

The effect of the infographic display style on learning and retaining the vocabulary of the Noble Quran

Majdi Sulieman AlMashaleh

Department of Primary Education, Faculty of Education, Arap Open University, Amman, Jordan

Article Info

Article history:

Received Aug 21, 2022

Revised Nov 18, 2022

Accepted Dec 11, 2022

Keywords:

Animated style

Fixed style

Infographic display styles

Interactive style

Vocabulary of the Noble Quran

ABSTRACT

The study aimed to reveal the effect of the infographic display style (fixed, animated, and interactive) on learning and retaining the vocabulary of the Noble Quran among third grade students. The study sample consisted of 112 male and female third grade students and were distributed into three groups the students' learning test was designed to learn the vocabulary of the Noble Quran according to the approved standards, and a quasi-experimental design was used. The results showed that all infographic patterns (fixed, animated, and interactive) have an impact on learning the vocabulary of the Noble Quran, but this effect is not equal between the patterns, the most influential is the interactive pattern, then the animated pattern, then the fixed pattern, and the results showed that the three patterns (fixed, animated, and interactive) had an impact on retaining learning the vocabulary of the Noble Quran, and that there were no differences between the three patterns in retaining learning the vocabulary of the noble Quran, and the study indicated to a set of recommendations, including encouraging teachers to employ multiple methods in teaching the vocabulary of the Noble Quran.

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Corresponding Author:

Majdi Sulieman AlMashaleh

Department of Primary Education, Faculty of Education, Arap Open University

Amman, Jordan

Email: m_mashaleh@aou.edu.jo

1. INTRODUCTION

Vocabulary learning is one of the basic components of learning development in general and learning the Noble Quran in particular. Where the Quranic vocabulary is the focus of attention of researchers in the field of Quranic sciences. Vocabulary is one of the Quranic sciences of particular importance. It reveals the meaning of the word used in the verses of the Noble Quran, which is carefully selected, and not understanding the meaning of the vocabulary of the Noble Quran leads to closing the door to reflection, understanding, and knowing the systems of the verses and the surah.

Lessard [1] indicated that learning vocabulary is one of the thorniest issues in education. Accordingly, scholars and researchers in the field of Quranic studies have developed dictionaries for the vocabulary of the Noble Quran. It includes a lexicon for human words in the Quran, a lexicon for animal words in the Quran, and a lexicon. For the words of time in the Quran, a lexicon for the words of the universe contained in the Quran, a lexicon for the words of artifacts in the Quran, a lexicon for the words of place in the Quran, a lexicon for the words of tribes, nations, and peoples in the Quran, a lexicon for words of morality in the Quran, and a glossary of commercial and financial terms in the Quran.

One thing that indicate the importance of vocabulary learning is that it helps in learning basic language skills. Hilal study [2] showed a strong and positive relationship between vocabulary knowledge and language skills and reading and listening skills are among the basic skills in learning the Noble Quran. Also,

that it helps in understanding the language, and study by Ahmed [3] indicated the importance of knowing the significance of the vocabulary of the Noble Quran and employing it in developing the linguistic repertoire of learners, and that the Noble Quran is characterized by its abundance of vocabulary, which can help to achieve this. It also helps to understand the text being read. Abdullah and Abdulaziz [4] has shown a strong relationship between vocabulary learning and the general ability to comprehend the text read, and that learning the Quranic vocabulary is the first key to understanding the Noble Quran. Also, learning vocabulary helps develop students' communication process. Mosleh [5] indicated that without sufficient vocabulary, students cannot understand others or express their own ideas. Therefore, developing sufficient knowledge of vocabulary allows them to communicate effectively.

Here comes the role of the use of educational technology in strengthening teaching methods and confirming their effectiveness, because the means help to improve the level of teaching and raise students' interest in the subject and its learning. Pictures are a very important means of clarifying and simplifying information in the curricula at various educational levels, especially in the early stages of school education, due to the interest and passion of students at this stage with pictures, colors, and illustrations. Since there are about 70% of the sensory receptors present in the eyes, and that 90% of the information transmitted to the brain is visual information. The brain's processing of graphic information is less complicated than its processing of raw texts, and one of the most important reasons why the brain processes graphic information about 60,000 times faster than text data is that the brain deals with the image at once while it deals with the text in a linear, successive manner [6].

The brain region in the brain consists of two hemispheres (right and left). The right hemisphere handles coordination, colors, imagination, daydreams, dimensions, melodies, sounds, feelings, and drawings, while the left hemisphere is responsible for processing words, numbers, calculations, logic, analysis, arrangement, and sequential thinking [7]. Accordingly, the infographic can address the two sides of the brain in a balanced manner, as it is made up of the terms information and facts, and (graphic), which means imaging; That is, it is a representation of the data. It can be defined as "converting textual content into graphics, shapes, and images, which helps to understand the content and develop visual thinking skills."

It can help link logical information and graphics and help present complex information in an easier and faster way to understand the brain. It can provide important and effective educational means for students. Also, it may be one of the most attractive means of presenting the information. and the visual elements at the same time and thus they fall into the focus of attention where the linguistic and non-linguistic systems converge [8].

The skill of understanding the Noble Quran is one of the basic skills in learning the Noble Quran. One of its sub-skills is the skill of understanding the vocabulary included in the Quranic verses, while the study by Ahmed [3] indicated the weakness of students' learning of vocabulary and the necessity of taking measures to improve and help students understand vocabulary in a better way. Ali *et al.* [9] find that students have difficulty remembering vocabulary. Therefore, providing effective methods of vocabulary learning is more valuable than teaching students a large amount of vocabulary, and one of the problems to be solved in teaching vocabulary in schools is the relatively limited number of vocabulary teaching methods. The study by Althibyani [10] indicated that the infographic has become one of the important tools in the production of effective electronic content that attracts the attention of users quickly and can tell them a large amount of information in a quick and easy way (watching instead of reading). It suggests new methods for using infographic technology in education for its effectiveness in accelerating learning time and retaining it in long-term memory.

Bavi [11] stated that students are tired of learning vocabulary by traditional methods such as practicing or writing words on paper or learning passively through teacher explanations. This has led to serious problems with their learning skills. Alkaleda [12] emphasized the importance of the infographic in teaching new vocabulary.

The researcher, through his specialization in the field of teaching Islamic education, has noticed that teaching Quranic vocabulary is not given sufficient attention by the teachers of the Noble Quran. There is a significant weakness in the methods of teaching vocabulary, and that there are challenges in this regard facing those engaged in the educational field in teaching the Noble Quran considering that vocabulary is the basis for learning to understand the Noble Quran [12]. Using infographics is a great way to explore vocabulary as they are key to facilitating language, and vocabulary teaching strategies to facilitate learning. Besides, the different studies in determining which infographic patterns are more effective in developing the various dependent variables, as it has been proven.

Based on the foregoing, the problem of the current study is determined in the study of "the effect of the infographic display style (fixed, animated, interactive) on learning and retaining the vocabulary of the Noble Quran among third-grade students." The term infographic is a combination of two terms: "Information," which means information and facts, and "Graphic," which means depiction. Therefore, it

means data imaging. There are also other names for infographics, which are information design and interactive graphics (data visualization).

Al-Soub [13] defined it as "transforming textual content into different graphics, shapes, and images, which helps to understand the content and develop visual thinking skills. While Damyanov and Tsankov [14] defined it as a visual representation within a search flow that contains many images, infographics, shapes, and texts in a logical sequence through preparation. Uones [15] has indicated that it is a term derived from two words, information, and pictures, and it means graphic information or visual representation of information. Alwany [16] defined it as a modern educational means to clarify educational content in an easy and simple way by making texts in the form of graphics and shapes to simplify the idea for the learner and thus contribute to increasing and enriching the content. Based on the previous definitions, the infographic consists of three elements: i) The visual component: includes the use of colors, graphics, arrows, automatic shapes, and charts; ii) Text content: includes written texts that should be brief and related to the previous element; and iii) Knowledge: It is a method presented in a certain way that represents the concept of knowledge to be communicated, such as chronology, branching, and others.

There are many different classifications of infographics, and infographics can be categorized in terms of presentation style into three styles [17]. Fixed infographic: The Quranic vocabulary is presented in the form of pictures, drawings, arrows, and fixed texts, and it is either printed, distributed, or published on the internet, which is the most common pattern for ease of learning. One of the advantages of this style is the relative ease of preparation compared to other types and the ease of sharing if it is published via websites due to its speed of loading, as this would increase the lifespan of the design [18]. It also leads to the development of learners' abilities to visualize and organize ideas and helps them to understand and perceive the texts they read and helps to develop the abilities to read the text critically and develop their abilities to understand vocabulary and grammar associated with learning new languages [19]. Studies have indicated the impact of this style on various aspects of learning, including: i) Developing visual thinking skills [14]; ii) Improving the level of academic achievement in different academic subjects [20]; iii) The development of spatial thinking skills [21]; iv) The development of inferential thinking, as indicated by the study of Abdulaziz [22]; and v) The development of language skills [23].

Animated infographic: Where the Quranic vocabulary is presented in it through animated graphics that attract the recipient all the time, and this style requires a lot of creativity and the selection of expressive movements that help to produce it in an interesting and enjoyable way, so it is less widespread compared to the first style. Most of this style includes an audio component (e.g., sound effects, voiceover). The study of Shawky [24] examined the advantages of the animated infographic and concluded that it is characterized by its ease and sharing through social networks, its applicability to different disciplines and fields, and stimulates students' motivation and motivates them to learn the presented content, as well as allows diversity and renewal in the activities provided, which contributes to the treatment of individual differences. It helps to train and activate their senses, increases their exposure to the material, and helps to organize ideas and compare information in an effective and exciting way.

Interactive infographic: The Quranic vocabulary is displayed in it by developing multiple layers of data in one interface. The beneficiary controls the information he wants to display and read buttons by pressing or touching designed in an attractive interactive way, such as the display screens in museums that display information about an animal or place. This pattern is represented in giving the student the ability to choose information, search for content, answer a question, and so on. It is the most complex pattern in the production process and requires programming knowledge to create it in some cases. Since this pattern is not printed, it is easy to reproduce, which provides the content publisher with the ability to provide more interesting information and allows the data to be updated as needed. This pattern can allow the viewer to enter the data in the infographic to personalize their perceptions [25].

There is a difference in the results of the studies that examined which infographic patterns are more effective in developing the various dependent variables related to the learning process. These studies can be classified according to the following: i) Studies that showed the superiority of the animated infographic pattern over the fixed infographic pattern [26]; ii) Studies that showed the superiority of the fixed infographic pattern over the animated infographic pattern [27]; iii) Studies that showed the superiority of the interactive infographic pattern over the fixed and animated patterns [25]; iv) Studies that showed that the three patterns have the same positive effect, and there are no differences between them in that [28].

Learning vocabulary alone is not enough to have a successful learning process unless learners retain the vocabulary learning in their long-term memory. They will not be able to successfully practice learning and comprehension of the read text. Vocabulary retention is an essential component of learning [29]. It is necessary for teachers to be aware of the effectiveness of the most effective methods and methods for retaining vocabulary learning, and here Bavi [11] suggests using infographics to help students retain learning

new vocabulary. The study Desouky [8] indicated that the infographic enhanced students' retention of information and the ability to recall it.

The problem of the current study is determined by answering the following questions: i) What is the effect of the infographic display style (fixed, animated, interactive) on learning the vocabulary of the Noble Quran among third-grade students? ii) What is the effect of the infographic display style (fixed, animated, interactive) on the retention of learning the vocabulary of the Noble Quran among third-grade students? While this study seeks to verify the following hypotheses: i) There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of the infographic display style (static, animated, interactive) on learning the vocabulary of the Noble Quran among third grade students; ii) There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of the infographic display style (fixed, animated, interactive) on the retention of learning the vocabulary of the Noble Quran among third grade students.

2. RESEARCH METHOD

2.1. Research design

To verify the test hypotheses of the study, the quasi-experimental methodology was chosen, of the type of designs for unequal groups with a pre-and post-test. This type is the one that fits with the absence of random assignment, as a key element to control the pre-test through the design and achieve parity between the experimental groups. It also to study the effect of the independent variable which is the pattern of displaying information through the infographic (fixed, animated, and interactive), and verifying its impact on the dependent variables, represented in students learning the vocabulary of the Noble Quran, and keeping this learning. Figure 1 shows the design adopted in the study.

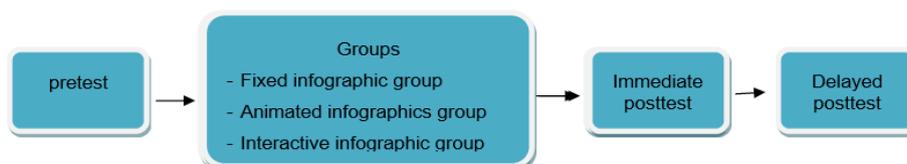


Figure 1. The design adopted in the study

2.2. Participants

The study members were selected from the third-grade students in the schools affiliated to the Directorate of Education of the District of Marka, and the school was chosen intentionally for the following reasons: i) A few third graders are available in this school to conduct the study; ii) Availability of experienced teachers who teach students in these classes and who are willing to cooperate; iii) Availability of sufficient capabilities to implement the intended teaching in the school; and iv) The school administration expresses its willingness to cooperate with the researcher. The study members were randomly selected from this school, and the study sample amounted to 112 students divided into three classes, and the classes were randomly distributed into the fixed infographic group of 38 students, the animated infographic group of 37 students, and the interactive infographic group of 37. Then the researcher conducted a group test before applying the teaching to ensure that the two groups were equal in terms of; the pre-test scores for understanding Quranic vocabulary and Table 1 shows the results.

Table 1. Numbers, means and standard deviations of the three groups

	N	Mean	Std. Deviation	Std. Error
Static	38	38.184	9.1618	1.4862
Animation	37	39.811	9.8709	1.6228
Interactive	37	38.811	9.8230	1.6149

It appears from Table 1 that there are differences in the averages between the three groups, and to find out the extent of this difference statistically, a one-way analysis of variance test was performed as in Table 2. The table shows that there are no statistically significant differences between the groups in the tribal measurement scores for learning Quranic vocabulary. Which means that the three groups are equal in the field of learning Quranic vocabulary.

Table 2. The results of the one-way ANOVA test to measure the differences

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	50.367	2	25.183	.272	.762
Within groups	10087.062	109	92.542		
Total	10137.429	111			

2.3. Infographic design stages

The Quranic vocabulary and its meanings were designed in accordance with the infographic according to the following steps: First is the stage of selecting the educational material. It consists of 8 lessons specialized in teaching the Noble Quran. Second is the stage of analyzing the educational material. It was found that it contains 28 Quranic words. Third is defining the objectives that the lessons seek to achieve. In this stage, determining the general outcome of the lessons "Learning the vocabulary of the Noble Quran included in the lessons of the Noble Quran in the book was done. The procedural outcomes were, after completing the lessons, the learner is expected to be able to: i) It comes with vocabulary close to the Quranic vocabulary in a different structure; ii) Puts general sentences containing the Quranic vocabulary; iii) It comes with words on the weight of the intended Quranic vocabulary; iv) Defines the dual Quranic vocabulary or group; v) Mentions the intended opposite of the Quranic vocabulary; vi) Replace the Quranic word with another that has the same meaning; and vii) Shows the meanings of the intended Quranic vocabulary.

Fourth the states the design stage where the educational content was reformulated to facilitate its visual translation. Fifth is production stage. In this stage, the following was done: i) Initial planning for the infographic. This was done using some sites (Piktochart), and according to the criteria indicated by the study of Alharby [30]; and ii) Graphic design programs such as Adobe Illustrator, VideoScribe, PowerPoint, and word processing programs have been used.

Sixth is the production stage. In this stage, a multimedia expert was hired to help design, especially in the field of interactive infographics, and the implementation was carried out according to the following steps: i) Adopting the criteria indicated by the study of Alharby [30] in the design; ii) The initial layout of the infographic by drawing the required paper; iii) Selecting the appropriate programs for graphic design, Adobe Illustrator, VideoScribe, PowerPoint, word processing programs, and websites (Piktochart) were selected; and iv) Implementation of the steps by the multimedia expert with the follow-up and supervision of the researcher.

Seventh is determining the educational activities. The activities are varied and 10 educational activities were used. Eighth adopt the study of Khalifa [25]. Which consists of three steps, according to the following: i) Exploration: to build broad background knowledge about diverse types of infographics; ii) The investigation: to show an understanding of how specific infographics represent information in both print and graphics; and iii) Integration: to integrate an infographic into a larger piece of writing

Ninth is determining evaluation methods. Several methods of evaluation were used, including a tribal, structural, and final evaluation. Tenth is the design validity of the lessons. It was presented to five arbitrators, with the aim of evaluating the design and obtaining its honesty. On the results of the discussion, the design was modified, and it came out in the final form. The Eleventh is about the design stability. The design stability was calculated by measuring the points of agreement and disagreement between the arbitrators on the design elements, and the percentage of agreement between them was calculated using the Cooper equation, and the calculated agreement percentage was 0.80. Which confirms the existence of a relatively acceptable agreement between the arbitrators on the validity of the design of the lesson for application.

2.4. Test learning the vocabulary of the Noble Quran

To answer the questions of the study, the researcher built the study tool represented in the achievement test for the vocabulary of the Noble Quran to measure the extent to which third-grade students learned the prescribed vocabulary of the Noble Quran, according to the following steps: First, determine the general outcome of the test, which is: measuring the extent to which students learn the vocabulary of the Noble Quran assigned to them. Secondly, the analysis of the educational content of the Noble Quran lessons and was done according to what was indicated in the construction of the design. Third, the development of procedural outcomes. Fourth is designing the specification table. Fifthly is placing question paragraphs based on the objectives for each of the lessons, and consisted of two questions on each of the procedural objectives, and therefore the number was 14 paragraphs.

Sixth is verifying the validity of the test. The validity of the test was confirmed in three ways: i) Apparent honesty, ii) Arbitrators' honesty; and iii) Honesty resulting from the ease, distinction, and effectiveness of alternatives: i) Apparent validity: The test has apparent validity due to the previous six

procedures, and all these procedures provide the content validity of the test; and ii) The validity of the arbitrators: The test paragraphs with objectives were presented to four arbitrators, and the test was modified based on the arbitrators' proposals (considering the writing of the alternatives in equal terms, and the modification of the formulas of some questions). The test settled on 14 paragraphs.

Seventh is the exploratory experiment of the test. The process where the researcher tried the test on the exploratory sample from the study community and from outside the sample consisting of 35 students, with the aim of calculating the differentiation coefficients. The discrimination coefficients were calculated for the test for the purpose of accepting or rejecting them, and as a result, the discrimination coefficients ranged between (0.33-0.75) and they are acceptable for the purposes of this research. Calculating the difficulty coefficients for the test paragraphs, as the difficulty coefficients ranging between (0.3-1.0) were adopted, and this is what the sample's answer was. Calculating the effectiveness of the alternatives, none of the alternatives was replaced based on the calculation of the effectiveness of the alternatives because they were effective. Estimating the test stability coefficient is to reach indications about the test's stability, the researcher estimated the test's stability by the internal consistency method, where the test was applied to the exploratory sample, and the stability coefficients for internal consistency were derived in terms of paragraphs statistics, using the (McDonald's' Omega) equation (ω), and it was the estimation of the stability coefficient according to this equation is (0.83). This indicates an acceptable degree of stability, which supports confidence in using the test to measure students' learning of Quranic vocabulary.

After the study tools were prepared, the teachers of the three classes were trained by the researcher on the method of teaching according to the three models for displaying the content (fixed, animated, and interactive infographics). It also to ensure that they know their role as teachers in the educational process. The three teachers taught by following up with and supervising the researcher, for a period of three weeks, with six lessons.

2.5. Data analysis

To answer the study questions, data was entered into the computer, and the SPSS was used. where the following was done, calculation of arithmetic means and standard deviations, for all results. Using the One-Way ANOVA test, ensuring that all conditions for conducting this test are met. Post-comparisons and the Scheffe' Test were used.

3. RESULTS AND DISCUSSION

3.1. First hypothesis

Which states: "There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of the infographic display style (static, animated, interactive) on learning the vocabulary of the Noble Quran among third grade students." Where the arithmetic means and standard deviations were extracted on the post-achievement test of the groups, as shown in Table 3. It is clear from the data in Table 3 that the average of the three groups is different for the students who learned the Quranic vocabulary. To find out whether these differences were statistically significant at the level of significance, the results were analyzed using the One-Way ANOVA test. Table 4 shows the results of the analysis of variance for the students' scores.

Table 3. Arithmetic means and standard deviations on the post-achievement test

	N	Mean	Std. Deviation
Static	38	71.3158	6.11646
Animation	37	75.2703	6.64015
Interactive	37	84.0541	5.75396

Table 4. The results of the one-way ANOVA test for the students' scores

	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	3176.377	2	1588.189	41.580	.000
Within groups	4163.400	109	38.196		
Total	7339.777	111			

It is clear from Table 4 that the calculated value falls in the rejection region. So, we reject the null hypothesis, and accept the alternative hypothesis that the mean of the three groups is different with statistical significance. To find out where the significant differences between groups are heading, the Scheffe Test was conducted, as shown in Table 5.

Table 5. Schiff's test for post-comparison examination of the three groups

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.
Static	Animation	-3.95448*	1.42741	.025
	Interactive	-12.73826*	1.42741	.000
Animation	Static	3.95448*	1.42741	.025
	Interactive	-8.78378*	1.43689	.000
Interactive	Static	12.73826*	1.42741	.000
	Animation	8.78378*	1.43689	.000

There are statistically significant differences between the averages of the group that learned by fixed and animated infographics, and in favor of the group that learned by animated infographics. There are statistically significant differences between the three averages of the group and in favor of the group that learned through the interactive infographic. As for the result of the first hypothesis in the study, which showed that the three types of infographic (fixed, animated and interactive) have a statistically significant effect on learning the vocabulary of the Noble Quran. The reason for this may be that the graph has attractive characteristics for students such as visual attractiveness and its ability to encode and summarize information visually, and what it shows in the attractive design. It can help students to link information and graphics, and also the ability of the image designed by infographic to operate every aspect of the brain (right and left), as indicated by the study of Asbi [6], and to the ability of infographics to provide the student with more clear, impactful and attractive information through images, graphics, figures and graphs compared to information based on abstract words only.

The analysis by Schiff's test showed that this effect on students' learning is not equal among the three modes (fixed, animated, and interactive) and that the most influential is the interactive pattern, then the animated pattern, then the fixed pattern. The reason for distinguishing the interactive infographic from the other two models (fixed and mobile) may be due to the ability of the interactive infographic that draws attention from the first moments, contains attractive visual elements that interact together to convey the educational message, leads the learners on an interesting visual journey and presents the educational content in the form of a narrative style. This is consistent with studies [10] that found that interactive infographic was more effective than other methods in teaching multiple subjects, but at the same time it contradicts the results of the studies [28]. It indicates that the three methods have the same positive effect, and there are no differences between them on students.

The study also clarified the distinction between the animated style and fixed infographic. It may be due to the distinction of the animated graphic style from the fixed infographic style to what this style includes from the movement and sound element (music, sound effects, audio commentary, or a combination thereof), and the importance of these elements (sound and movement) in students especially at this age - third grade. Which is what studies have shown [26] that the animated pattern was more influential than the stationary pattern, while this result contradicts the study [27] which indicated that the fixed infographic pattern is superior to the animated chart.

3.2. Second hypothesis

Which states that: There is no statistically significant effect at the level of significance ($\alpha \leq 0.05$) of the infographic display style (fixed, animated, interactive) on the retention of learning the vocabulary of the Noble Quran among third grade students. Where the arithmetic means and standard deviations were extracted on the deferred achievement test for the groups, as shown in Table 6. It is clear from the data in Table 6 that the average of the three groups on the delayed test is different for the students who learned the Quranic vocabulary. To find out if these differences were statistically significant at the level of significance, the results were analyzed using the One-Way ANOVA test. Table 7 shows the results of the analysis of variance for the students' scores on the delayed test.

Table 6. Arithmetic averages and standard deviations on the delayed achievement test

	N	Mean	Std. Deviation
Static	38	63.5000	8.35610
Animation	37	64.0811	8.12191
Interactive	37	66.0541	6.39855

Table 7. The results of the one-way ANOVA test for the students' scores

	Sum of Squares	Df	Mean Square	F	Sig.
Between groups	133.708	2	66.854	1.133	.326
Within groups	6432.149	109	59.011		
Total	6565.857	111			

It is clear from Table 7, the calculated value falls in the acceptance region, so we accept the hypothesis that there are no differences between the average groups in the retention of Quranic vocabulary learning. As for the result of the second hypothesis in the study, which indicates that there are no statistically significant differences between the averages of the three groups (fixed, animated and interactive) in the learning retention variable, which confirms that Students continued to retain learning even after a period of time had passed. This may be due to the fact that all students in the three groups were using the visual sense to learn. Which studies indicated its importance in helping to retain learning greatly, by giving a new visual form to display information. It is attractive to learners, and this may also be due to the increase in students' motivation to learn, which was shown by students during their learning. That is one of the important reasons as well as this helps to increase the retention of learning for a longer period. One of the possible reasons is also that students use new learning methods that will help to retain by learning, as well as increasing the students' understanding of vocabulary, as indicated by the study in its first question. It may have helped to increase their retention of learning. This result is consistent with what was indicated by study of Desouky [8] which indicated that infographic is a powerful tool in improving the level of information retention and recall ability.

4. CONCLUSIONS

Based on the results of the study, it is suggested to adopt the presentation of content to students by means of infographics in assorted styles on the topics of teaching vocabulary in general and teaching vocabulary in the Noble Quran in particular. That this method is applied in the presentation of educational content in other Islamic education topics such as jurisprudence topics, and others. It is also recommended that teachers be trained to incorporate this method into their content delivery methods. It is also suggested to develop scientific research in the field of employing infographic technology in other subjects of study and on other samples of school students.

REFERENCES

- [1] M. Lessard-Clouston, *Teaching Vocabulary*. Alexandria: Tesol Press, 2021.
- [2] M. O. S. Hilal, "The Effect of Interaction between Infographic Pattern 'Stationary Movement' in Flexible E-Learning Environments and Entwistle Model 'Surface - Deep - Strategic' in Improving some Learning Outcomes and Increasing Student Motivation Towards Learning (in Ara)," *The Refereed Scientific Journal of the Egyptian Association of Educational Computers*, vol. 8, no. 1, pp. 39–96, 2020, doi: 10.21608/eaec.2020.21614.1012.
- [3] N. S. M. Ahmed, "The interaction between the style of presenting educational content (infographic/ mind maps) and the cognitive style (approved/ independent) and its effect on developing educational communication skills among students of the computer teacher in the faculty," *Journal of the Egyptian Society for Educational Technology*, vol. 31, no. 1, pp. 3–63, 2021, doi: 10.21608/tesr.2021.148328.
- [4] A.-Q. S. Abdullah and A.-D. K. Abdulaziz, "Analysis of the linguistic needs of the Arabic language learners -speaking other languages- for religious purposes," *Journal of the Islamic University of Educational and Psychological Studies*, vol. 28, no. 5, pp. 947–970, 2020.
- [5] M. Mosleh, "The degree of application of the teachers of the basic circle in Jordan to the strategies of teaching Arabic vocabulary in the light of the ram," *Studies - educational sciences*, vol. 47, no. 2, pp. 631–647, 2020.
- [6] S. A. Asbi, "The effect of using the infographic strategy on the achievement of fifth grade female students, their attitudes towards science, and their motivation towards learning it," An-Najah National University, Palestina, 2015.
- [7] M. S. Al-Ghamdi, "The effect of demographic variables on the level of awareness of female mathematics teachers in the city of Riyadh of the infographic technique and the degree to which they possess the skills of its evaluation," *Journal of the Islamic University of Educational and Psychological Studies*, vol. 26, no. 3, pp. 128–158, 2018.
- [8] W. Desouky, "Patterns of color consistency 'mono-voice-analogue-triple' within an e-learning environment based on fixed infographics and their impact on developing visual thinking skills, achievement, and the survival of the learning impact of educational technology," *Egyptian Association for Educational Technology*, vol. 30, no. 3, pp. 237–340, 2020.
- [9] A. H. Ali, M. A. Khalifa, H. H. Amin, and A. R. Atta, "The impact of a proposed program in media education on developing the skills static infographics production among secondary stage students (in Arabic)," *Journal of Research in the Fields of Specific Education*, vol. 38, no. 8, pp. 544–571, 2022, doi: 10.21608/jedu.2021.76393.1345.
- [10] H. A. Althibyani, "The Impact of the Two Infographics Types in Terms of Presentation on Developing the Cognitive and Performance Aspects of Digital Graphics Design Skills and Motivation Towards them among Students of Educational Technology at The University of Jeddah," *Journal of Arts, Literature, Humanities and Social Sciences*, vol. 76, no. 76, pp. 132–155, Feb. 2022, doi: 10.33193/JALHSS.76.2022.641.
- [11] F. Bavi, "The Effect of Using Fun Activities on Learning Vocabulary at the Elementary Level," *Journal of Language Teaching and Research*, vol. 9, no. 3, p. 629, May 2018, doi: 10.17507/jltr.0903.24.
- [12] J. Alkaled, "Critical Appraisal of Infographics of Textbooks of Islamic Education in the Intermediate Stage in Saudi Arabia," *North Journal of the Humanities*, vol. 7, no. 2, pp. 733–741, 2022.
- [13] M. M. Al-Soub, "The effect of employing infographic-based learning in teaching history on developing visual thinking skills for eighth grade students," University of Jordan, 2021.
- [14] I. Damyanov and N. Tsankov, "The Role of Infographics for the Development of Skills for Cognitive Modeling in Education," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 13, no. 01, p. 82, Jan. 2018, doi: 10.3991/ijet.v13i01.7541.
- [15] S. Uones, "The Interaction Impact of Interactive Infographic Types and Mental Capacity Levels on Advancing Secondary School Teachers' Digital Video Production Skills (in Arabic)," *Journal of the Faculty of Education of Al-Azhar University*, vol. 41, no.

- 193, pp. 78–128, Jan. 2022, doi: 10.21608/jsrep.2022.228200.
- [16] R. Alwany, “The Effect of Using Infographics in Developing Life Skills in Science among Primary Stage Pupils,” *Journal of the Faculty of Education*, vol. 2, no. 3, pp. 249–268, 2022.
- [17] S. Sudarman, S. Sugeng, and H. Hairullah, “Development of Interactive Infographic Learning Multimedia on Study Methodology Study Course of Economic Education Program of Mulawarman University,” *JPP (Jurnal Pendidikan dan Pembelajaran)*, vol. 25, no. 2, pp. 51–64, Oct. 2019, doi: 10.17977/um047v25i12018p051.
- [18] A. S. Alrajhi, “Static infographics effects on the receptive knowledge of idiomatic expressions,” *Indonesian Journal of Applied Linguistics*, vol. 10, no. 2, pp. 315–326, Oct. 2020, doi: 10.17509/ijal.v10i2.28596.
- [19] U. M. Ibrahim and A. R. Alamro, “Effects of Infographics on Developing Computer Knowledge, Skills and Achievement Motivation among Hail University Students,” *International Journal of Instruction*, vol. 14, no. 1, pp. 907–926, Jan. 2021, doi: 10.29333/iji.2021.14154a.
- [20] N. Al-Rahili, “The effect of using infographics on improving the level of academic achievement in mathematics for second-grade intermediate students (in Arabic),” in *The Virtual International Conference on Education in the Arab World: Problems and Solutions*, 2021, pp. 43–59, [Online]. Available: <https://n9.cl/y2fnx>.
- [21] K. M. Gagnier, S. J. Holochwest, and K. R. Fisher, “Spatial thinking in science, technology, engineering, and mathematics: Elementary teachers’ beliefs, perceptions, and self-efficacy,” *Journal of Research in Science Teaching*, vol. 59, no. 1, pp. 95–126, Jan. 2022, doi: 10.1002/tea.21722.
- [22] A. Abdulaziz, “The effectiveness of using educational infographics in teaching history on developing historical concepts and deductive thinking among secondary school students,” *Journal of the Educational Society for Social Studies*, no. 131, pp. 89–132, 2021.
- [23] R. M. B. F. Bahjat, “The effectiveness of using educational infographics in developing the visual and language perceptual skills of the kindergarten child (in Arabic),” *Journal of Studies in Childhood and Education*, vol. 12, no. 12, pp. 134–200, 2020, doi: 10.21608/DFTT.2020.138364.
- [24] D. Shawky, “Animated Infographic, Journal of the Egyptian Association for Educational Technology,” *Egyptian Association for Educational Technology*, vol. 30, no. 3, pp. 3–16, 2020.
- [25] A. Khalifa, “The effect of presenting ‘fixed / animated / interactive’ educational infographic patterns on developing the concepts of digital citizenship among secondary school students and their attitudes towards it (in Arabic),” *Journal of Educational and Psychological Sciences*, vol. 14, no. 5, pp. 501–584, 2020, doi: <https://doi.org/10.21608/jfust.2020.120501>.
- [26] M. O. S. H. Hilal, “The effect of the interaction between the infographic style (fixed / mobile) in flexible e-learning environments and the Infuse model (surface, deep, strategic) in improving some learning outcomes and increasing students’ motivation towards learning (in A),” *Journal of the Egyptian Association for Educational Computers*, vol. 8, no. 2, pp. 39–96, 2020, doi: <https://doi.org/10.21608/eaec.2020.21614.1012>.
- [27] M. Afifi, “The interaction between the two types of ‘fixed and mobile’ infographic design and the two e-learning platforms ‘Blackboard and WhatsApp’ and its impact on developing visual learning design skills and realizing its elements,” *Education Journal for Educational, Psychological and Social Research*, vol. 188, no. 1, pp. 285–339, 2018.
- [28] M. A. Al-Dahab, “Designing a web-based learning environment based on fixed (vertical-horizontal) infographics and its impact on developing user interface design skills for students of the Department of Information Science, Twenty-fourth Conference: Big Data and its Invest.” Specialized Libraries Association, Arab Gulf Branch, pp. 1–39, 2018.
- [29] A. Bader, “The Effectiveness of Using PAVE Strategy on Learning English Vocabulary and its Retention among Eleventh Graders,” Islamic University, Gaza, 2018.
- [30] J. Alharby, “Suggested Framework to Improve the Employment of Infographics in the Teaching of Sharia Courses from the Point of View of Teachers of Sharia Sciences in Secondary Schools (in Arabic),” *IUG Journal of Educational and Psychology Sciences*, vol. 31, no. 1, pp. 201–230, 2022, doi: <https://doi.org/10.33976/IUGJEPS.30.1/2022/8>.

BIOGRAPHY OF AUTHOR



Majdi Sulieman AlMashaleh     is an Associate Professor of Curricula and Methods of Teaching Islamic Education. In 2006, he joined the College of Education at the Arab Open University - Jordan. He wrote many research papers in the field of Islamic education methods, analysis and evaluation of curricula. He participated in many projects in developing Islamic education books, his research interests also include training teachers on methods and technologies for teaching Islamic education, methods of developing motivation to learn, and the legitimate rooting of Islamic education teaching methods. He can be contacted at e-mail: m_mashsaleh@moe.edu.jo.