptance Model (TAM), assessing variables such as Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), Behavioral Intention to Use (BI), Actual Use (AU), and External Variables (EV). The table displays the aggregated or individual responses across these variables, providing insights into user perceptions, attitudes, intentions, and actual usage of the technology being tested.

Table 9 *User Acceptance Testing Table*

(TAM) Variables	Description	Question
Perceived Ease of Use (PEOU)	This is a measure of how much users feel that using the technology would be effortless or simple.	Q5(This game has a complete function that makes it playful.) Q9(I believe that without the tutorial I can already know how to play this as has a lot of thing in commons.)
Perceived Usefulness (PU):	This discusses to the degree to which users think that utilizing the technology will improve their output or productivity.	Q2(The game performance is really good in every perspective) Q7(This game can educate myself and makes me know more about Malaysia's dishes.)
Attitude Toward Using (ATU	This is the general attitude, whether favorable or unfavorable, that a user has toward using the technology.	Q4(This game has so much potential to be part of worldwide game as it bring Malaysia's element into it.)
Behavioral Intention to Use (BI	This speaks to the possibility or intention of the user to employ the technology going forward.	Q1(This game makes me feel enjoy and fun when I played this.) Q6(The game is aesthetically beautiful and tally with the Malaysia's vibe.)

Table 9 *(cont.)*

(TAM) Variables	Description	Question
Actual Use (AU):	This evaluates how users really use the technology once they have adopted it.	Q8(This game makes me feels immersive with the environment and playful sound) Q10(The level of this games makes me feel more addict to find the output and the conclusion of this game.)
External Variables (EV)	These include extraneous elements like training, assistance, organizational rules, and outside influences that can affect users' perceptions and intentions but are not included in the TAM model.	Q3(This game makes the traditional food felt presences in game world)

5. Conclusion

In conclusion, the development of the web-based game Cafe Adventure has been a successful endeavour in this paper, by achieving all the main objectives outlined at the project's inception. The game's modules have been seamlessly integrated into the Unity game engine, meeting the specified timeframe and functional requirements. The positive feedback from user acceptance testing, with Technology Acceptance Model (TAM) indicates a high level of satisfaction with the game's usability, performance, and overall experience. Although a small number of users provided negative feedback, these insights offer valuable opportunities for future enhancements. Looking ahead, the game holds significant potential for further improvement and expansion. Addressing minor bugs and incorporating suggested features such as a comprehensive tutorial, customizable sound settings, and diverse cultural elements will enhance user experience and broaden the game's appeal. By continuously refining the gameplay and incorporating unique aspects of Malaysian culture, Cafe Adventure can evolve into a more engaging, educational, and inclusive platform, solidifying its success and popularity among users both within and outside Malaysia.

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On end note, the authors would like to take the opportunity to express countless gratitude to Faculty of Science Computer and Information Technology and University of Tun Hussein Onn Malaysia for supporting throughout this project development.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

This journal requires that all authors take public responsibility for the content of the work submitted for review. The contributions of all authors must be described in the following manner:

The authors confirm contribution to the paper as follows: ***study conception and design:*** *Siti Zulaikha, Norhanifah;* ***data collection:*** *Siti Zulaikha, Norhanifah;* ***analysis and interpretation of results:*** *Siti Zulaikha, Norhanifah;* ***draft manuscript preparation:*** *Siti Zulaikha, Norhanifah. All authors reviewed the results and approved the final version of the manuscript.*

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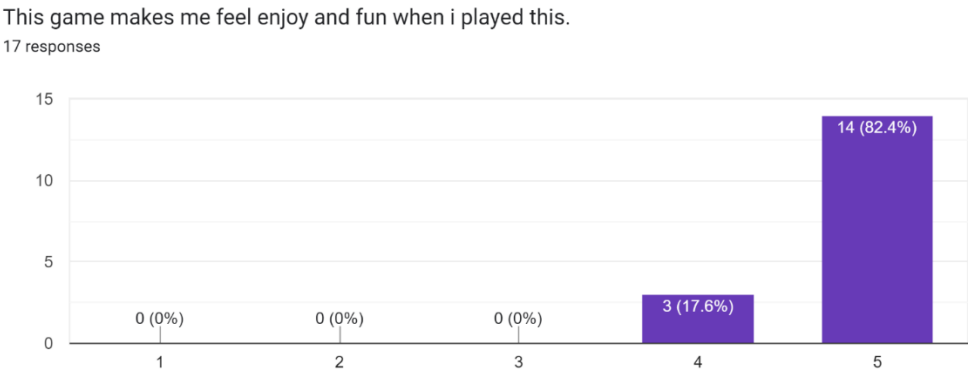
Appendix A

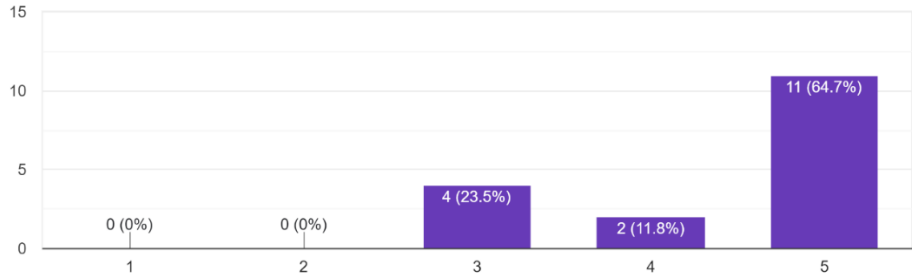
Q:Can you list me top 9 dishes that is popular in your stall.
A: Satay, nasi lemak, nasi kerabu, nasi ayam pedas, rojak, nasi berlauk, roti canai, rendang and laksa.
Q: What do you think the most hardest food to make.
A: The most hardest menu that I would put on top is Rojak.
Q:Okay, now what about the easiest food?
A: Based on my experience, I really love making satay and that is easiest for me
Q: In scale 1 to 10 what would you rate Rendang in the term of cooking the food.
A: It is a 6
Q: What about Roti canai?
A: Roti canai is not that easy but if you do it for a long time I would consider it as a top 2 easy food to make.
Q: Great, now can you arrange the type of Rice menu from the very easy to very hard that started with Nasi lemak, Nasi kerabu, Nasi berlauk and Nasi ayam pedas.
A: I would put Nasi ayam pedas on top followed by Nasi lemak, Nasi berlauk and lastly is Nasi kerabu.

Appendix B



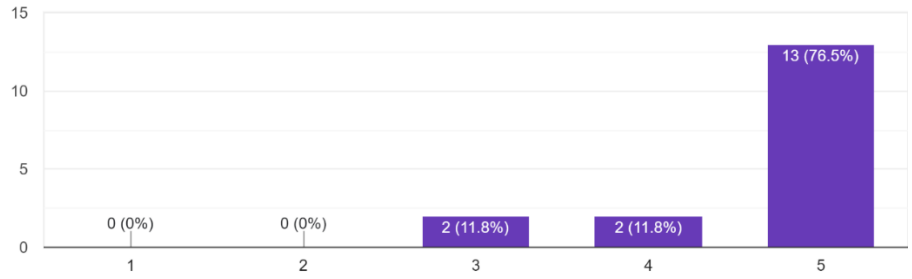
The game performance is really good in every perspective

17 responses



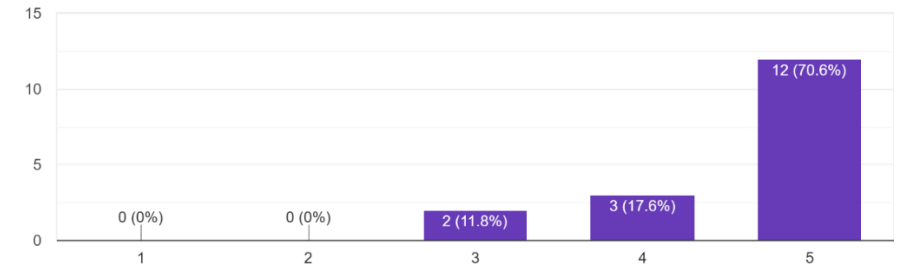
This game makes the traditional food felt presences in game world

17 responses



This game has so much potential to be part of worldwide game as it bring Malaysia's element into it.

17 responses



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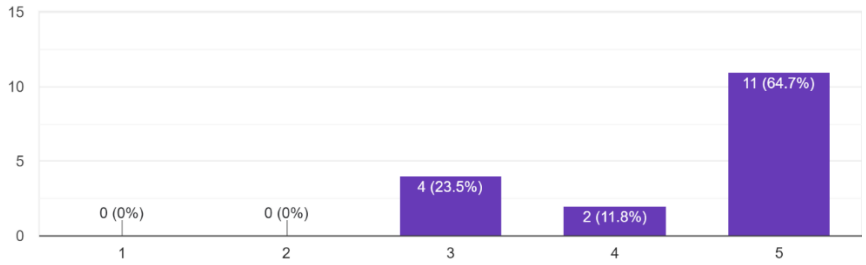
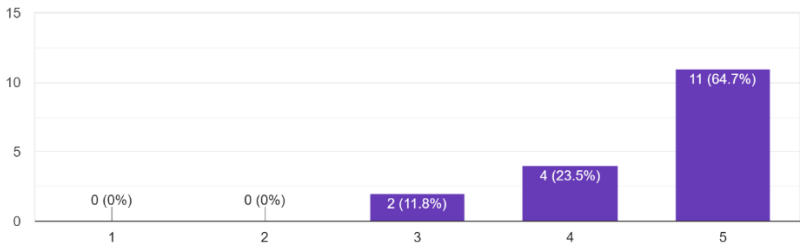
This game has a complete function that makes it playful.

17 responses



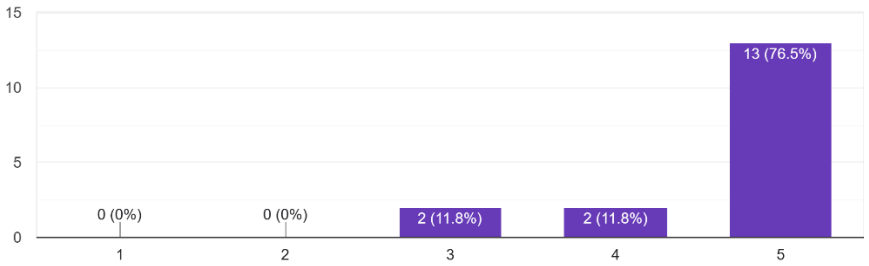
The game is aesthetically beautiful and tally with the Malaysia's vibe.

17 responses



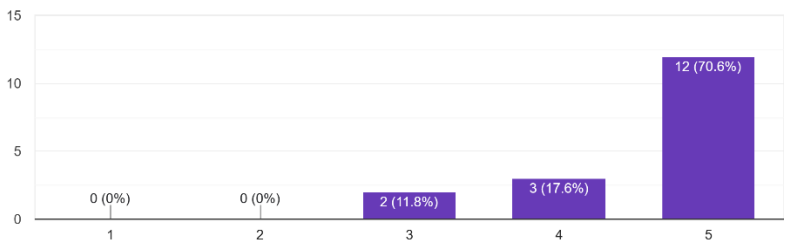
This game can educate myself and makes me know more about Malaysia's dishes.

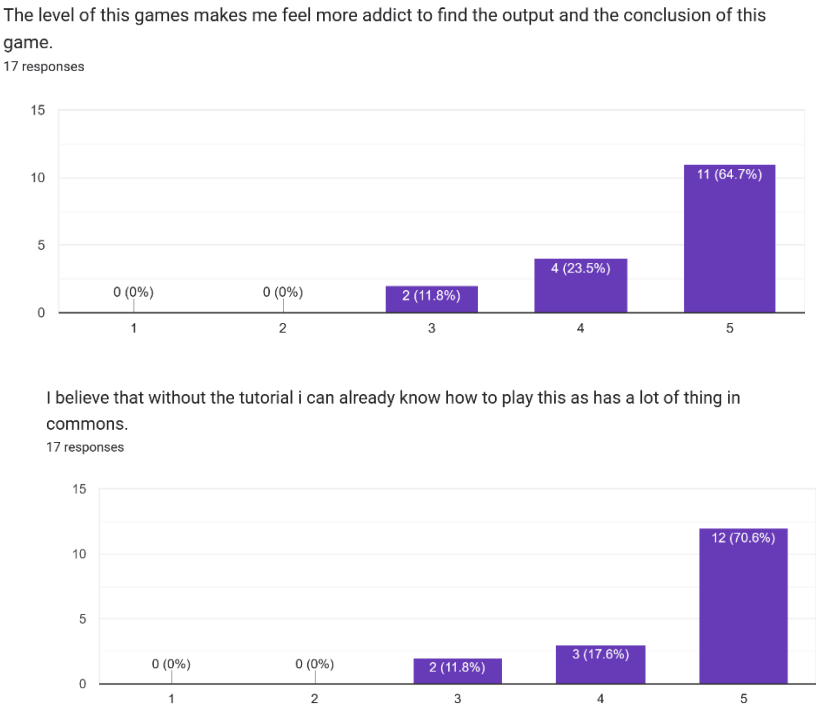
17 responses



This game makes me feels immersive with the environment and playful sound

17 responses





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