

## Tajweed's Nun Sakinah and Tanwin Mobile Guessing Game

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DOI: <https://doi.org/10.30880/mari.2022.03.01.017>

Received 30 September 2021; Accepted 20 November 2021; Available online 15 February 2022

**Abstract:** Understanding tajweed is important to all Muslims for proper solah and Quran recitation. However, memorising tajweed rules is challenging. This paper proposed a mobile guessing game to assess knowledge of the rules of nun sakinah and tanwin in a fun way, designed based on a game model, and developed using Unity and C# language. Results from testing and user feedback are generally positive. However, improvements needed in terms of control, challenge, audio, animation, and content.

**Keywords:** E-Learning, Educational Game, Guessing Game, Mobile Game, Tajweed

### 1. Introduction

The language definition of tajweed is an improvement [1] while the applied definition is giving each Quran letter its right [2]. Muslims who recite the Quran correctly will be rewarded. The hadith says 'Aishah (May Allah be pleased with her) said: The Messenger of Allah (ﷺ) said, "the one who recites Quran cleverly will be with respectful scribes and one who recites Al-Quran with great difficulties, doing the best to recite in the best way possible, will take reward twice [1]. Knowledge of tajweed is fard kifayah i.e. some Muslims have to know it, but applying it is fard 'ain i.e. required for all Muslims [1]. Hence, memorising tajweed rules is crucial so that Quran letter pronounced properly [3], thus avoid mistakes in Quran reading [1], and results in better Qur'an recitation [2]. Tajweed usually learned at school [4] from experts using methods of Talaqi, Musyafahah, drills, tatbiqu, group work, individual work, and tasmii' to supplement the Iqra' system [4]. It can also be learned through applications.

Muslims who are interested to learn tajweed are low or moderate for all age levels [5]. Children, students in the higher secondary school and about 80% of new university students who enrolled in 2015

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were not able to recite Qur'an based on tajweed [5]. Children stated that tajweed learning is tedious thus they are uninterested in learning [6]. One teacher teaches many students, so he/she cannot care for every student [1]. Material is delivered with the same teaching method for all students irrespective of various altitudes of understanding [1]. Not all learners understand with the same style of teaching, some are visual learners, others are audio learners. Because of that, different types of multimedia are highly significant to academic performance [7]. Work of computer programs to teaching tajweed are still very limited, and there is no interference from the learner, one just reads, watches, listens and searches only [1].

To help Muslims assess tajweed knowledge in a fun way, the paper proposed leveraging the ownership of smartphones and the popularity of mobile games by creating a tajweed mobile guessing game for Android users, covering the rules Nun Sakinah and Tanwin. The application can be used by all Muslims, but more suitable for young adult (18 to 25 years old) since they are more familiar with mobile games. Tajweed teachers can use the game as an alternative assessment strategy.

### 1.1 Mobile guessing game

Mobile games are popular because of the widespread adoption of mobile devices [8] useful instrument for the learning process, increasing motivation, and improving educational outcomes [9]. A mobile guessing game is about guessing the word associated with a prompt [7]. It is available on Android and iOS platforms [7]. In a guessing game, player 1 enact the prompt shown on the screen through gestures and facial expressions [7] while player 2 holds the phone with the screen directed outward toward player 1 [7]. Guessing from context is probably one of the most useful skills learners can acquire and apply both inside and outside the classroom [7].

A comparison was done between four mobile guessing games from four companies Xinora technologies, Comiscode Studio, artGS and Klikapp to extract its characteristics. The first thing that will compare is the category. For Xinora technologies and artGS, they used a simple grid layout and each grid displays a category. Cosmicode Studio in turn used a vertical grid layout and each grid display a category while Klikapp used a grid layout that each of the grid display categories. Secondly is how to play games. For Xinora Technologies, the button is used for the question mark symbol while the interface contains a simple one-screen instruction and the menu button for going back. After choosing the category, two buttons (back and play) will appear beside a brief explanation about what to do. For Comiscode Studio, the button only shows once after installed while interface, it shows the instruction only once after installed and before starting the game. After choosing the category, it will show a brief explanation to tilt up or down after answer or pass. For artGS, the button at setting is for tutorial while the interface shows screen instruction like animation. Lastly, for Klikapp, the button is shown after choosing the language while the interface contains the instruction that shows after choosing the language and before choosing a category. Next is the setting. For buttons, all companies share the same symbol that is gear. For game time, Xinora Technologies, Comiscode Studio and Klikapp have a same time, 60, 90, or 120 seconds per round while artGS, 20-160 seconds per round. For language, Xinora Technologies has seven, Comiscode Studio and artGS has six and Klikapp has eight as well as for play. All companies have a same mechanism. When the phone in vertical position, sensor will detect it and proceed to display the words on the screen. To guess the correct and wrong answer all companies used same way, tilt phone downward for correct answer and green screen with word "correct" will show expect Comiscode Studio the blue screen will show with word "correct" while for wrong answer, the phone needs to face upwards and red screen will appear with word "pass" expect Comiscode Studio again, word "pass" with pink screen will appear. When game ends, for Xinora Technologies display "Time is Up", menu and replay button will appear while for Comiscode Studio and artGS, just show the display "Time is Up" expect for Klikapp, displays score screen will appear. The question will display in 1 column in order and correct or incorrect symbols displayed beside question with the score.

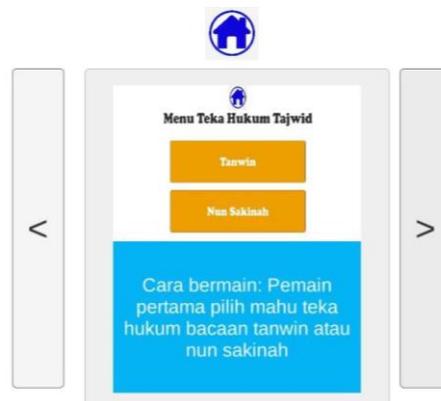
A comparison was also done between the same four mobile guessing game in terms of their interfaces. First thing that need to compare is categories. On screen, each game will show a colourful images and will show each category that can be play. When to play, each game will an instruction to place phone on forehead to make the games proceed. Then for setting, players can set the game according to what they want. When start to guess, the question will appear and players needs to tilt backward for correct answer and upward for wrong answer. Remember, the phone needs to be in a vertical position so that players will not do a mistake when playing the games. After finish guess the question, “Time is Up” screen will appear mean the game has ended. Lastly, the score. For Charades Guess the Words game, the score will appear in a purple screen with menu and replay button while for Guess Up game, a blue screen will appear with the score. For Charades App-What am I, after the game finish, players will see also a game score with black and blue screen appear while for Charades Free game, players will see a yellow score box on the screen. When game ends the mark will have displayed on the player screen. It will show how many correct and wrong answer that player score. Menu and replay button also will show on the screen. Menu button help back to categories and replay button allow play the same category.

## 2. Methodology

The game developed using Input-Process-Outcome (IPO) game model by [10] which consist of three phases; input, process, and outcome. The inputs provide knowledge and characteristics of the game, leading to processes that integrate user preferences and actions with immediate system feedback. The main emphasis is on end-of-learning, debriefing results.

### 2.1 Input

Instructional content designed to introduce learner to concepts in various ways. The game’s Title screen consists of a menu with three buttons; Tutorial, Learn, and Main. Tutorial screen (**Figure 1**) explains how to use the game application. Home button redirects to Title screen.



**Figure 1: Tutorial screen**

Learn screen (**Figure 2**) show name, example letters and example of a sentence of the rule. Speaker icon mute or play audio of example of a sentence. Navigation buttons provided. Home button redirects to the Title menu.



Figure 2: Learn screen

Play menu screen (Figure 3) give option to player whether to guess Nun Sakinah or Tanwin. Menu button redirects to Title screen. Play screen show time left on middle top, question in the top middle, Arab word in the bottom middle and the answer at the bottom.



Figure 3: Play screen

Score screen (Figure 4) shown after game ends before time is up or time is up before game ends. Right and wrong guesses separated into two columns with different colours. Score displayed at the bottom.



Figure 4: Score screen

Game characteristics may help in refinement of successful instruction theoretical formulation during developing.

Table 1: Game characteristics applied in game

Game characteristic	Description	Application in game
Rules	Clear rules, goals, feedback on progress toward goals	Number of players: 2 Player 1 task: <ul style="list-style-type: none"> <li>• Guess rule of tajweed within given time</li> <li>• When guess correct tilt phone up</li> </ul>

		<ul style="list-style-type: none"> <li>• When guess wrong or pass tilt phone down</li> </ul>
Goal		Player 2 task: <ul style="list-style-type: none"> <li>• Said words on the screen to Player 1</li> <li>• Inform Player 1 if guess correct or wrong</li> </ul> Player 1 memorizes rule of tajweed
Feedback		<ul style="list-style-type: none"> <li>• Positive sound for correct guess</li> <li>• Negative sound for wrong guess</li> <li>• Timer that counts down</li> <li>• Score</li> </ul>
Challenge	Optima level or difficulty and uncertain goal attainment	There are
Control	Active learner control	Player can pick which tajweed’s nun Sakinah or tanwin to guess

**Table 1** lists game characteristics applied in our game and how it is applied.

## 2.2 Process

Play triggers repeated cycles of user judgments (e.g., enjoyment), behaviour (game play), and feedback. The cycle represents an optimal state of performance at a task, a sense of enjoyment and control, where an individual’s skills are matched to the challenges faced. Individuals who are highly motivated are more likely to engage in, devote effort to, and persist longer at a particular activity. The process cycle is as follows:

### 2.2.1 User judgments

As players start playing, they make subjective judgments about the fun, interesting and attractive nature of the game. Engagement, enjoyment and sense of control are typically representative of these judgments. Engagement is a value of user-experience that is dependent on numerous dimensions, comprising aesthetic appeal, novelty, usability of system, the ability of the user to attend and become involved in the experience and the user’s overall evaluation of the salience the experience [11]. Enjoyment is a sense of achievement when skills correspond to the challenges of task. In the game, the joy of the player is when answering a question correctly. Sense of control provided when player 1 of the game needs to decide the following:

1. Which tajweed rule to guess.
2. Which way to tilt the phone.

### 2.2.2 User behaviour

The behaviour of the user is determined by observing the behaviour created by the player. The following are the behaviours of player 1 of the game:

1. Answer the rules of tajweed.
2. Tilt the phone up or down.
3. Guess fast or slow.

The following are the behaviours of player 2 of the game:

1. Said words on the screen to Player 1
2. Inform Player 1 if guess correct or wrong

### 2.2.3 System feedback

When player 1 correctly guesses, he should tilt up the phone and a positive sound will be heard. If player 1 guesses wrong or cannot guess, he must tilt down the phone down and a negative sound will be made. Timer displayed how much time left to guess. The game ends in two states; i) Time ends before player 1 finish all questions, ii) Player 1 finish all questions before time ends. After the game ends, score displayed at bottom of screen. The correctly answered questions listed on the left side of screen, in green colour, while incorrectly answered questions listed on the left side of screen, in red colour.

### 2.3 Debriefing

Debriefing is an overview of events in the game. Debriefing offers links to what the game represents and the real world. After the game ends, the player should ask himself whether he understands Nun Sakinah and Tanwin rules better.

### 2.4 Outcome

Learning outcomes are a clear indication of what a learner is to do, what it is to know or how good it should be attained in completion of a study unit. The learning outcome of the game divided to two types. Affective learning outcome refers to attitudes of the players. The game motivates players to learn Nun Sakinah and Tanwin based on own score of score of others. Cognitive learning outcome is engaging students in learning processes, teaching them to use their brains more effectively to make connections while learning new things. The players will gain much knowledge about tajweed specifically Nun Sakinah and Tanwin. By playing this game players can understand the tajweed must better.

## 3. Results and Discussion

The application tested by 30 (14 males and 16 females) young adult Muslim’s age 20 to 22 years old. Users will undergo a pre-test before using the application and a post-test after to see whether there is a change in performance. Both tests have the same 10 questions; a pair for each Izhar Halqi, Iqlab, Igham Maal Ghunnah, Idgham Bila Ghunnah, and Ikhfak Haqiqi. After using the application, users need to fill in a questionnaire modified from [12] and [13] divided to three parts. Part A is regarding demographics of the respondents. Part B is made up of 21 five-point Likert scale questionnaires ranging from strongly disagree to strongly agree, organised into seven sections: tension, satisfaction, game control ease, game learnability, remembrance, challenge, and efficiency. Part C offers two open-ended questions about the positive and negative aspects of the application. Tests and questionnaire developed using Google Forms. Link to tests, Android Application Package (APK), and survey given to testers via WhatsApp.

**Table 2: Comparison between pre and post-test**

Question	Pre	Post	Change
	Correct		
Izhar Halqi	22	21	-
Idgham Ma'al Ghunnah	18	19	+
Iqlab	17	18	+
Idgham Bila Ghunnah	19	22	+
Ikfa' Hakiki	14	17	+
Izhar Halqi	18	17	-
Idgham Ma'al Ghunnah	17	20	+

Iqlab	18	21	+
Ikfa' Hakiki	17	17	=
Idgham Bila Ghunnah	14	16	+

Results for pre and post-test were compared and summarized in **Table 2**.

**Table 3: Survey responses**

Question	1	2	3	4	5
<b>Tension</b>					
1. The game held my attention.	0.00	0.00	16.67	26.67	56.67
2. I put effort into playing the game.	0.00	0.00	26.67	30.00	43.33
3. I tried my best during the game.	0.00	0.00	16.67	23.33	60.00
4. I lose track of time while playing the game.	6.67	13.33	23.33	33.33	23.33
5. I felt the urge to see what was happening around me during the game.	3.33	10.00	23.33	33.33	30.00
<b>Satisfaction</b>					
6. I enjoyed playing the game, rather than something I was just doing.	3.33	6.67	10.00	33.33	46.67
7. I think I performed well in the game.	0.00	3.33	13.33	36.67	46.67
8. I felt emotionally attached to the game.	0.00	13.33	10.00	26.67	50.00
9. I enjoyed the graphics.	3.33	13.33	26.67	36.67	20.00
10. I would like to play the game again.	3.33	3.33	20.00	36.67	36.67
11. It was all right to have audience when I played the game.	3.33	0.00	23.33	30.00	43.33
<b>Easiness of game control</b>					
12. My arm was tired after playing the game.	6.67	13.33	30.00	23.33	26.67
13. I recognized the finger motion well.	3.33	6.67	30.00	36.67	23.33
14. The game good to control as I want.	3.33	3.33	30.00	36.67	26.67
15. I could see if my choice was correct or not.	3.33	3.33	16.67	26.67	50.00
<b>Learnability of game</b>					
16. It was easy to understand how to control the game.	3.33	0.00	23.33	40.00	33.33
17. I could easily remember how to control the game.	3.33	3.33	20.00	40.00	33.33
<b>Remembrance</b>					
18. The game was helpful to remember tajweed.	0.00	3.33	10.00	26.67	60.00
<b>Challenge</b>					
19. I would like to do better at the game next time.	0.00	0.00	10.00	36.67	53.33
20. I found the game challenging.	3.33	0.00	6.67	36.67	53.33
<b>Efficiency</b>					
21. It was easier to play the game as I repeat it.	0.00	0.00	20.00	43.33	36.67

- 1 – Strongly Disagree (%)
- 2 – Disagree (%)
- 3 – Neutral (%)
- 4 – Agree (%)
- 5 – Strongly Agree (%)

**Table 3** summarizes result of survey. For the question about “what do you like about the application”, a respondents give a positive comment that this game gives she or he a fun learning because it is just not a learning apps, it also includes a gaming. Another respondent say it is so nice to have a space that teach players about tajweed before play the games. A few respondents also said they gain knowledge and experience when playing the game. There was also a respondent that say it make more easily to recognized and understand more about tajweed a Nun Sakinah. Some respondents say “user interface”, “the gameplay” and “their challenge so nice” about this game. “The knowledge and the question given” also was said.

For the question about “what can be improved about the applications”, a respondents said make the controller more easily to handle and add up more difficulty and challenges to this game. A few respondents said the game flow and graphic need to be clear. “Be more interactive by using fun music or sound”, “add some animation and sound” and “add animation in graphic for each interface” are some comments that tell us to add and improve more animation and music to this game to make it feel alive. Also, there were comments that said “minimize play time and play the games online “. They also said to add more tajweed in this game. Some respondent also comments and suggest to make timer to allows the games to operate smoothly. There were also comment like “it’s good”, “all good” and “nothing” about this game. With all this comment, we gain a new chance and improvement to make this game better.

#### 4. Conclusion

This paper proposed a fun way to test knowledge of rules of tajweed’s Nun Sakinah and Tanwin through a mobile guessing game. The application can be used by tajweed educators and learners as an alternative way of teaching and learning. Comparison between pre and post tests, and feedback testers are generally positive. Future work can improve on control, challenge, audio, animation, and content.

#### Acknowledgement

The authors would like to thank the testers for their time and effort.

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