

RESEARCH ARTICLE

Evaluating the pedagogical usability of an infographic module for learning Ibn Aqil's syntax in Malaysian higher education

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Abstract - Traditional *Turath* textbooks are fundamental references for learning *Nahwu* (Arabic grammar). However, students often face difficulties in understanding the book content. This study developed an infographic learning module for students by visualizing key content to facilitate comprehension. To test the module, a usability survey design was utilized. The study involved 73 students in the Ibn Aqil Syntax Text Study course at Universiti Sultan Zainal Abidin (UniSZA), Malaysia. The data were collected using a self-developed structured questionnaire. Descriptive statistics were used to analyze the data in the SPSS software Version 22. The module's content, design, usability, and perceived impact were evaluated. The findings showed that the module is positively perceived by students, with high mean scores ranging from 4.64 to 4.73 in all constructs. The students reported that the module enhanced their motivation and focus on the essential points of the content of *Turath* textbooks. These outcomes highlight positive perceptions of the module's usability and learning support. The study concludes that infographic modules are highly effective for student engagement and supplementing traditional grammar texts, with the potential to enhance students' learning outcomes through visualization.

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1. Introduction

The study of the rules and order of words in a sentence is included in Arabic grammar, which is also a branch of Arabic linguistics (Wan Mokhtar et al., 2017). Arabic grammar focuses on the inflectional changes that occur at the end of words in sentence construction. This refers to inflectional processes that determine the grammatical endings of words. In addition, Arabic grammar is the key to understanding the sciences of the Arabic language. The learning of Arabic grammar aims to prevent errors in reading and ensure accurate comprehension of meaning. Grammatical errors can cause the intended meaning to be inaccurate and result in major errors in understanding Arabic texts that are usually found in religious books. Scholars in the field of language state that the learning of all languages in the world emphasises the aspect of grammar (Mohamed et al., 2003).

All languages in the world, including Arabic, are highly concerned with correcting the use of their own grammar (Karim et al., 2020). According to Jaffar and Sha'ari (2016), Arabic grammar serves as the foundation for the norms of the language, which will decide whether it may be used properly. Proficiency in Arabic grammar is a prerequisite for practicing all other language skills, such as listening, speaking, reading, and writing. This statement also aligns with the findings of al-Khuli (1986) and Rahman et al. (2020) that learning grammar for every language in the world is a very important foundation in ensuring that the language is used in the right way. It also serves to give an accurate understanding of the meaning of Arabic sentences or texts. Specifically, *Nahwu* (Arabic grammar) is a foundation for accessing and understanding classical Islamic texts, yet students often find it challenging due to the complexity of *Turath* references such as *Syarah Ibn Aqil* and *Audah al-Masalik*. These books are important and relevant to Arabic education, but they are often text-heavy and taught using teacher-centered approaches. Consequently, a significant number of students face challenges in engagement, cognitive processing, and understanding the content. To address these challenges, students require effective instructional tools to enhance engagement and facilitate comprehension.

The present study utilized the Dual Coding Theory and the Cognitive Load Theory proposed by Paivio (1986) and Sweller (1988), respectively. Dual Coding Theory emphasises the integration of verbal and visual representations in learning, while Cognitive Load Theory focuses on reducing unnecessary cognitive demands to optimise working memory. This study also employed the constructivist approach. This constructivist perspective emphasises active learner engagement in meaning-making and supports the use of visual resources such as infographics. They support several modes of representation. This approach facilitates reducing extraneous cognitive load. It also promotes a learner-centered approach. Infographics have several benefits in learning Arabic grammar. For instance, they facilitate students' prevention of cognitive overload. They do so by breaking information into manageable units. Infographics also enable students to view the structure of sentences at a glance through visual illustrations. The use of color, icons, and spatial layout can guide students to pay attention to key ideas. They reveal points that students may not easily detect in lengthy text. In teaching *Turath* grammar texts, these features are especially valuable. They facilitate students' understanding of complex

information in *Turath* books such as Syarah Ibn Aqil. For this reason, the current study aims to evaluate an infographic module for the study of Ibn Aqil's syntax at Universiti Sultan Zainal Abidin, Malaysia.

The existing Arabic grammar teaching method relies on traditional approaches. These approaches do not facilitate students to engage with the text (Zaini et al., 2019; Mat Teh, 2009; Samah, 2009; Mohamad, 2005). This lack of engagement is often associated with teachers' repetitive and monotonous teaching approaches (Salleh, 2006; Mohamed et al., 2003). Additionally, traditional methods prioritize lectures with minimal discussion, which does not facilitate students' interest, especially compared to interactive and technology-based approaches (Ismail, 2008). The *Turath* books play an important role as major references for learning Arabic grammar. However, students' knowledge is constrained, and misunderstandings arise when information is delivered in excessive detail or through lengthy explanation. This kind of presentation results in unclear content (Abdul Hamid, 2021). This circumstance adds to the students' disinterest in studying the book's material further. According to Jusoh (2013), upon observation of the content presentation of Arabic grammar information, the information presented is too detailed and philosophical. Referring to *Syarah Ibn Aqil*, for example, the information presented contains a long description and does not focus on the important contents in it. This causes students to get bored easily and find it difficult to understand the contents. Therefore, the teaching materials are important in understanding and deepening the process of learning (Sjahrony et al., 2017).

The selection of learning materials must also be appropriate to the students' ability level, which can attract their interest and increase their motivation to use the materials (Sjahrony et al., 2017; Yusoff, 1999). Learning Arabic that only depends on textbook information causes teachers to take the initiative to use additional teaching aids in their teaching and learning (T&L) process. According to Rusli (2014), when students see textbooks as a mundane learning material, this situation causes teaching and learning to be ineffective, as students become less interested and lose focus during the session. As an alternative to finding a resolution to the specified problem, the use of information transfer through infographics is an effective and engaging instructional approach. Information is offered in attractive illustrations. The study of Noh et al. (2017) found that students are more likely to recognize information by using effective visual messages and a blend of attractive visuals. According to them, any information transferred must emphasise the use of noticeable colours in combined with clear and logically structured text, maintained by relevant illustrations, diagrams, or tables, to generate an organised and well-organised information presentation. Despite the growing use of visual learning tools, limited studies have examined the usability of infographic-based modules in the context of classical Arabic grammar, particularly in *Turath* text studies.

As one of the educational tools that can access, manipulate, and use complex statistical information to make it relevant in daily life, Sweeper (2016) mentions that the usage of visual data and infographics becomes a significant source of information delivery. Infographics, which combine large images with detailed information, are an effective tool for designers to demonstrate their expertise in presenting complex data. (Kibar & Akkoyunlu, 2015). Infographics, a term derived from the combination of "info" and "graphics," is a recent technology that visually presents complex data and concepts through graphic drawings, such as illustrations, symbols, maps, and graphics, making them simple, clear, and attractive to understand (Krum, 2013). Infographics are divided into three types, which are static infographics, animated infographics, and interactive infographics.

1.1 Teaching of Arabic Grammar

Arabic grammar is traditionally attributed to Abu al-Aswad al-Du'ali. This field developed in response to the emergence of lahn (linguistic errors) among Arabic speakers (Mat Teh, 2010). Next, it developed with writing that was systematically compiled by language scholars such as Matan Alfiyah Ibn Malik. Numerous classical works discuss this subject in detail, such as Syarah Ibn Aqil, Audah al-Masalik, and Hasyiah al-Sabban (Thohari, 2011). At the university level, *Turath* texts are commonly used as core instructional materials. Institutions of religious studies that offer traditional religious and Arabic language education, such as pondok (religious school) institutions, have started teaching Arabic grammar to their students (Muhammad et al., 2006). Traditionally, the learning process was conducted through talaqqi, whereby students studied classical texts directly with a teacher, that is, by reading old books with the teacher and using the translation method (Mat Teh, 2010). Many famous scholars were born from this education system, such as Tok Kenali and Sheikh Daud Fatani, who have high knowledge of religion and the Arabic language (Muhammad et al., 2006).

For the primary school level, Arabic grammar learning is combined with language learning so that basic learning focuses more on proficiency. In contrast to the secondary school level, most religious schools in Malaysia, such as the State Religious School and Public Religious School (Sekolah Agama Negeri & Sekolah Agama Rakyat), use the Integrated Secondary School Curriculum (KBSM) and the Bu'uth al-Azhar Curriculum. For the Bu'uth al-Azhar curriculum, there is a specific Arabic grammar subject starting from grade one to grade six, which is taught separately from other Arabic language subjects (Samat et al., 2017). Nowadays, the Bu'uth al-Azhar curriculum has been changed to the Early Integrated Curriculum (KBD) in religious schools that are registered as Government-Aided Religious Schools (SABK). KBD has become a national curriculum and has been implemented until now, which emphasises learning Arabic according to subject (Rahman et al., 2020).

At the university level, the learning measures used are more focused on the main *Turath* books that discuss Arabic grammar, such as *al-Wafi*, *al-Nahwu al-Wadih*, *Syarah Ibn Aqil*, and *Audah al-Masalik*, to name a few. At this stage, students are encouraged to learn the knowledge by referring to the main books, not only specific to Arabic grammar but also other areas as well. Even if there are many approaches and methods for imparting knowledge, research, and other

initiatives are ongoing to ensure that the methods are periodically enhanced (Faculty of Languages and Communication, UniSA, 2018). The use of the *Turath* in grammar is used in assessing the Bachelor's Degree of Arabic Studies programme, which is reflected in Table 1. The programme requires students to complete 126 credit hours over eight semesters to graduate. The core courses offered focus on the knowledge of the Arabic language according to the level and suitability of the study semester. The Arabic grammar course involves three levels, which are offered in the third, fifth, and sixth semesters of study.

Table 1

Descriptive Statistics for Arabic Grammar Course Bachelor's Degree Programme of Arabic Studies

Semester	Course	Course Code
Third	Ibn Aqil Syntax Text Study	BAA 20803
Fifth	Ibn Hisham Syntax Text Study	BAA 31803
Sixth	Hashiah al-Sabban Syntax Text Study	BAA 32303

1.2 Studying the Turath texts

The Turath texts are the result of the writings of previous scholars in various fields of knowledge. It is a valuable relic as a source of knowledge related to religious knowledge. Turath is generally defined as something that is a legacy or heritage of previous people. In Malaysia, the Turath books that are used in studies in Pondok are especially religious books written in old Jawi script. The book is also known as the classic book or the yellow book (Azhar, 2023; Badaruddin, 2012). Regarding the field of Arabic language study, several works with distinct methodologies have been authored by earlier scholars. For instance, there are numerous books, as mentioned before, that have been written and are still utilised in T&L. Turath texts serve as primary sources of knowledge, particularly when it comes to Arabic language-related fields (Zakaria et al., 2024).

This study focuses on the use of Syarah Ibn Aqil's book for the third semester of the Ibn Aqil Syntax Text Study course. The Turath is written by Baha' al-Din Abdullah ibn Aqil al-Hamdani. He explained Matn Alfiyah Ibn Malik (a rhymed book of Arabic grammar) through this book. The writing of this book contains a detailed description of each bayt alfiah. This description is presented in a long text without having focused content. This motivates the use of infographics as a medium to convey the content of the book with visually engaging elements. Despite the increasing integration of visual learning tools in language education, limited research has examined the usability of infographic-based modules in the context of Turath grammar instruction, particularly in Malaysian higher education.

1.3 The Challenge of the Turath Texts in Teaching Arabic Grammar

Classical grammar books, such as *Syarah Ibn 'Aqil*, are fundamental to Arabic grammar pedagogy, but their complex content and reliance on teacher-centered explanations often lead to students' loss of interest and lack of understanding. The complexity and abstraction of these texts pose significant challenges, as syntactic rules are often presented through archaic linguistic debates, making them less engaging for contemporary learners. Ahmad and Zainuddin (2020) highlighted students' difficulties in sustaining interest in learning Arabic grammar when instruction depends on text-heavy explanation. To ease this cognitive tension, the Dual Coding theory indicates that text and visuals can be combined to enhance students' ability to process and recall information. The Cognitive Load theory also indicates the need to reduce unnecessary load. This is because cognitive load is often at its highest when trying to understand the complex structures of Turath commentary. In this way, signaling and color-coding techniques can facilitate improved learning outcomes. To achieve this, the design must align with the learner's proficiency level (Kalyuga, 2011; Mayer, 2017).

The lack of modern instructional tools for Turath is also a significant challenge. A needs analysis in Malaysia found that learners requested interactive infographics and visual tools to support their grammar learning (Othman & Ghazali, 2019). These tools are particularly useful for helping learners understand traditional grammatical frameworks. Some studies reported a high degree of students' acceptance of infographic learning modules (Rahman et al., 2021; Hassan, 2022). The transition from traditional learning to technology-mediated instruction remains difficult. Technological innovations contribute to the growing interest in making syntactic structures available (Al-Khalifa & Al-Wabil, 2020; Habash et al., 2019). These include innovations such as VR-enhanced environments and NLP-based dependency treebanks. On the other hand, they are rarely integrated directly into the Turath curriculum. The gap between the traditional and the innovative ideas remains a challenge. Many existing approaches in modern education have not been sufficiently tested or implemented in authentic learning contexts.

The above-mentioned challenges can be addressed by moving toward infographic illustrations. Studies in Arabic learning have shown the potential for a fully integrated visual pedagogy. For example, a study with Arab students reported significantly better vocabulary retention using infographic lessons compared with text-only instruction (Alrwele, 2017). This outcome indicates that the "text-heaviness" of grammar can be contextualized if information is presented through visual hierarchies. Recent studies on assessment literacy found higher grades when infographics supplemented textual guidelines. This outcome suggests that the "hidden" logic of grammar rules becomes visible through design (Murzyn et al., 2024). A meta-analysis also indicates that infographics support comprehension when personalized to cognitive needs

(Dunlap & Lowenthal, 2016). Using infographic modules, educators can ease students' difficulties. They can transform the scholarly tradition into an engaging learning experience. Therefore, the current study aims to achieve the following objectives:

1. To examine students' perceptions of the infographic-based Arabic grammar module.
2. To evaluate the design features of the module.
3. To assess the usability of the module in supporting learning.
4. To investigate its perceived impact on students' Arabic grammar learning outcomes.

2. Methodology

2.1 Research Design

The current study employed a quantitative survey design to evaluate students' perceptions of the Arabic grammar infographic module. The study employed a usability survey design involving 73 student respondents at the selected institution. The design is appropriate for answering Research Questions 1-4, which focus on usability, content, and perceived learning support.

2.2 Module Development

The development part of this module uses the Design and Development Research (DDR) method (Richey & Klein, 2007). The DDR method covers three stages: the needs analysis stage, the design and development stage, and the usability evaluation stage. The design and development procedure is grounded in Sidek's Module Construction Model (2001) and Infographic Design Model (IDM) (Kibar & Akkoyunlu, 2015). Constructivist and cognitivist learning concepts are also used as a foundation in the procedure. The content of this module includes the Ibn Aqil Syntax Text Study Course offered to students who enrolled in the Bachelor's Degree Programme in Arabic Studies at UniSZA. This study produced a static infographic module. Static infographics present information through non-moving visual elements using graphic elements suitable for print media such as posters, newspapers, and advertisements, as well as for digital platforms, including websites and social media.

The developed module contains an explanation of the book, *Syarah Ibn Aqil* in the form of an infographic. The module is organised into 20 abyāt (verses) of *Alfiyyah Ibn Malik*, covering topics such as word classification, mabniy, and mu'rab. In addition to simple and graphic explanations, this module also contains interactive exercises using the wordwall.net platform. This module can be accessed in the form of an electronic book containing a QR Code. Before the module's development, a needs analysis was conducted to determine what the students perceive should be included in the module. Once the module has been established, experts are consulted to ensure its suitability for use by students. Figure 1 indicates an example of the developed module content.

Figure 1

Example of Module Content



2.3 Instrument, Reliability and Content Validity

Data were collected through a structured questionnaire consisting of four constructs: content, design, usability, and perceived impact on learning. The content construct consists of nine items related to learning, language, exercises, and infographics. The design construct comprises six items concerning graphic design, textual content, colors, font size, writing style, and readability. Moreover, the usability construct comprises seven items, including accessibility, instruction clarity, and motivation to use. Additionally, the perceived impact on learning construct comprises five items relating to the module's suitability for independent learning, content relevance to learning, independent learning ability, critical

thinking ability, and reflection. Each item was measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

The questionnaire was adopted from the usability instrument developed by Osman (2017) and modified to suit the purpose of the study. For content validity, the questionnaire was validated by three experts in Arabic education. All experts are PhD holders and hold university academic positions in Malaysia. Subsequently, the questionnaire items were refined based on the experts' recommendations. For reliability, a pilot study was conducted with 15 participants. The decision is based on Baker's (1994) recommendation that a sample of 10-20% of the sample size for the actual study is a reasonable number of participants to consider enrolling in a pilot study. A convenience sampling technique was employed due to the accessibility of participants enrolled in the course. The pilot study revealed a total Cronbach's Alpha of 0.903, indicating excellent internal consistency among the items in the instrument. This suggests that the questionnaire is highly reliable and that the items consistently measure the same underlying construct.

2.4 Respondents

A total of 73 students from the third semester of the 2023/2024 academic session participated in the study. Students were provided with a study plan proper instructions so that the steps of using the module are guided, and they follow the correct procedure. The questionnaire was distributed after they used the module.

2.5 Data Collection and Analysis

The data were collected from a sample of 73 undergraduate students enrolled in the *Ibn Aqil Syntax Text Study* course at UniSZA. 57 were female (78.1%), and 16 were male (21.9%). Questionnaires were distributed at the end of the semester after the students completed the infographic module. The responses were analysed using SPSS. Descriptive statistics (mean, standard deviation) were used to summarize students' perceptions of the module across the four constructs. The mean interpretation scale was attained from Nunnally and Bernstein (1994), as shown in Table 2.

Table 2

Mean Interpretation Scale

Mean Score	Interpretation
1.00 – 2.00	Low
2.01 – 3.00	Moderate
3.01 – 4.00	Moderately High
4.01 – 5.00	High

Source: Nunnally and Bernstein (1994)

2.6 Ethical Considerations

This study was conducted in accordance with the ethical research standards prescribed by Universiti Sultan Zainal Abidin (UniSZA). Formal ethical approval was obtained before data collection to ensure the protection and rights of all participants involved in evaluating the infographic module. All 73 students enrolled in the Ibn Aqil Syntax Text Study course were briefed that participation was entirely voluntary. They received a clear explanation of the research objectives before providing their informed consent. To maintain strict confidentiality and anonymity, no personally identifiable information was collected during the survey process. All digital data was securely stored in password-protected files accessible only to the researchers, ensuring compliance with institutional data protection policies.

3. Discussion

The demographic profile of the respondents is presented in Table 3. Based on Table 3, the gender analysis of the respondents indicates that a total of 16 respondents are male (21.9%), while the rest, namely 57 respondents, are female (78.1%).

Table 3

Demographic Profile of the Research Respondents

Gender	Frequency	Percentage
Male	16	21.9
Female	57	78.1
Total	73	100

3.1 Module Content

This section provides an item-by-item breakdown of the respondents' perceptions of the module's content. Table 4 presents the descriptive statistics of the questionnaire items.

Table 4

Descriptive Statistics for Module Content

	B: Module Content	Mean	SD	Interpretation
B1	Brief learning information.	4.55	0.782	High
B2	Learning information is organised.	4.71	0.612	High
B3	The language used is easy to understand.	4.68	0.574	High
B4	The exercises provided are appropriate to the students' level.	4.67	0.554	High
B5	Exercises related to the topic can test students' understanding.	4.66	0.558	High
B6	Content presented in graphic form facilitates students to understand it more easily.	4.70	0.660	High
B7	The content presented in graphic form is able to attract students' interest in learning Arabic grammar.	4.75	0.641	High
B8	The content of the module is appropriate to the allotted time.	4.66	0.606	High
B9	The content of this module can attract students to continue learning Arabic.	4.73	0.534	High
	Overall Mean	4.678	0.613	High

As shown in Table 4, students perceived the module's content at a high level, with a mean score of 4.678 and a standard deviation of 0.613. This suggests that according to the students, the module's content reveals a high degree of usability. The highest mean score was recorded for the item 'The content presented in graphic form can attract students' interest in learning Arabic grammar' (M = 4.75, SD = 0.641), followed by the item 'The content of this module can attract students' interest to continue learning Arabic.' (M = 4.73, SD = 0.613).

This is followed by the items 'Learning information is organised (M = 4.71, SD = 0.612)', 'The content presented in a graphic form facilitates students' understanding of the module more easily' (M = 4.70, SD = 0.660)" and 'Language used is easy to understand' (M = 4.68, SD = 0.574). These are followed by the item 'Exercises provided are according to the student's level' (M = 4.67, SD = 0.554). Next, two items documented a mean of 4.66, namely 'Exercises related to the topic of testing students' understanding' and 'The content of the module is appropriate to the allotted time.' The last item that documented the lowest mean compared to the other items was 'Brief learning information' (M = 4.55, SD = 0.782). Generally, all items documented high mean values.

3.2 Module Design

This section has an item-by-item analysis to obtain respondents' feedback about the module design. Table 5 indicates the mean score and standard deviation of each item in that aspect. As shown in Table 5, students rated the module design at a high level (M = 4.726, SD = 0.618). The item with the highest mean score is 'The type of writing is easy to read' (M = 4.79, SD = 0.552), followed by the item 'Variety of colours on graphics and text facilitates students to better understand the content' (M = 4.74, SD = 0.688), 'The text in the module can be read clearly' (M = 4.73, SD = 0.584), and 'The size of the text is suitable for reading. (M = 4.73, SD = 0.629). The item 'The colour used can attract attention' recorded the lowest mean score compared to the other items, which is M = 4.66, SD = 0.671. Overall, all items recorded a high mean value.

Table 5

Descriptive Statistics for Module Design Analysis

	C: Module Design	Mean	SD	Interpretation
C1	The graphic design is interesting.	4.71	0.589	High
C2	The text in the module can be read clearly.	4.73	0.584	High
C3	The colours used can attract attention.	4.66	0.671	High
C4	The size of the text is suitable for reading.	4.73	0.629	High
C5	The type of writing is easy to read.	4.79	0.552	High
C6	A variety of colours on graphics and text facilitates students better understand the content.	4.74	0.688	High
	Overall Mean	4.726	0.618	High

3.3 Module Usability

This section has an item-by-item analysis to obtain respondents' feedback on the usability of the module. Table 6 indicates the mean score and standard deviation of each item in that aspect. Based on Table 6, the interpretation of the data indicates that the usability aspect of the module is at a high degree, which is at an overall mean value of 4.694 and a standard deviation of .626. The items 'The module is divided into chapters, making learning more focused,' 'The feedback found in the exercises motivates the students', and 'Students obtain immediate feedback after completing the exercises provided' recorded the highest mean score, which was 4.73. Next followed by 'This module can be accessed at any time' ($M = 4.71$, $SD = 0.612$) and 'Students are allowed to practice repeatedly to improve understanding' ($M = 4.71$, $SD = 0.589$). The item 'Instructions for using the module are clear and easy to understand' recorded a value ($M = 4.70$, $SD = 0.594$), followed by the last item, 'Exercises are easily accessible by scanning the QR Code, and links provided' ($M = 4.55$, $SD = 0.817$). All items recorded a high mean value.

Table 6

Descriptive Statistics for Module Usability

	D: Module Usability	Mean	SD	Interpretation
D1	Exercises are easily accessible by scanning the QR Code and links provided.	4.55	0.817	High
D2	Instructions for using the module are clear and easy to understand.	4.70	0.594	High
D3	The module is divided into chapters to make learning more focused.	4.73	0.584	High
D4	The module can be accessed at any time.	4.71	0.612	High
D5	The feedback in the exercises inspires students.	4.73	0.584	High
D6	Students are allowed to exercise continually to enhance understanding.	4.71	0.589	High
D7	Students obtain instant feedback after finalizing the exercises.	4.73	0.607	High
	Overall Mean	4.694	0.626	High

3.4 Module Influence

This section has an item-by-item analysis to obtain respondents' feedback about the impact of the module. Table 7 indicates the mean score and standard deviation of each item in that aspect. Based on Table 7 below, the interpretation of the data indicates that the perceived impact aspect of the module is at a high degree, which is at an overall mean value of 4.642 and a standard deviation of .692. The item recorded the highest mean score, namely, the item 'Students can relate the content of this module to what has been learned' ($M = 4.68$, $SD = 0.621$), followed by the item 'Students can reflect on what they learned through this module' ($M = 4.67$, $SD = 0.688$). Then followed the items 'This module is suitable for independent learning' ($M = 4.66$, $SD = 0.711$) and 'Students can build their own understanding after using this module,' which recorded values ($M = 4.64$, $SD = 0.695$). Then, the item that recorded the lowest mean score compared to the other items was 'Students can perceive critically in understanding the content of this module' with a value of ($M = 4.56$, $SD = 0.745$). All items recorded a high mean value.

Table 7

Descriptive Statistics for Module Influence

	E: Module Influence	Mean	SD	Interpretation
E1	This module is suitable for independent learning.	4.66	0.711	High
E2	Students can relate the content of this module to what has been learned.	4.68	0.621	High
E3	Students can build their own understanding after using this module.	4.64	0.695	High
E4	Students can develop a critical understanding of the module's core content.	4.56	0.745	High
E5	Students can reflect on what they learned through this module.	4.67	0.688	High
	Overall Mean	4.642	0.692	High

4. Result

The results indicate that the infographic module is highly perceived as effective in learning Arabic grammar. This is consistent with previous studies that emphasize the importance of visual and interactive learning tools in addressing the

challenges of traditional *Turath*-based instruction. Although classical grammar texts such as *Syarah Ibn 'Aqil* are rich in content, they are often text-heavy. This problem can lead to cognitive overload and reduced learner engagement (Ahmad & Zainuddin, 2020). The findings reported in the present study also suggest that the infographic module is highly perceived as effective in reducing these challenges by turning complex syntactic explanations into concise, visually structured content. Thus, the module enhances student engagement and improves comprehension.

The students responded positively to the module's content and design. They have a positive perception of the color, typography, visuals, and structured layout. These findings reinforce the assumptions of Dual Coding Theory, where visual-verbal integration enhances memory encoding, and Cognitive Load Theory, which emphasises the reduction of extraneous load through structured visual design (Sweller, 1988). Previous research suggest that integrating visual signs, varied writing styles, and highlighted key points is a useful infographic strategy (Kalyuga, 2011; Mayer, 2017). The visuals can promote effective cognitive processing and information recall. The current study found that combining attractive graphic elements and relevant content increased students' desire to learn Arabic grammar. This outcome is similar to Noh et al.'s (2017) findings, which observed that engaging visuals enhances student interest and motivation.

The findings regarding the module's accessibility and usability support several previous studies (Othman & Ghazali, 2019; Rahman et al., 2021). These studies suggest that students have accepted interactive infographic modules as supplementary learning tools. This outcome demonstrates the significance of Technology-Enhanced Language Learning (TELL) in learning Arabic grammar. The current module's structure divides the content into chapters and provides clear instructions to students. This feature supports the flexible and independent learning principles highlighted by Lubis (2019). The module addresses overreliance on teacher-centered instruction (Mat Teh, 2010; Muhammad et al., 2006). It allows students to revisit and practice grammar concepts outside the classroom.

The students also perceived the current Arabic infographic module as highly useful. This outcome supports Basiron's (2012) findings that repetition and practice are vital in mastering language structures. The module's interactivity enables repeated exposure and reinforcement. This feature is crucial for understanding complex syntactic patterns found in *Turath* texts such as *Alfiyyah Ibn Malik* and its commentaries. The students' positive perceptions about the module's usability indicate that they can connect new visualized content to prior classroom learning. This indicates the module's potential to enhance learning Arabic grammar. The current study demonstrates that infographic instructional design provides a practical solution to the limitations of traditional *Turath*-based grammar teaching. The study highlights that infographics enhance learners' understanding and increase their motivation and perceived learning support. Several previous studies have reported similar outcomes (Alrwele, 2017; Murzyn et al., 2024; Dunlap & Lowenthal, 2016).

Overall, the findings indicated that students were highly satisfied with the module's usability, design, content, and perceived pedagogical influence. The results revealed that the infographic module successfully met students' expectations by transforming dense *Turath*-based grammar into an accessible, engaging, and flexible learning experience. By aligning with positive learner perceptions across all measured constructs, the module demonstrates its viability as an effective tool for Arabic grammar instruction. The current study contributes to the limited body of research on the integration of infographic-based learning within classical Arabic grammar instruction, particularly in the context of *Turath* pedagogy in Malaysian higher education. Despite this contribution, several limitations should be acknowledged. First, this study is limited to a specific cohort within a single institution, which may affect the generalisability of the findings. Additionally, the reliance on cross-sectional, self-reported quantitative data may introduce response bias. Future research is recommended to extend the application of the module across different courses, institutions, and educational levels. Comparative studies involving alternative instructional approaches, as well as longitudinal and qualitative investigations, would provide deeper insights into the module's effectiveness and its impact on students' actual learning outcomes. Moreover, the study relied on perception-based data that captured students' subjective experiences. Finally, the research did not include an experimental comparison or control group to measure quantitative knowledge gains. Future studies should employ experimental or quasi-experimental designs with pre- and post-tests across multiple universities to validate the module's impact on academic performance and learning outcomes.

5. Conclusion

This study developed and validated an infographic-based module to support Arabic grammar learning within the Bachelor of Arabic Studies programme, focusing on the *Ibn Aqil Syntax Text* course at Universiti Sultan Zainal Abidin (UniZA). The findings indicate that students demonstrated high levels of satisfaction across all evaluated dimensions, including usability, design, content, and perceived impact. These results suggest that the module effectively meets students' learning needs and expectations, while enhancing engagement and comprehension of complex grammatical content. The module represents a valuable addition to the existing instructional resources for Arabic grammar at UniZA, particularly in supporting students enrolled in *Turath*-based courses. Furthermore, this study contributes to the growing body of educational research by providing empirical evidence on the effectiveness of infographic-based learning in higher education. The module's accessibility, visual clarity, and structured design highlight its potential to enhance digital learning resources and promote more flexible and engaging teaching and learning practices. The findings also suggest potential implications for Arabic language education policy and curriculum development in Malaysia, particularly in integrating visual pedagogical approaches into traditional grammar instruction.

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Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

Mohd Fauzi Abdul Hamid: Conceptualization; Methodology; Visualisation; Writing - Original draft; Resources; Validation

Muhammad Sabri Sahrir: Conceptualization; Writing - Review & editing

Mohd Firdaus Yahaya: Methodology; Resources; Writing - Review & editing

Shaferul Hafes Sha'ari: Writing - Review & editing

Isyaku Hassan: Writing - Review & editing

Khadijah Yusop: Formal analysis; Data curation, Resources

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