Migration Letters

Volume: 21, No: 1, pp. 402-412

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

The Efficiency of the Electronic Mind Mapping Technique in Fostering Success and Inspiration for Learning Arabic among Students with Learning Disabilities

Dr. Hatem Alqudah[1], Dr. Mohamad Ahmad Saleem Khasawneh[2]

Abstract

This study explored the efficiency of using an electronic mind-mapping strategy in promoting achievement and motivation toward learning Arabic language among second-grade students with learning difficulties. A sample of (80) students with learning disabilities from (10) public schools in the Amman Governorate were involved in the study, which employed a quasi-experimental methodology. Each group of the study contained 40 students. An achievement test and a measure of motivation toward learning were prepared as instruments for data collection. The study's findings revealed that the experimental group's scores in the post-application of the accomplishment exam differed from those of the control group in a way that was statistically significant in their favor. In the post-test of motivation toward learning, the results indicated statistically significant differences between the scores of the experimental and control groups, favoring the experimental group.

Keywords: *electronic mind maps, achievement, motivation, learning, learning difficulties.*

1. Introduction

The subject of learning difficulties is one of the recent topics. Interest in people with learning difficulties has increased in particular because this group suffers from learning difficulties, even though its individuals are normal in their auditory, mental, motor, and visual development, they face educational problems such as delayed speech or use of language and weak auditory and visual perception among individuals (Al-Rifai & Al-Zahrani, 2023). The technological developments in the current era have created changes and changes in educational policy that are linked to modern technology, which can help students in the learning process effectively, and provide an environment that pushes and motivates them to innovate and create. This is what created the name educational technology as a method and approach to thinking away from Indoctrination and memorization (Kamel & Hassan, 2023).

Many programs have emerged that employ technology in all educational and practical fields by integrating technology with the traditional learning method to achieve active learning and keep pace with modern developments, which has helped in the emergence of blended education. These programs are also concerned with integrating e-learning in all its types and forms and traditional education. Education Integrated into language teaching is distinguished by the possibility of using different methods, means, applications, and

[1] ALAin Universty. Hatem.alqudah@aau.ac.ae. https://orcid.org/0000-0002-5969-6729
[2] Special Education Department, King Khalid University (Saudi Arabia). mkhasawneh@kku.edu.sa, https://orcid.org/0000-0002-1390-3765

software that allow for the inclusion of video clips and audio texts and enhance motivation toward learning, in addition to providing freedom of time and place to carry out activities and provide the opportunity for dialogue, active interaction, and discussion (Banditvilai, 2016).

Electronic mind maps became popular in the era of technology and the great progress in learning and computer methods. The method of drawing mind maps, which are based on pen and paper, has changed to using a computer to design them, which helps teachers organize the information and knowledge they teach from concepts, principles, laws, etc., through words and drawings that are on the same page. The form of a map mixed with colours, shapes, and arrows contributes to organizing information and ideas in a tree or hierarchical system. The largest extent of the lesson's objectives, which are the topic of the map, are achieved using this strategy, which raises students' academic accomplishment and increases their enthusiasm to study (Mohaidat, 2018).

Academic achievement is an important indicator of the quality of the educational process. It is one of the important factors that greatly influence the formation of the learner's personality and facilitates his growth. Academic achievement is seen as a measure of what the learner has achieved and the experiences he possesses, as it measures the learner's abilities in expressing the skills, information, and attitudes. It is a standard through which we can determine the educational level of the learner and a source of appreciation and interest for him from those around him (Al-Jalali, 2016).

Motivation is the main driver of students' effectiveness, activity, and fruitful and diligent work, as the greater the enthusiasm, the greater the production, and the less loss of time, lack of production, and laziness. Therefore, it is necessary to find effective methods, strategies, and methods that contribute to supporting the learning and teaching processes, developing students' thinking, and focusing on goals that stimulate and develop. mental processes and arouse motivation toward science (Puspitarini & Hanif, 2019).

1.1. Problem statement

Learning difficulties are one of the ancient phenomena whose importance has recently become apparent among school students. Several school students suffer from a decline in academic achievement and motivation towards learning in one or more of the prescribed school subjects and the basic academic skills of reading and writing, especially in the Arabic language subject. Which is considered the basic language of communication between the student and society. The Arabic language is one of the ancient and living languages on the face of the Earth. It is the official language in all Arab countries and the language of the Holy Qur'an. Therefore, it is characterized by great importance in the lives of all individuals. The Arabic language has also greatly influenced many widespread languages because of its importance which distinguishes it from other languages. Therefore, there is a need to teach the Arabic language to all segments and groups of society, especially students with learning difficulties. This necessitated the use of different strategies, techniques, and methods for learning the language. Electronic mind maps are one of the important strategies because they are attractive and bring joy to learning, and their use leads to an increase in students' academic achievement combined with motivation towards learning the language.

1.2. Questions of the study

The study attempted to answer the main question, which states: "What is the effectiveness of the electronic mind mapping strategy in developing achievement and motivation towards learning the Arabic language among second-grade students with learning difficulties?"

The following research questions were derived from the main research question:

1. Are there apparent variations in the scores of the experimental and control groups in the post-achievement test in the Arabic language subject for second-grade students with learning difficulties?

2. Are there apparent variations in the scores of the experimental and control groups on a measure of motivation toward learning the Arabic language among second-year students with learning difficulties?

1.3. Objectives of the study

The aim of the study was to evaluate the efficiency of the electronic mind mapping approach in fostering accomplishment and motivation among second-grade children with learning challenges to learn the Arabic language.

The following sub-objectives emerge from the main question:

1. To find out whether there are significant variations between the scores of the experimental and control groups in the post-application achievement test in the Arabic language subject for second-grade students with learning difficulties.

2. To find out whether there are significant variations between the scores of the experimental and control groups on the measure of motivation towards learning the Arabic language among second-grade students with learning difficulties.

1.4. Significance of the study

This study provides an active learning environment that increases the activity and positivity of primary school students, and their participation in various educational situations, and provides an effective teaching strategy that helps increase academic achievement and also students' motivation toward learning the Arabic language. The study highlights the category of students who need special care and the use of different methods and strategies to achieve the learning process, who are the category of people with learning difficulties. The results might be useful for educational supervisors in directing Arabic language teachers during the service towards using the electronic mind mapping strategy. It may benefit teachers in improving teaching methods by activating the electronic mind-mapping strategy in teaching the Arabic language.

1.5. Study limitations

The current study was limited to (10) government schools affiliated with the Directorate of Education in Amman Governorate. The study was applied to (80) male and female second-year students with learning difficulties. The study was applied during the second semester of the year 2022-2023.

2. Literature Review

2.1. electronic mind mapping

Mind maps are one of the most important thinking tools that contribute to strengthening memory and retrieving information. Electronic mind maps are programs that can be used effectively and easily. The most important of these programs are FreeMind, Inspiration, MindMeister, and iMindMap, which is a group of computer programs. The electronic map works within the Windows suite and includes all the tools, including images, lines, shapes, and symbols, to facilitate the process of drawing the map in an accurate, standard way, which is the essence of designing electronic mind maps. Hussein (2022, p. 930) defined it as "one of the e-learning strategies to promote visual culture in an organized graphic form of information that stimulates remembering and thinking and includes a central concept from which ideas branch out through a computer program that combines images, colours, words, and symbols to summarize and coherently display information."

Al-Shardi and Al-Adeel (2018, p. 266) defined it as "a visual summary used to organize the concepts and ideas of the lesson and the relationships between them in a hierarchical manner, in which the general concepts are located at the top of the diagram and then another group of less comprehensive concepts is placed below it, using ready-made software that can be used to enter information and data easily. The drawings and tools available in the software can be used while providing the ability to display them to students." Abdul Karim (2016, p. 39) sees it as "a method of learning that includes free creative diagrams based on specialized computer programs, consisting of branches that radiate from the centre using lines, words, colours, and symbols, and are used to represent relationships between information and ideas and require spontaneous thinking when creating them."

Ramoud (2016) indicated that electronic mind maps are characterized by a set of features. It enables learners to search for information within it, by using hyperlinks between elements of educational content to achieve goals. It has a variety of stimuli that address all senses, such as texts and visual stimuli that help increase the mental abilities of learners. It contains many multimedia and complex media interacting with each other, such as images, sound, animation, video clips, and line drawings, and cohesion between them to achieve specific educational goals. It allows the learner to access information easily and conveniently by navigating within the content smoothly and moving from one screen to another, which supports interactive learning. It enables the learner to have the freedom to browse a large amount of displayed information with ease, ease of operation, and control of the display rate of the displayed content. The many links and nodes between the elements of the educational objects and the electronic mind map enable students to follow free branching paths and deal with every detail. Electronic mind maps provide elements of suspense and attraction to learners through shapes, colours, and interactive displays using computer programs designated for that purpose.

2.2. Motivation for learning

The educational process seeks to bring the learner to an acceptable level of development and growth, as it is an important and effective element in the educational process. This development and growth are linked to a large extent to the student's enthusiasm, inclinations, and motivation towards knowledge and science, as motivation constitutes a great concern on the part of those responsible for the educational process, including students, counsellors, and teachers, as it is the primary driver of individual behaviour.

Al-Sayyid and Hussein (2023, p. 9) defined it as "an internal force or inner feeling that moves an individual's behaviour and directs him to achieve a specific goal, which he feels a need for or its normal or moral importance to him, and thus the factors that push the individual to progress in his achievement can be identified." Ozqazou and Hamoudi (2017, p. 7) defined it as "the constant desire to strive for success and accomplish difficult tasks as a kind of challenge, and to overcome the problems and obstacles facing the individual with high efficiency, with the least possible amount of effort and time, and with the best level of learning." Wassas (2015, p. 11) defined it as "a state that prompts the student to be interested, desire to learn, pay attention to the educational situation, engage in it actively, and continue this activity until learning is achieved."

Al-Rufu (2015) indicated that many factors affect motivation towards learning. Learner control refers to providing a set of options for the learner to complete school assignments, taking into account the learner's background, abilities, and skills. Rewards are used if the learner does not have the desire to learn and this is done by giving simple and effective rewards. Learner interests refer to the teacher's use of a motivating and interesting introduction and asking many questions that stimulate students to think, which brings the subject closer to the learner's interests. Classroom environment is important, as, the teacher can diversify teaching methods and methods to evaluate the learners' grades and avoid criticizing them socially and scientifically in front of others. Learner initiatives and

self-reliance occur through the learner's participation in setting goals and encouraging him to contribute to setting the methods required to be followed in the educational process and study plans.

2.3. Previous studies

Al-Sanawi (2022) investigated how employing electronic mind maps might improve both immediate and delayed accomplishment as well as mental habits. It was founded on a semi-experimental methodology. The study sample included (58) second-year intermediate students in Saudi Arabia who were enrolled in the Tawhid course. The sample was split into two groups: the experimental group, which included 29 students, and the control group, which also included 29 students. Two instruments were designed. The study's findings demonstrated that electronic mind maps have an impact on fostering accomplishment and enhancing thought patterns, and that there are changes between pre- and post-applications of the achievement test and the scale.

Al-Otaibi and Al-Nafei (2022) looked at how gamification affected students' motivation to study mathematics. 35 female students from the second intermediate grade in the city of Taif made up the study's sample, which was based on a quasi-experimental methodology. A motivational assessment for learning mathematics was created. The study's findings demonstrated that there were disparities between the experimental group's and control group's scores on a test of learning motivation, favoring the experimental group.

Al-Kanaan (2022) found that adopting gamification improved female fifth-grade pupils' academic performance in science and enthusiasm to learn. The study's methodology was a quasi-experimental one. The study sample consisted of 35 female students, who were split into two experimental groups with 27 male and female students each. The remaining 26 female students made up the other experimental group. Both an accomplishment test and a test of learning motivation were created. The findings revealed statistically significant differences between the average scores of the experimental and control groups on the post-learning motivation scale, favoring the experimental group, as well as between the scores of the experimental and control groups on the post-achievement test, favoring the experimental group.

In the Qassim region, Al-Harbi and Al-Harbi (2022) investigated the efficacy of teaching chemistry using STEM educational kits to foster enthusiasm and creative thinking in secondary school pupils. The study sample included 53 students, and it was based on a quasi-experimental design. To gauge motivation for learning and assess creative thinking, a test was created. The findings demonstrated that there were statistically significant differences between the experimental and control groups' scores on the post-test of creative thinking in favor of the experimental group as well as between the experimental group's scores on the post-test of post-learning motivation.

The usefulness of employing electronic mind maps in fostering accomplishment was examined by Al-Imam et al. (2021). It was founded on a semi-experimental methodology. (60) Egyptian first-year secondary school students made up the study sample. Two groups—one experimental and the other control—were formed from them. The accomplishment exam was administered to each group of thirty childre0n, and the findings revealed a statistically significant difference favoring the experimental group on the post-achievement test.

Mahfoud and Al-Ahmad (2021) explored the effectiveness of using electronic mind maps in reducing cognitive load and improving achievement. It was based on the quasi-experimental approach. There were 44 male and female seventh-graders in Syria who made up the study sample. They were divided into two experimental groups, each of which had 22 male and female pupils. The achievement exam, the cognitive load scale, and the computer were used to create electronic mind maps. The findings revealed

statistically significant changes in the experimental group kids' accomplishment test scores pre- and post-application, favoring the post-application. The post-achievement test results of children in the experimental and control groups varied statistically significantly, with the experimental group scoring higher.

The Kahoot program's usefulness in fostering accomplishment and learning motivation was examined by Daradkeh (2020). The study's methodology was a quasi-experimental one. 50 pupils from Al-Harin's primary school's third grade made up the study sample. Two experimental and two control groups, each with 25 students, were created from the sample. Both an accomplishment test and a test of learning motivation were created. The outcomes revealed variations in the experimental group's average scores on the accomplishment test between pre- and post-application, favoring post-application. The study's findings also demonstrated that the students in the experimental group scored better in the pre- and post-application on the measure of motivation toward learning.

The effects of using electronic mind maps on learning motivation and level of technical and digital performance were highlighted by Ragab (2020). It was founded on an experimental methodology. (60) female students from Egypt's Zagazig University made up the study sample. The study's findings revealed statistically significant differences between the pre- and post-measurements in learning motivation, favoring the post-measurement, as well as variations between the pre- and post-measurements at the level of technical and digital performance.

Previous studies varied and differed in dealing with the study variables represented by electronic mind maps, achievement, and motivation toward learning. Al-Sanaawi (2022) addressed the effectiveness of electronic mind maps in developing immediate and deferred achievement and habits of mind, while Al-Imam et al. (2021) aimed to know the effectiveness of maps. Mahfoud and Al-Ahmad (2021) investigated the effectiveness of electronic mental maps in reducing cognitive load and improving achievement, and Ragab (2020) also aimed to reveal the effect of employing electronic mental maps on motivation for learning and the level of technical and digital performance. The current study is in line with previous studies in dealing with the electronic mind mapping strategy and its effectiveness in achievement and motivation. The difference is that previous studies dealt with other variables. This study was applied to students who suffer from learning difficulties. The current study dealt with a selected unit of the Arabic language subject, which is the mother tongue, unlike previous studies that dealt with different subjects. The current study combined three variables that were not addressed in previous studies: (electronic mind maps - achievement - motivation toward learning).

3. Methodology

Due to the nature of the study and the applicability of the quasi-experimental technique, the study sample was split into two groups (experimental and control). For the chosen classes, the experimental group received instruction utilizing electronic mind maps, whereas the control group received conventional instruction.

3.1. Sampling

The research was implemented during the second semester of the academic year 2022–2023 in ten schools in the Amman Governorate that are connected to the Ministry of Education. From the second basic grade at the chosen schools, (80) male and female pupils were randomly chosen to make up the study sample. The sample was split into two groups, one representing the experimental group—40 male and female students—who studied using the electronic mind mapping method, and the other representing the control group—40 male and female students—who studied using the traditional method.

3.2. Instrument of the study

First: the achievement test

A multiple-choice achievement test was prepared to measure the efficiency of the educational software in the achievement of second-grade students in the Arabic language subject, and three lessons were chosen: (Goodbye Grandpa, Zarifa and Peas, and Loyalty) for the topics prescribed in the Arabic language subject for second-grade students.

By submitting the information to a panel of knowledgeable arbitrators for their thoughts and comments, the legitimacy of the content was validated, and the reliability coefficient was (0.79).

The "Independent Samples t-test" was used to compare the average scores of the experimental and control groups prior to applying the achievement test in order to ensure that the experimental and control groups were equal. The results are displayed in the following table.

Table 1. T-test results for the differences between the scores of the experimental and control groups before applying the achievement test

Group	No.	Mean score	St. Dev	T value	Sig.
Experimental	40	7.93	2.105	.595	.554
Control	40	8.20	2.028		

The table shows that the value of the level of significance reached (.554), which is greater than (0.05), and this confirms that there is no difference between the experimental and control groups in the pre-achievement test in the Arabic language subject.

Second: Motivation towards learning

The scale to measure motivation towards learning the Arabic language was designed after reviewing the relevant literature and previous studies. The measure of motivation towards learning the Arabic language was designed, as the measure consisted of (20) items. To ensure the validity of the measure, a group of specialists and experts with specialization presented their comments for verification. The clarity of the instructions, the soundness of the linguistic formulation, the degree of its suitability for the study, and the opinions of the arbitrators were responded to. The stability of the instrument was also verified through the use of Cronbach's alpha coefficient, which reached (.764).

To verify the equality of the experimental and control groups in pre-test achievement, the "Independent Samples t-test" was utilized to compare the average scores of the experimental and control groups on the pre-learning motivation scale, and the results were as shown in the following table.

Table 2. T-test results for the differences between the scores of students on the motivation towards pre-learning scale

Group	No.	Mean score	St. Dev	T value	Sig.
Experimental	40	6.75	1.581	.832	.408
Control	40	7.03	1.368		

The table shows that the value of the level of significance reached (.408), which is greater than (0.05), and this confirms that there is no difference between the experimental and control groups in the measure of motivation towards pre-learning in the Arabic language subject.

4. Results and Discussion

4.1. Results of the first question

To answer this question, the Mann-Whitney test was used for two independent samples to compare the scores of the experimental and control groups in the post-application of the achievement test, and the results are shown in the following table.

Table 3. Results of the Mann-Whitney test for the difference between the scores of the students in the post-application of the achievement test

Group	No.	Mean rank	Sum of ranks	U value	Z value	Sig.
Experimental	40	57.05	2282	138	6.419	.000
Control	40	23.95	958			

The level of significance is (0.00), which is less than (0.05), according to the table. This ratio demonstrates that there are statistically significant differences between the scores of the experimental group, which used an electronic mind mapping approach to study, and the scores of the control group, which used a conventional study method, at the level of significance (0.01).

This is explained by the fact that electronic mind maps are characterized by a simple, uncomplicated, and dispersed educational climate, by displaying all information related to the topic on one map in front of the eyes of the students. Organizing lessons using this strategy helps to teach them comprehensively, and it helps students to see all parts of the map comprehensively. Interconnected and integrated, electronic mind maps link information using colours and graphics that work to increase students' attention, attract them, and excite them to focus on the material in their minds. The brain learns better when it uses the right and left sides, and this is what electronic mind maps achieved, as they combined Graphics, written information, and symbols. These results are consistent with previous studies (Al-Sanawi, 2022; Al-Kanaan, 2022; Al-Imam et al., 2021; Mahfoud & Al-Ahmad, 2021; Daradkeh, 2020).

4.2. Results of the second question

The following table presents the findings of the Mann-Whitney test that was used to compare the post-application Motivation to Learning Scale scores of the experimental and control groups for two independent samples in order to address this subject.

Table 4. Results of the Mann-Whitney test for the difference between the scores of the experimental and control groups in the post-application of the Motivation Towards Learning Scale

Group	No.	Mean rank	Sum of ranks	U value	Z value	Sig.
Experimental	40	59.43	2377	43	7.334	.000
Control	40	21.58	863			

The level of significance value in the table is (0.00), which is less than (0.05), indicating that there are statistically significant differences between the scores of the experimental group, which used an electronic mind mapping strategy to study, and the scores of the control group, which used a traditional study method. The pupils in the experimental group, who have the highest average, are favored by the post-application of the desire toward learning scale.

This is explained by the fact that the electronic mind mapping strategy takes into account the characteristics and nature of students with learning difficulties, stimulates students' motivation to participate, be active, and work in the learning process, and encourages students to use the self-learning method, which is an essential element in the learning

process. It also provides immediate feedback that contributes to enhancing answers. students and correct incorrect answers on an ongoing basis, which puts the students in a state of continuous activity and constantly searching for new ideas and solutions to solve the problems that guide them during the learning process. In addition, this strategy provides many stimuli that make the learning process more exciting for students' motivation to learn and takes into account the inclinations of Students and their preparations during classes and getting them accustomed to taking responsibility, which keeps them alert and interested. This result is consistent with (Al-Otaibi & Al-Nafi'i, 2022; Al-Kanaan, 2022; Al-Harbi & Al-Harbi, 2022; Daradkeh, 2020).

The study concludes that mind mapping is an efficient and effective tool used by teachers as it boosts and promotes the students' attention in the classroom. It allowed the students to interact with the presented materials and with each other. The findings also demonstrated a will among teachers to explore this strategy more and include it in their teaching styles.

5. Recommendations

The study recommends holding training courses for Arabic language labs and teachers at all educational levels, to train them on the use of electronic mind maps, and their application in diverse and different educational situations. It is recommended to ensure the training of Arabic language teachers on how to design and produce electronic mind maps, to benefit from the various possibilities for obtaining mind maps of high specifications. It is important to prepare and design electronic mind maps for all courses, including the Arabic language, and for all levels of study. There is a need to diversify the use of different educational strategies, including the strategy of electronic mind maps, in a way that suits the preferred educational styles of students at all educational levels. The study also recommends paying attention to educational strategies and methods that increase students' motivation towards learning, including students with learning difficulties, which improves their academic achievement.

Acknowledgments

The authors extend their appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through Large Research Groups under grant number (RGP.2 / 293 /44).

References

Abdul Karim, S. (2016). The use of electronic mind maps in teaching physics and its impact on developing spatial ability and scientific inclination among first-year secondary school students, Journal of the Faculty of Education - Assiut University, 32 (1), 26-121.

Al-Ghamdi, M., & Al-Hussan, A. (2017). The effectiveness of the reciprocal teaching strategy in developing an understanding of concepts for the project learning course for children and motivation to learn among female student teachers at Princess Noura bint Muhammad University. Journal of Educational Sciences - Imam Muhammad bin Saud Islamic University, 12, 207-266.

Al-Harbi, O., & Al-Harbi, A. (2022). The effectiveness of teaching chemistry using STEM educational portfolios in developing creative thinking and motivation towards learning among secondary school students. Journal of Educational and Humanitarian Studies - Damanhour University, 14(4), 75-132.

Al-Imam, W., Al-Sayeh, A., & Hani, Mt. (2021). The effectiveness of using electronic mind maps in developing achievement among secondary school students. Journal of Reading and Knowledge - Ain Shams University, 235, 191-213.

Al-Jalali, L. (2016). Academic Achievement (2nd ed.), Amman: Al Masirah House for Publishing and Distribution.

Al-Kanaan, H. (2022). The effectiveness of using gamification in academic achievement in science and motivation towards learning among fifth-grade female students. Journal of Educational Sciences - King Saud University, 34(3), 337-362.

Al-Otaibi, N., & Al-Nafi'i, R. (2022). The effectiveness of using an electronic gamification strategy on developing motivation towards learning the mathematics course among middle school female students. Arab Journal of Specific Education, 23, 599-534.

Al-Qahtani, Sa. (2021). The effectiveness of using the flipped learning strategy in teaching the teaching and learning course on cognitive achievement and the persistence of the learning effect and the trend towards distance learning among female students of the Early Childhood Department at the College of Education in Al-Muzahmiyah in light of the Corona pandemic. Journal of the Faculty of Education - Ain Shams University, 45(3), 187-244.

Al-Rifai, T., & Al-Zahrani, S. (2023). The extent of applying evidence-based practices in teaching mathematics to students with learning difficulties from the perspective of their teachers. International Journal of Educational Research, 47(1), 92-130.

Al-Rufu, M. (2015). Motivation models and applications. Dar Al Masirah for Publishing and Distribution.

Al-Sanaawi, A. (2022). The effect of using mind maps on developing achievement and habits of mind in the monotheism course among second-year intermediate students. Journal of Educational Sciences - Imam Muhammad bin Saud Islamic University, 31, 319-376.

Al-Sayed, A., & Hussein, I. (2023). The effectiveness of the flipped learning strategy in developing academic achievement and motivation towards learning mathematics among eighth-grade female students. Journal of the Faculty of Education - Alexandria University, 33(2), 173-197.

Al-Shardi, A., & Al-Adeel, A. (2018). The effect of electronic mind maps on achievement in computer skills among middle school students. International Journal of Educational and Psychological Sciences, 1(10), 255-351.

Banditvilai, C. (2016). Enhancing students' language skills through blended learning. Electronic Journal of e-Learning, 14(3), 223-232.

Daradkeh, H. (2020). The effectiveness of using the game-based learning program Kahoot in developing achievement and motivation towards learning among third-grade primary students in the Kingdom of Bahrain. Journal of Educational and Psychological Sciences - University of Bahrain, 21(4), 83-113.

Hussein, R. (2022). The effectiveness of using the electronic mind mapping strategy to develop future thinking for students of the Art Education Department. Journal of Architecture, Arts and Humanities, 10(4), 927-950.

Kamel, I., & Hassan, Y. (2023). The reality of employing educational technology in teaching the Arabic language. LARC Journal, 48(1), 726-757.

Mahfoud, M., & Al-Ahmad, A. (2021). The effect of using electronic mind maps in reducing cognitive load and improving achievement. Al-Baath University Journal - Educational Sciences Series, 43(4), 99-132.

Mohaidat, M. M. T. (2018). The Impact of Electronic Mind Maps on Students' Reading Comprehension. English Language Teaching, 11(4), 32-42.

Ozqazou, H., & Hamoudi, A. (2017). The effectiveness of educational physical sports activities in stimulating learning motivation among primary school students, unpublished master's thesis, Djilali University, Khamis Miliana.

Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. Anatolian Journal of Education, 4(2), 53-60.

Ragab, R. (2020). The effect of employing electronic mind maps on motivation to learn and the level of technical and digital performance in a discus throwing competition. Scientific Journal of Sports Sciences and Arts - Helwan University, 35(35), 1-25.

Ramud, R. (2016). The relationship between electronic mind maps (two-dimensional, three-dimensional) and learning style (pictorial, cognitive) in the smart learning environment and its impact on developing visual thinking. Journal of Arab Studies in Education and Psychology, 71, 59-134.

Sabra, J., & Al-Jadri, A. (2019). The effectiveness of teaching biology according to the electronic mind mapping strategy in achievement and attitude towards the subject among tenth-grade female students in Jordan. Journal of Educational and Psychological Sciences, 3(7), 73-92.

Wassas, A. (2015). The effectiveness of the Zahawik model in acquiring listening and speaking skills in light of the motivation towards learning the Arabic language among seventh grade students in Jordan, unpublished doctoral thesis, University of Jordan, Amman.