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Tarannum Smart Learning Application: Embracing the beauty of *tarranum* through multimedia technology

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ABSTRACT

This article discusses the development procedures of the Tarannum Smart Learning Application (Tarannum-SLA). It is a teaching and learning aid that has been developed for those who are interested in the *tarannum* subject. The *tarannum* is a technique to beautify and curve the tone of voice, in a certain tempo and rhythm when reading the Quran. The main aim of Tarannum-SLA is to facilitate the process of learning *tarannum*. Also, this courseware could create awareness among Muslims on the importance of the Quran. The Tarannum-SLA was developed not only to attract Muslims but also for non-Muslims who are interested to know about Islam, especially in terms of the arts of Quran recitation. Furthermore, in this courseware, we provide three language options, which are Malay, English, and Arabic for the convenience of our diverse prospective users. There are seven styles of *tarannum*, including Bayyati, Nahwand, Hijaz, Rast, Soba, Jiharkah, and Sika that are included in the Tarannum-SLA. Furthermore, to examine the ability of Tarannum-SLA to tackle the users' needs, we have conducted the usability analysis based on the diffusion of innovation model. The result indicated that most of the constructs are perceived at a high level by respondents. Thus, this evidenced the high usability of Tarannum-SLA in promoting Quranic education. Although the development of this courseware has reached the implementation stage, it still needs some future improvements, for example, to amend the verses and reciters.

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1. INTRODUCTION

The history of *tarannum* began when our beloved prophet, Muhammad S.A.W. received the revelation of the Quran in the year 610 [1], [2]. He ordered the Muslims to recite the Quran with a beautiful voice. Muslims are also advised to change their cultures, practices, and to cultivate the reading of the Quran in daily lives. The *tarannum* was supposed to attract the Pagans or *Jahiliah* Arab society at the time to fill their spiritual needs and to attract them towards the Holy Quran. Such then, the *tarannum* keeps growing until today. We can read the Quran either in slow or loud voices. Both methods are described in the narration of the Prophet, from Aisyah Umul Mukminin; When she was asked how Rasulallah read the Quran at night,

whether in a slow or loud voice, she said: *"All Rasulallah ever did, sometimes Rasulallah read in a low voice and sometimes Rasulallah read in a loud voice."*

According to Ibn Hajar, as was narrated by Al-Anbar, the *tarannum* is meant to be a gift, as people tend to listen to the melodious intonations. Melodious intonations could attract attention and calms the listeners' soul [3], [4]. Now, the *tarannum* is practiced in Malaysia by *Qari* (Quran reciter) who are specialized in this subject [4], [5]. Although *tarannum* is commonly practiced in educational institutions, it still fails to attract a large community to it. Moreover, the extent of *tarannum* exposure to Malaysians is relatively inadequate, despite the availability of related television programs like *Akademi Al-Quran* and *Mari Bertarannum*. Theoretically, Malaysian people want to learn *tarannum*, but perhaps they were so busy with daily routines. Therefore, we hope that the creation of this Tarannum Smart Learning Application (Tarannum-SLA) will be beneficial to the community, especially those who have the interest to learn *tarannum* and the Quran.

The awareness of the Quran is nurtured through the spirit of teaching and learning [6]. It can be done using the art of Quran recitation that has the ability to positively shape our culture. This is true indeed, as the Quran itself is a wonder that touches hearts and souls [7]. The Quran is recited melodiously according to the specified needs and meanings. Therefore, to facilitate the pursuit of its knowledge, we use multimedia elements to attract more people to learn *tarannum*. Tarannum-SLA is an attractive approach that we have developed. It is specifically designed for users who are keen to learn *tarannum*. The special thing about Tarannum-SLA is the step-by-step method that we embedded to learn *tarannum*. Besides, this courseware is provided with the 'First-step' category for users to learn the technique correctly. So, it will be easier for them to remember the *harakat* (punctuation), by using this step-by-step method.

Currently, there is a wide range of interactive multimedia technologies that can help people to simply learn something. This is what inspires us to create a smart learning system or courseware that could enhance and provide the Quranic content in such a way that is effective, accessible, fast, and friendly. Meanwhile, one of the challenges that we always encounter when learning the Quran and *tarannum* is time barriers to study and master the *tarannum* songs. This process is usually time-consuming, especially when we apply a traditional way to explore the seven maqams of *tarannum*. Learning *tarannum* usually needs a long period of time and requires strong dedication towards it. The *tarannum* is practical knowledge, meaning that learners need to consistently practice it to master the skill. Therefore, the Tarannum-SLA is proposed to facilitate continuous learning and practices. It is expected that this application will facilitate a deep understanding of every maqam in *tarannum*.

Technology is not uncommon in the history of Islam. It is related to various areas, such as machine architecture, military, shipping, chemicals, textiles, agriculture, and communication technology to help develop the excellence thrive of Islam since before the 16th Century [2]. The teaching of Islam is a key driver of success in the science and technology research of Muslims at the time [8]. The information processing activities such as filtering, determining and prioritizing [9], which are parts of multimedia development processes have been described by the Quran in surah number 49 that is al-Hujuraat (verse 6). The verse reminds us as Muslims, that we must investigate the source of information to determine its reliability and validity.

> "O you who believers, if there comes to you a disobedient one with information, investigate, let you harm a people out of ignorance and become, over what you have done, regretful" (Quran. Al-Hujuraat 49: 6).

The use of multimedia applications has been proved to enhance the quality of teaching and learning. Furthermore, multimedia technology can attract new generations towards Islamic education, including *tarannum* [10]. Regrettably, there is no specific courseware available thus far that focuses on the *tarannum* field. Therefore, we aim to fill the practical gap by taking this golden opportunity to create the courseware using Adobe Flash Professional CS5. The objective is to make *tarannum* learning easy and fun. At the same time, we try to combine multimedia elements and Quranic knowledge as an innovation that would be beneficial to our Muslim community. Tarannum-SLA provides a new approach to learn the Quran, particularly *tarannum* using multimedia. This approach would greatly assist learners in understanding and analyzing the correct technique in reciting the Quran. It allows them to repeat each harakat so that they fully understand the *tarannum*. The Tarannum-SLA is a combination of seven popular melodies that are recited by *Qaris* around the world. These include *Bayyati, Rast, Soba, Jiharkah, Sikah, Nahwand,* and *Hijaz.* It also provides several surahs such as Al-Humazah, Al-Quraish, An-Nasr, Al-Maun, Al-Kafirun, Al-Masad and Al-Fill to facilitate the process of learning *tarannum*.

2. RESEARCH METHOD

We used rapid application development (RAD) as a method for the Tarannum-SLA development as presented in Figure 1. This method uses minimal planning in favor of rapid prototyping, which attempts to take a user-centered view and to minimize the risk caused by requirements changing during the project [11]. The two key features of a RAD method: i) Time-limited cycles of approximately six months, at the end of which an application or partial application must be delivered. This is called time-boxing; and ii) Breaks down a large project into many smaller projects that can deliver products incrementally and enhances flexibility in terms of the development techniques used and the maintainability of the application [12]. The RAD consists of four main phases: requirement analysis, design, development, and implementation.

The Tarannum-SLA project started with the Requirement Analysis phase where the clients (potential users) have presented what they expect from the application. This includes the behaviors and features that should be provided by the Tarannum-SLA. Once the consensus on that is reached, the Design phase is executed with the repeated prototyping and testing of the application. The procedure involved continuous client involvement while testing and debugging the application. After the clients' approval, pieces of the prototype are compiled together in the Development phase. At the end of this phase, the Tarannum-SLA is almost ready to be implemented. The Implementation is the last phase in RAD where the application is tested. For usability testing, the survey method was used. The constructs and questionnaire were adapted from the modified diffusion of innovation model (DOI) by Rogers [13].

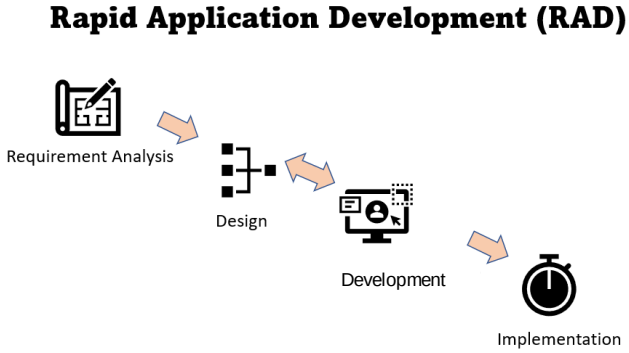

Figure 1. Rapid application development

2.1. The development

We performed several steps in developing this Tarannum-SLA by referring to the predetermined project schedule. Initially, we have identified the software and hardware requirement for this project, in that we have decided to use Adobe Flash CS5 as the main software for development. Besides, we also used other additional software like Adobe Photoshop CS5, Adobe Soundbooth CS5, and Adobe Premiere CS5. We also decided to use a powerful computer that can run the software during the development process. For example, our development computer has an 8 gigabyte RAM, 500-gigabyte hard disk, Windows 10 operating system, and Intel i7 processor. There are also several devices that we used to build up the project such as digital single-lens reflex (DSLR), earphones and microphones.

We planned to include seven types of *tarannum* in early surah as the main content in this project. The layout of Tarannum-SLA should be easy-to-navigate, for example by clicking the provided buttons [14]–[16]. Before starting the development process, we divided the works into five scopes, which are collecting information, designing, sound editing, video editing, and scripting. For the first step, we collected all information and data needed relating to the topic in this project [17]. We gathered all information from books and internet sources related to *tarannum* and multimedia. The required information is mainly on *tarannum*'s knowledge and the recitation by the chosen *Qari*. Next, we started to design the template for this project by using Adobe Photoshop CS5. We prefer this software because it is one of the great picture editors that is well-known among multimedia project developers. Moreover, Adobe Photoshop is also easy to use and can produce impressive results.

During the third step, we proceeded with the recording session. We chose Dato' Ahmad Faizul bin Ghazali as the *Qari* to recite the surah, who we recorded the audio and video to be included in the courseware. He is the winner of *Majlis Tilawah al-Quran Peringkat Kebangsaan 2003*. The recording sessions took place in the recording room at the Sultan Ahmad Shah Mosque, Pahang. Later, in the fourth step, we began building and editing the Tarannum-SLA courseware. The data and information collected have

gone through the process of editing. For example, the recorded audio and video need to be filtered to remove noise and errors, while adding some special effects to produce a good output. In this process, we used Adobe Soundbooth CS5 for audio editing and Adobe Premiere CS5 for video editing. It is because each software can produce high-quality sound and video.

Later in the fifth step, after finishing the editing, we moved to the scripting process. We started entering the audio and video into a template that was designed in the previous process. We also entered the data and information that were previously collected using Adobe Flash CS5, the main software in this project. We prefer to use this software as it is easy to manage the scene, layer, and timeline. We also created linked buttons on the template to connect all pages generated using coding and scripting. Finally, we tested the Tarannum-SLA to see its flow. If there are any errors, either in coding, scripting, content, or design, we fixed and recompile them. Then, we published the project by clicking the file at the top of the toolbar and choose export to .exe (projector). Then, the project is ready to be used by clicking the flash icon. We used the GOM player in testing this project.

2.2. Tarannum-SLA prototype

The Tarannum-SLA is an application or courseware that can be used to support an e-learning process of *tarannum* courses. This should be an effective way for learners to learn *tarannum* via electronic tools. To use Tarannum-SLA, users do not have to install any software on their computers. Once they have this application program, they just have to click and the interface page will appear, followed by the title. After that, the users need to click the 'Enter Tarannum-SLA' button to go to the main page. The main page contains seven different links. The buttons show the seven *maqamat* of *tarannum* which are *Bayyati, Nahawand, Hijaz, Rast, Soba, Jiharkah,* and *Sikah*. After that, users will choose one of the seven *maqamat* to start their learning session. Maqam page will appear, consisting of several menus like Introduction, Roles, Features, Harakat and Video. Finally, the courseware also provides four option buttons for users' convenience. Users can navigate freely using the 'Home' button to go to the main page, the 'Language' button to choose the preferred language, the 'Profile' button for a description of courseware, and the 'Contact' button to communicate between users and developers. Figure 2 shows the welcoming page of Tarannum-SLA. Figure 3 illustrates the flowchart of this courseware.

Meanwhile, Table 1 describes all the pages in the Tarannum-SLA. This courseware is built with user-friendly features. We also provide manual instruction to guide users, so that they can easily navigate the courseware by themselves. Additionally, we use easy-to-understand buttons which substitute the manual instructions [18]. For example, by only clicking 'Enter Tarannum-SLA', users can start using the courseware. This courseware is also provided in triple languages which are Malay, English and Arabic for the convenience of users. Other important elements of Tarannum-SLA are including: i) Audio - this courseware provides audio to demonstrate how to apply *tarannum* rhythms in reciting the Quran; ii) Image - this courseware provides images of surah in the Quran to help and guide users learning and reciting the Quran by using *tarannum* rhythms. The common format file for images is Joint Photographic Experts Group (JPEG) and Portable Network Graphic (PNG); and iii) Video - Tarannum-SLA provides video on every video page. Users can watch the *Qari* reciting the Quran while learning the seven *maqamat*.

Figure 2. The welcoming page of Tarannum-SLA

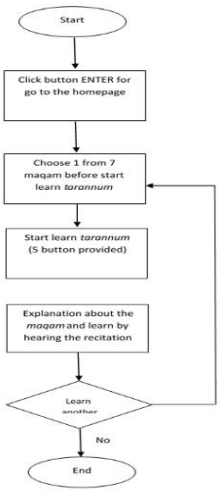

Figure 3. The flowchart of Tarannum-SLA

Table 1. The pages in Tarannum-SLA

No	Page name	Description
1.	Welcoming page	When users click on the application, the welcoming page will appear. It displays a welcoming message to the application.
2.	Main page	This page will appear by clicking the 'Enter Tarannum-SLA' button on the welcoming page. This page contains seven different links. The buttons show seven *maqamat* of *tarannum* which are *Bayyati*, *Nahawand*, *Hijaz*, *Rast*, *Soba*, *Jiharkah*, and *Sikah*.
3.	Maqam page	This page contains five different links. The buttons show the five information of maqams which are Introduction, Roles, Features, Harakat and Video.
4.	Maqam features page	This page gives brief information about the maqam to help users understand it easier. The 'Back' button is also provided for easy navigation to other subtopics.
5.	Harakat page	This page will appear by clicking the 'Harakat' button at the top of the page. This page gives different recitations for each harakat and provides a button of harakat according to the surah and maqam on the page.
6.	Video page	This page will appear when users click the 'Video' button on the top of the page. This page gives a different recitation video for each harakat.
7.	Option page	This page will appear when users click the 'Option' button at the top of the page. This page contains four different links. The buttons show the four links, which are Home, Language, Profile, and Contact.
8.	Language page	This page will appear when the user wants to select their preferred language by clicking the 'Language' button on the previous page. This page provides three options of languages, which are Malay, Arabic and English.
9.	Profile page	This page appears by clicking the 'Option' button on the top of the page. This page shows the description of the courseware. It also shows the team members of the project.
10.	Contact page	This page will appear when users click the 'Option' button on top of the page. This page shows the contact for this project which consists of phone number and email address.

3. RESULTS

To examine the usability of Tarannum-SLA, the constructs from the modified DOI were used [13], [19]. Figure 4 shows the original DOI posited five predictors, namely Relative Advantage, Compatibility, Complexity, Trialability, and Observability would predict the adoption of a certain innovation. Accordingly, we use Perceived Relative Advantage (ADV), Perceived Compatibility (COMP), Perceived Complexity (CLEX), and Perceived Observability (OBSR) as predictors of Tarannum-SLA adoption. Nonetheless, since the courseware is still in usability testing, the Intention to Adopt (ITA) is used to measure its adoption [20]. In terms of measurement, the items were adapted from past studies [19], [21] and were undergone the process of content and face validations by three experts. ADV is defined as the extent to how users perceived Tarannum-SLA better than the conventional *tarannum* learning methods. Next, COMP is about the degree to which Tarannum-SLA is recognized as being coherent with the existing values, needs and experiences of learners [22]. CLEX, on the other hand, indicates how much the application is perceived as difficult to understand and use. Furthermore, the CLEX is the degree to which the outcomes of Tarannum-SLA are visible. Finally, ITA is the level of the user's intention to continue using Tarannum-SLA as a medium to learn *tarannum*. Table 2 shows the measurement items for each construct used to measure the usability of Tarannum-SLA.

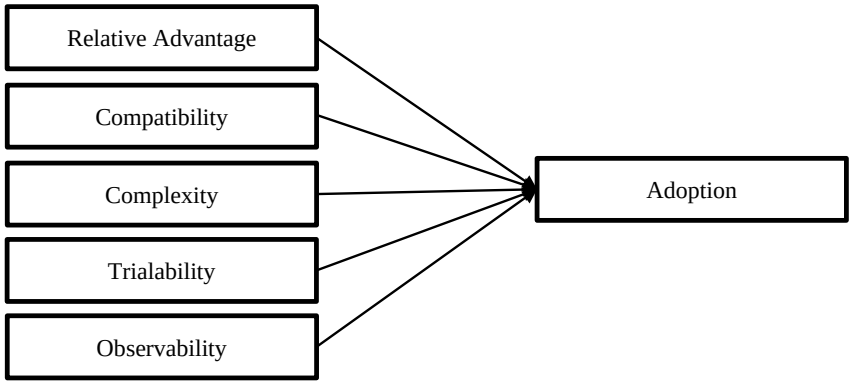

Figure 4. The DOI model

Table 2. Measurements of Tarannum-SLA usability analysis

No	Construct/Items
Perceived relative advantage (ADV)	
1	Tarannum-SLA offers more flexibility to learn *tarannum* Al-Quran.
2	Tarannum-SLA allows me to learn *tarannum* Al-Quran at my own pace.
3	Tarannum-SLA increases the effectiveness of *tarannum* Al-Quran learning.
4	Tarannum-SLA has more advantages than learning *tarannum* Al-Quran in a traditional way.
Perceived compatibility (COMP)	
1	Tarannum-SLA is more suitable for my learning style.
2	Tarannum-SLA is more suitable for my lifestyle.
3	Tarannum-SLA suits my personality.
4	Tarannum-SLA meets my personal learning needs.
Perceived complexity (CLEX)	
1	Tarannum-SLA needs a higher level of computer knowledge than I currently have.
2	Tarannum-SLA application is more complex to use.
3	Using Tarannum-SLA requires more mental effort.
4	Overall, Tarannum-SLA is difficult to use due to its complexity.
Perceived observability (OBSR)	
1	The benefits of using a Tarannum-SLA are apparent to me.
2	I have no difficulty telling others about the benefits of Tarannum-SLA.
3	The benefits of e-learning can be demonstrated.
Intention to adopt (ITA)	
1	I intend to use the Tarannum-SLA.
2	I will regularly use the Tarannum-SLA in the future.
3	Assuming that I have access to the Tarannum-SLA, I intend to use it.

The data collection procedure took four months, whereby 49 questionnaires were distributed to the randomly selected respondents. The questionnaire applied a seven-point continuous scale, ranging from 1 (Strongly disagree) to 7 (Strongly agree). Prior to answering questions, they were asked to test the Tarannum-SLA. Next, the data cleaning procedure was done. The result indicated that there was no missing value and outliers exist. The Skewness and Kurtosis analysis also produced the values between -2 and +2, suggesting that the data are normally distributed [23], [24]. Hence, all the cases are usable for further analysis. By using the IBM-SPSS Statistic (SPSS) tool, the usability analysis was done based on the Mean value of each construct. The Mean values were later divided into three levels: low, moderate, and high. To do so, the (1) is used [25].

$$r = \frac{s-1}{g} \quad (1)$$

Where *r* is the range value between each group, *s* is the original scale points (in this case=7) and *g* is the total groups to be generated (in this case=3). Therefore, *r*=2. Based on the Mean value of each construct, the range produced is 1.00-3.00 as Low, 3.01–5.00 as Moderate, and 5.01–7.00 as High. Table 3 shows the finding of the Tarannum-SLA usability analysis. To elaborate, the usability analysis revealed that four out of five constructs are at the high level: ADV (n=49, μ=5.83), COMP (n=49, μ=5.68), OBSR (n=49, μ=5.76), and ITA (n=49, μ=5.87). On the other hand, the CLEX is rather moderate (n=49, μ=4.48), although its mean value is near to a high level.

Table 3. The mean score of each construct

Construct	Mean score	Level
Perceived relative advantage	5.83	High
Perceived compatibility	5.68	High
Perceived complexity	4.48	Moderate
Perceived observability	5.76	High
Intention to adopt	5.87	High

4. DISCUSSION

The usability analysis indicates the positive responses towards Tarannum-SLA. First, ADV is related to the extent to how users perceive Tarannum-SLA as beneficial. One interesting finding is that they believe that the courseware is highly advantageous, especially in terms of the flexibility, ability to adapt to an individual's pace and would increase the effectiveness of *tarannum* Al-Quran learning. This is supported by the high extent of OBSR, which is related to the visibility of Tarannum-SLA benefits. Based on these findings, it is acceptable to say that Tarannum-SLA could be a good alternative for learning *tarannum*.

Furthermore, the COMP construct is also at a high level. In this study, COMP is about the capability of Tarannum-SLA to suit a variety of personal learning styles. With the rapid advancement of ICT, the Quranic learning method should also move along the way. Indeed, respondents agreed that somehow Tarannum-SLA is compatible with the requirements of today's modern society. On the contrary, the CLEX construct is rated as moderate by the respondents. Nevertheless, this finding is not surprising. CLEX is a construct that is related to the degree to how Tarannum-SLA users perceived it as complex, difficult and requires more effort to be used. It is posited to have a negative relationship with ITA [19].

Hence, the moderate level of CLEX indicated that the Tarannum-SLA is reasonably easy to use. But, at the same time, it also showed there are plenty more rooms for improvement to make the application user-friendly and comprehensible. Finally, the ITA is also at a high level, indicating that most respondents have a great intention to use the courseware in the future. Overall, the usability analysis has proved that Tarannum-SLA development is a success, although it might need some improvement to make sure that the application could optimally meet the needs of today's society in learning *tarannum*. In general, the result is similar to those reported by previous researcher [26] in the context of E-Qiraat courseware. Nevertheless, there is a slight difference from the earlier study on Web Courseware usability, which suggested the different levels of acceptance across educator's gender [27].

The development of the Tarannum-SLA aimed to provide convenience to *tarannum* learners and speed up the learning and teaching using multimedia elements. Additionally, this courseware is suitable for higher institutions, as it allows learners to self-practice the *tarannum* as an addition to formal classes. One of the major advantages of Tarannum-SLA is it will increase the chances to master the rhythms of *tarannum* in a shorter time compared to the traditional ways. As we all know, learning *tarannum* consumes a long time to be an expert. The *tarannum* is practical knowledge, which means, learners need to consistently exercise it. So, the Tarannum-SLA will provide them with a virtual platform to keep learning and practice.

Meanwhile, today's education is expecting a multimedia presence to improve educational quality [28], [29]. The use of such media will not substitute the role of teachers in the teaching and learning process [30]. Instead, the utilization of multimedia applications in learning a certain subject, including *tarannum* nowadays may help to improve the quality and add value to the current methods of education [31]–[33]. Moreover, multimedia technology gives new hope in this era of digitalization because it can attract the millennial generations and support their development. Therefore, it can be concluded that Tarannum-SLA is a good alternative for *tarannum* learners and could also be a tool to attract younger generations towards the Holy Quran.

5. CONCLUSION

The novelty of our study is in the aspect of the new *tarannum* learning method using interactive multimedia technology. Although there might be a similar approach that was applied for Quranic education, we discover no prior study that focused on *tarannum*, and those that test the developed courseware using a specific acceptance model are rare to be found. Hence, we filled this gap by proposing the Tarannum-SLA courseware that will be beneficial for learning the *tarannum*. To ensure that the courseware meets the needs of its potential users, we have conducted the usability analysis based on the criteria from the DOI model.

However, there is still room for several improvements to make it better. Firstly, the Tarannum-SLA only provides one surah for each rhythm or tune. Further enhancement can be done by providing more surahs for each rhythm. Besides, we are planning to provide two maqams for one surah. This is because *tarannum* is flexible, and it is possible to have a lot of tunes on verses in the surah. Secondly, the surahs that are included in Tarannum-SLA are basic surahs for beginners to learn *tarannum* styles. For further improvement, we will include advanced and challenging surahs that have different waqaf according to tajwid. This is because each *waqaf* has a different style, like *burdah* for the ending of every harakat. This will help learners to identify harakat and burdah accurately. Thirdly, there is only one *Qari* that we invited to recite the surahs in Tarannum-SLA. For future improvement, we plan to invite more *Qaris* so that users have more options to select their favorite *Qari* that is suitable for their tone. Finally, for the video aspect, we have a limitation due to the lack of equipment that reduces the quality of the recording. This is an important aspect that we hope to improve in the next version. To sum up, our main objective in developing this Tarannum-SLA is to help Muslims around the world to understand *tarannum* deeply. Therefore, it is hoped that this courseware will contribute to the communities and attract the younger generations toward the Holy Quran.

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