

Evaluation of the Usability of the Animated Infographic Module on Arabic Grammar Learning Based on the TUP Model

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Abstract

For today's youth, using technology into educational activities has become essential. The availability of technological resources, such as tablets, laptops, and smartphones, enables students to swiftly access course content. The study of Arabic grammar is a challenging subject, and educators use technology as a teaching tool. Using infographic programmes, which emphasise information presentation in an easy-to-understand and engaging manner, is one of them. This study was conducted to evaluate the usability of an animated infographic module that has been developed through a Design and Development Research (DDR) approach. This usability evaluation is based on the TUP Model (Bednarik, 2002). This model includes technological aspects, module usability aspects and pedagogical aspects. A semi-structured interview was used as a research instrument involving five respondents. Qualitative interview data is structured into themes based on the model. The researcher also used the document analysis method through student feedback notes in the Padlet application after the last learning session. The results show that students are satisfied with the usability aspects of the module and are suitable for use as simple and effective learning materials.

Keywords: Arabic Grammar, Animated Infographics, Modules, TUP Model, Usability

Introduction

The extent of student's proficiency in Arabic grammar remains up for debate (Mat Jusuh et al., 2014). This is caused by the inherent properties of grammar. Abd Rahim (2012) asserts that studying Arabic grammar might be challenging due to a variety of concepts and terminology. Other languages do not follow the Arabic grammar system since it is too restricted and intricate to learn. This is demonstrated by a thorough and in-depth discussion of the sentence and line structure system, word placement, theories, and examples that are

too dissimilar from students' everyday experiences to make learning them easy or enjoyable (Muda, 2015; Mohamed et al., 2003).

Although the natural characteristics of the Arabic grammar method are complex, it does not mean that mastery of it is limited. Various teaching methodologies in Teaching and Learning (TnL) Arabic grammar have been practiced by teachers. However, the selection of a creative and appropriate approach needs to be widely practiced in line with current technological developments. This is able to impact TnL activities in addition to achieving the desired objectives (Ismail et al., 2018; Idris & Osman, 2009).

Mohamed et al. (2003) claims that learning TnL Arabic grammar demands for an enjoyable approach. The goal of the straightforward and approachable presentation is to keep students from becoming disinterested or believing that learning is hard. While some students are able to commit the knowledge they have learned to memory, comprehension that is ultimately applied is what matters most. Students can accurately and consistently apply the knowledge they have learned. These days, using technology has become essential, particularly in the realm of education. One of the factors driving the use of technology in TnL is the widespread exposure to technology to the current generation of students (Osman, 2017). They cannot be separated from technology and multimedia and even become something that facilitates and attracts their attention. This is because the content presented in the computer application is scientific in nature and suitable for today's advanced age (Che Hat, 2011).

The application of technology not only facilitates the TnL process but also makes a great contribution to 21st century learning (PAK21). Technology applications that focus on student-centered learning are an important foundation for PAK21 (Sahrir et al., 2020). The student's role is fully used in engaging to understand learning methods and what is learned (Abdin Lubis et al., 2019). This does not mean that the role of the teacher is completely abandoned but that the teacher becomes a facilitator and is not completely dependent on their teaching.

Multimedia can be used as an alternative for the TnL of Arabic grammar in an effort to harness the benefits of technology and make TnL exercises more engaging. Static textbook content can make use of multimedia that combines text, images, audio, video, and animation. This can result in more creative and engaging new learning patterns (Wan Jamel, 2013; Harun & Tasir, 2005).

An additional method of utilising multimedia technology is content learning through animated infographics, which are becoming increasingly common in information delivery. In addition to emphasising student-centered learning, the usage of infographics in TnL helps to communicate knowledge to students directly and in a straightforward graphic style. According to Krauss (2012). Che Lah (2007) asserts that students' attention can be piqued by learning that uses animation and graphic components. Information presented through attractive graphics in addition to emphasising the selection of text and colours can make the process of obtaining information faster and easier. This method can also help students in understanding a learning topic more easily and effectively (Mohd Noh et al., 2017). A simple and focused information in addition to the addition of multimedia elements becomes an alternative to facilitate the understanding of complex information.

Thus, an Arabic grammar learning module based on animated infographics has been developed and known as the iGQA module. Once developed, a usability study was conducted based on the TUP Usability Evaluation Model (Bednarik, 2002).

Igqa Module

According to Lankow et al. (2012), animated infographics are able to attract the audience emotionally through audio, music, or voice that is the background to the animated movement of the information. The audience has the opportunity to communicate with the message to be delivered in an effective way.

Animated infographics that combine moving graphics and words are able to attract the audience to see and read them (Rahim, 2017). In addition, according to Soyluçiçek (2015), this medium can also convey more information with successive image movements compared to static images.

According to Rahim et al. (2018), the features found in animated infographics become a very effective communication tool in conveying information to the audience. Animation is able to convey more meaning that makes it possible to show complex concepts in a very simple visual (Lievemaa, 2017).

The purpose of this study is to assess the usability of modules created using animated infographics as a basis. Design and Development Research (DDR) was used to create this animated infographic module for learning Arabic grammar, also known as the iGQA module (Richey & Klein, 2007). This module covers the subject of the first 20 *bayts* of *Alfiyah* Ibn Malik in the textbook *Sharh Ibn 'Aqil*. Static infographics are used to summarise and present the key points of each topic. Each title's division is combined into an interactive eBook with a QR Code that makes it easier to access the iGQA Module, which takes the shape of an animated infographic film. The eBook also includes a QR Code that allows users of this module to access online training activities via the worldwall.com programme. This serves as an assessment for students. After that, Adobe After Effects software is used to create animated infographics, which are then posted to a dedicated YouTube channel.

The development of the iGQA Module is based on certain models and theories to ensure that the process is carried out according to the correct method. Learning materials that apply multimedia elements such as animated infographic videos are able to attract students in understanding a complex and detailed concept.

This module emphasises individual learning and building on prior knowledge by utilising constructivism and cognitivism theories in multimedia. The utilisation of freely produced modules by students is made possible by convenient technological access ways. After receiving guidance from the teacher, students can use the module at their own pace according to their individual learning styles thanks to its various components. Students will find this iGQA lesson to be an engaging and simple way to learn Arabic grammar thanks to all the features that were incorporated into its creation.

TUP Usability Evaluation Model

The TUP model (2002) is an abbreviation of three words, namely "technology", "usability" and "pedagogy". The learning environment is emphasised by the three components of this model—technology, usability, and pedagogy—in accordance with their respective domains. The TUP model (2002) is employed to assess a technology-based learning module's, product's, or application's usability.

The technology aspect focuses on issues such as the dependency and interaction between the surrounding environment with software and hardware tools, issues related to security and privacy as well as material sharing and reuse (Bednarik et al., 2004). The usability aspect in the learning environment includes several issues related to usability and perception. The pedagogical aspect refers to the need to assess the quality of TnL in the educational

environment. Therefore, issues such as the learning context, the role of the students involved, motivation and evaluation are emphasised.

The TUP Model's (2002) assessment tool was the checklist. This checklist is in the form of questions for each item and the questions have been implemented for validity and reliability. Whether the instrument is a choice of answers, an open inquiry, or a questionnaire, the answers provided are flexible. The checklist's content is divided down into three sections: technology, usability, and pedagogy. The pedagogical section is based on the theoretical framework of Constructivism Theory (Soloway et al., 1996), while the technological usability section is based on Nielsen's Usability Model (1994).

For the context of this study, the TUP Model (2002) was used to evaluate the usability of the iGQA Module which represents three aspects, namely:

- i. Technology that focuses on the application of technology in the use of modules.
- ii. Usability involves usability and perception of module content.
- iii. Learning pedagogy involves learning processes and activities as well as module evaluation.

Research Methodology

The research instrument used in this phase involved semi-structured interviews based on the TUP Model (Bednarik, 2002). Open-ended interview questions were used as instruments. According to Creswell (2003), open-ended questions allowed the researcher to collect a variety of information from the sample that may not be obtained through questionnaires. This type of interview was chosen because the background and experience of the respondents were different. Because of its adaptability, respondents could tell the researcher what they think. Three researchers examined the interview questions in this phase's instruments to ensure their validity. Using the Padlet application, student feedback notes on module usability were also used for document analysis. Five students were chosen to participate in the survey.

This study involves certain procedures in data collection:

- i) The first stage is the module implementation stage which involved location selection, online learning and self-learning. For this stage, UniSZA was chosen as the study location because the module was developed based on the Ibn 'Aqil Syntax Text Study course offered for Bachelor of Arabic Studies students, UniSZA.
- ii) The second stage involved selecting respondents and developing interview questions.

Subsequently, the curriculum was utilised by 74 Bachelor of Arabic Studies students during the third semester of the 2019/2020 study session. After completing a seven-week online course, they received an interactive eBook that gave them access to the iGQA Module and its training exercises. Following the learning session, a sample was chosen to be interviewed regarding the module's usability. Researchers then created and verified semi-structured interview questions. Respondents were contacted in advance by the researcher and an appointment was made at a convenient time. Using the Webex programme, the researcher conducted the interview online. They were given advance notice of the questions ahead of the interview. They were also advised to confirm the accuracy of the information obtained by providing accurate answers to all inquiries.

Additionally, document analysis was generated from student input utilising the Padlet programme. This input becomes one of the important data sources that strengthens the conclusions of the study.

- iii) The third stage is the stage of analysing interview transcripts and analysing documents.

The third stage is the stage of analysing the interview transcripts. At this stage, the analysis of interview transcripts was divided into aspects of technology, usability and pedagogy according to the TUP Model (2002). Turner (2010) states that interview preparation is very important to maintain a clear focus. This is in line with the selection of interview methods that aim to obtain maximum information to answer the research questions. Therefore, several procedures were practiced for this interview stage; namely setting an appointment, choosing a suitable place, explaining the purpose of the interview, showing confidence to interview, explaining the interview format, and informing the time period for the interview.

- iv) The last stage is the stage of writing a report based on the findings. Qualitative data refers to semi-structured interviews. The data obtained from the semi-structured interview process were transcribed according to themes based on the TUP Model (2002), namely technology, usability, and pedagogy. The data will be analysed thematically to see the strengths and weaknesses of the module as well as improvements that can be taken to strengthen the learning module. While document analysis was used as support for data for evaluation and triangulation process to interview data.

Findings And Discussions

The researcher conducted semi-structured interviews with five students. They were selected based on the results of tests conducted online according to the highest, medium and low scores. The gender of the respondents consisted of two male and three female students. For the interview findings, the transcripts of the interview answers were structured into themes based on the TUP Model (2002). This model includes technological aspects, module usability aspects and pedagogical aspects. The researcher also used the document analysis method through student feedback notes in the Padlet application after the last learning session.

Findings of Technological Aspects

The technology aspect focuses on issues such as dependencies and interactions between the surrounding environment with software and hardware tools, issues related to security and privacy as well as material sharing and reuse.

- i. Application of Animated Infographic Technology in Modules

Students in particular benefit from the iGQA Module's use of animated infographic technology, which makes content easier and faster to recall. This is due to the fact that the auditory, visual, and motion aspects found in video applications facilitate quick and easy comprehension. According to students, this application is appropriate for the current generation given the state of technology.

- ii. **Animated Infographic Elements Practiced in Modules**
The results of interviews with students (R1) to (R5) related to the animated infographic elements practiced in the module showed that the elements were applied based on the animated infographic design. The main elements mentioned by the students were movement and audio. These two elements stimulated their interest and understanding.
- iii. **Technology Tools to Access Modules**
The findings of interviews with students (R1) to (R5) showed that students use smartphones and laptops to access the module. The difference in terms of frequency of use between the two tools. This module can be accessed through the medium according to the student's convenience and comfort.

Findings on Usability Aspects

Usability aspect refers to the learning environment which includes some issues related to viability and perception.

- i. **Learning Patterns Using Modules**
According to the results of the student interviews (R1) through (R5), students were satisfied with the learning strategy used in the iGQA Module. In comparison to textbooks, they believed the material offered is condensed. Because the key points are concise, and easier for people to understand. Additionally, all it takes to access YouTube channels is clicking the link provided in the eBook. Because of all of this, the learning pattern used in the lesson is simple and engaging.
- ii. **Suitability of Module Use with Learning Patterns at UniSZA**
As a result of the interview findings with students (R1) to (R5), they agreed that the use of the module is suitable for the learning pattern at UniSZA. They usually only use textbooks as learning materials in class. This module helped increase their motivation with colourful information and the information presented is not too complex. In addition, the use of this module online is also very compatible with learning at UniSZA, which now practices TnL online.
- iii. **Relevance of Module Use to Students' Understanding of Learning**
According to the findings of the interviews about the module's suitability for the students' understanding of learning, students (R1) through (R5) said that the iGQA Module's use is appropriate for their understanding of learning. Exercises and condensed material presented in entertaining animated videos are appropriate forms of content for their comprehension.
- iv. **Module Weakness**
The findings of the interviews with students (R1) to (R5) above were related to the weaknesses that exist in the module. Students faced problems with some parts of activities that used the wordwall.net medium such as difficulty answering exercises on smart phone displays, internet access problems and also displaying the type of writing on the questions. In addition, it is difficult to understand the *bayt* because there is no explanation in Malay.

v. **Module Strengths**

There are several strengths of the module in terms of its use of the results of interviews with students (R1) to (R5). Among them, the students thought that this module improves the understanding of the content of the topics studied in class. This is because the module is presented in the form of a video containing coloured animations, audio explanations and organised information.

Findings on Pedagogical Aspects

The pedagogical aspect refers to the need to assess the quality of TnL in the educational environment. Therefore, issues such as the learning context, the role of the students involved, motivation and evaluation are emphasised.

i. **Structured Learning Process**

The findings of interviews with students (R1) to (R5) show that students thought the learning process applied in the iGQA Module is systematic and orderly. They stated that the learning steps practiced starting from textbook notes to training activities helped them follow the learning process in an organised and focused manner.

ii. **Relation of Module Content to Learned Knowledge**

The findings of interviews with students (R1) to (R5) showed that students thought that there is a connection between the content of the module and what they have learned while in the learning class. This is because the course learning measures are the same and this module supports and improves their understanding. Exercises and activities also help them revise.

iii. **Building Self-Understanding**

The findings of the next interview related to aspects of building self-understanding after using the module. Students (R1) to (R5) stated that they were able to build their own understanding after using the module because it is simple and focused information was easy to remember and understand.

iv. **Self-Learning**

According to the results of the student interviews (R1) through (R5), students thought they could study the iGQA Module without extensive teacher assistance. Without requiring in-depth explanations, they can readily access the module thanks to structured module learning processes. Some students, on the other hand, believe that clarification should come first in order to improve understanding of the module's material.

v. **Module Activities**

The results of the aforementioned interview pertain to the opinions of students (R1) through (R5) regarding the module's educational activities. Their interest is piqued by the way wordwall.net is used to produce a variety of activities. The test questions measure both comprehension and processing speed. They can repeat the exercises offered, which aids in improving their memory of their mistakes.

vi. Discussion Activities During the Learning Session

The findings of interviews with students (R1) to (R5) show that students think discussion activities help them in module learning sessions. Two-way interaction between teachers and students and among themselves helps to understand the content of the module more clearly and deeply.

vii. Module Assessment Activities

According to the results of the student interviews (R1) through (R5), students believe that the module evaluation activities assist them in identifying their own mistakes. The evaluation's objectives are to examine *bayt* memorisation, content comprehension, and accurate word line reading using the wordwall.net platform.

Figure 1 shows the main themes of the TUP Model (2002) and sub-themes resulting from the interview findings:

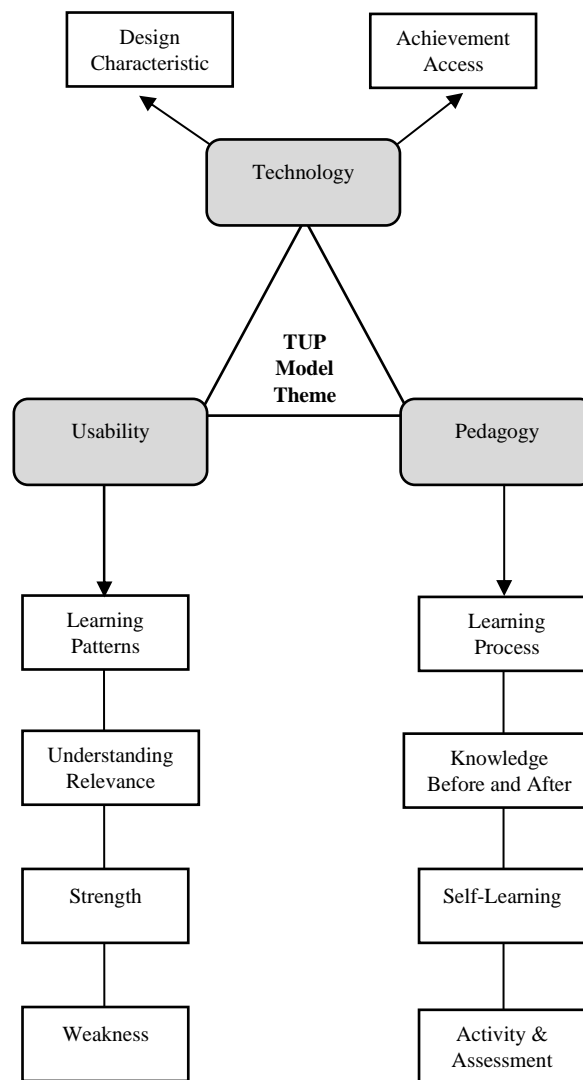


Figure 1: The main themes of the TUP Model (2002) and the sub-themes of the interview instrument

The results of an interview with five students found that they were satisfied with the technology aspects, module usability and pedagogy or module learning based on the TUP Model (Bednarik, 2002). Document analysis involves student feedback on the iGQA Module using the Padlet application. The feedback received was very positive regarding the usability of the module. This document becomes the supporting data for the interview instrument.

According to the respondents, animated infographic elements were fully included in the module, according to the research findings for the technological side of the module. They use laptops and smartphones to access the module. These days, these easily navigable technical instruments are a need.

As for the third aspect of the TUP Model, which is the pedagogical aspect, the students who were interviewed stated that the steps followed during the learning session were systematic and orderly. The relevance of the module to what they learn in class also helps them memorise and understand faster. Learning module content along with various training activities test their understanding of the topic.

The module content and training activities provided attract their interest to learn Arabic grammar more easily and help them to memorise the content of the topic more quickly. Using components like animations, graphics, and audio may captivate their attention and make it easier for them to recall key information. Students believe that by having explicit usage instructions and step-by-step instructions, the iGQA Module learning process becomes more structured and methodical. Additionally, the idea of self-accessible modules enables students to use them on their own without complete teacher supervision.

The findings of this study also contribute positively to the conclusions of previous research regarding the use of infographics in enhancing students' motivation and interest in understanding information. Moreover, the study's findings are more prominent with the implementation of online activities that incorporate question-and-answer sessions and discussions. All the features incorporated in the development of this iGQA Module make it an attractive and user-friendly innovation for students to comprehend Arabic grammar content.

Conclusion

Overall, the results indicate that students are satisfied with the pedagogy, technology, and usability used in the iGQA Module. This module's application of basic information, animated graphics, audio, and background sound, among other things, can entice students to grasp intricate and sophisticated Arabic grammar. Because this module is readily available in the form of eBooks and YouTube videos, it can be used as self-learning support material. Students' comprehension of the material they have learnt can also be enhanced by the interactive tasks offered in each lesson. Students who wish to learn Arabic grammar in a fun and relaxing way can use this module because of its methodical emphasis on technology, usability, and pedagogy.

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