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The Impact of the Educational Scaffolding Strategy on Developing Scientific Concepts and Acquiring Basic Science Processes Among Kindergarten Children in Madaba Governorate

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Abstract: Objectives: The current research goal is to identify the impact of the educational scaffolding strategy in developing scientific concepts and the acquisition of basic science processes among the kindergarten children in Madaba Governorate. **Methodology**: The researcher employed a quasi-experimental design and applied the experimental curriculum to a sample of 49 children from Riyadh schools in the Madaba Governorate. The sample was divided into two groups: an experimental group consisting of 25 children who were taught using the educational scaffolding strategy, and a control group consisting of 24 children who were taught using the regular method. The research instruments included two tests: the first measured scientific concepts, and the second measured learning processes in the unit on living organisms. **Results**: The results of the study at the significance level of $\alpha = 0.05$ revealed the presence of statistically significant differences between the mean scores of the two research groups on the tests of scientific concepts and basic science processes, in favor of the experimental group. **Conclusions**: The results of the current research revealed that the strategy of educational scaffoldings has a positive impact on developing scientific concepts and acquiring the basic science processes of the kindergarten child. **Recommendations**: The researcher recommends based on the research results using the educational scaffolding strategy in other subjects and on other variables.

Keywords: Kindergarten Child, Educational Scaffoldings Strategy, Scientific Concepts, basic science processes.

أثر استراتيجية الدعائم التعليمية في تنمية المفاهيم العلمية واكتساب عمليات العلم الأساسية لدى طفل الروضة في محافظة مادبا

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ملخص: الهدف: هدف البحث الحالي إلى التعرف على أثر استراتيجية الدعائم التعليمية في تنمية المفاهيم العلمية، واكتساب عمليات العلم الأساسية، لدى طفل الروضة في محافظة مأدبا. **المنهج:** استخدمت الباحثة المنهج التجريبي القائم على التصميم شبه التجريبي وتطبيقه على عينة تتكون من (49) طفلا من مدارس الرياض في محافظة مأدبا، مقسمين الى مجموعتين: الأولى مجموعة تجريبية وعددها (25) طفلا درست باستخدام استراتيجية الدعائم التعليمية، والثانية ضابطة وعددها (24) طفلا درست باستخدام الطريقة الاعتيادية. وتكونت أدوات البحث من اختبارين الأول يقيس المفاهيم العلمية والثاني يقيس عمليات العلم في وحدة الكائنات الحية. **النتائج:** كشفت نتائج البحث عند مستوى الدلالة (α= 0.05) عن وجود فرق دال إحصائيا بين المتوسطات الحسابية لدرجات مجموعتي البحث في اختباري المفاهيم العلمية وعمليات العلم الأساسية البعدي لصالح المجموعة التجريبية. **الاستنتاجات:** كشفت نتائج البحث الحالي أن لاستراتيجية الدعائم التعليمية أثر إيجابي في تنمية المفاهيم العلمية واكتساب عمليات العلم الأساسية لدى طفل الروضة. **التوصيات:** توصي الباحثة استنادا إلى نتائج البحث باستخدام استراتيجية الدعائم التعليمية في مواد دراسية أخرى وعلى متغيرات أخرى.

الكلمات المفتاحية: طفل الروضة، استراتيجية الدعائم التعليمية، المفاهيم العلمية، عمليات العلم الأساسية.

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Introduction

The early childhood stage has an essential role in placing the first seeds to develop the child's personality, forming the path of comprehensive growth for him, and building a basis for his future. It prepares the child and develops his personality, capabilities, customs, trends, and preparations according to what the learning environment surrounding the child provides, and this requires following educational practices and methods based on studied scientific foundations, with the aim of providing an appropriate atmosphere and auxiliary environment that enables children to develop concepts and new skills to enhance the capabilities of the child and his capabilities and thus improve quality education.

The early childhood stage represents the period in which the individual is characterized by a feeling of curiosity and the search for knowledge that saturates this curiosity using his senses, which makes him discover what he learns and be an active participant in building knowledge, where studies have shown that early childhood is a decisive period in forming and building basic concepts and that the trends and habits that are implanted during this stage remain constant in the child and are difficult to change at a later time (Deghesh, 2023).

The importance of forming concepts in children stems from the fact that it is one of the factors that help them organize their experience, promote the growth of proper thinking, follow up on perceptions, link them to their sources, and prepare them for life (Zaitoun, 2015). Kindergarten in particular, because it helps children to explain many phenomena that excite, predict, and interact with them and thus lead to growth, passive thinking, and providing them with experiences and knowledge to prepare them for life, and also helps them to develop and modify their ideas and beliefs before reaching the levels of advanced classes of education (Peter, 2020).

The interest in shaping and developing concepts plays an important role in graduating a generation capable of facing problems and dealing with the changes of the times, and this requires searching for teaching strategies that help children learn, contribute to building the correct understanding of scientific concepts, enhance children's motivation to learn, as well as help them acquire basic science processes (Zeitoun, 2015).

The empowerment of children to acquire basic science processes is one of the goals of teaching science in kindergarten, as it is necessary to develop their scientific understanding and understanding, and on the other hand, Bruner notes that the acquisition of science operations is largely based on practice and continuous training, which contributes to the development of these customs educationally gradually. While Jani explains that these processes represent mental skills that are learned over time, as the child develops the ability to analyze information and thinking, thanks to the continuous interaction with the stimulating educational environment, and these skills expand the learning horizon through the direct experiences that children are exposed to, It enhances its deep understanding of concepts and contributes to enhancing its ability to make decisions in various situations (Baljun, 2015).

Constructivist learning theories emphasize the ability of children to learn and grow at this stage, which contributes to the way they learn and develop effectively in future stages (Trif, 2015). Constructivist theory is only a philosophical trend that emphasizes the active role of the learner in building his knowledge and understanding based on his previous concepts and experiences, which have a significant impact on enhancing his cognitive

structure and achieving effective learning (Zeitoun, 2015).

One of the theories of knowledge and learning that sees that knowledge grows through mediations and social negotiations between the teacher and the learner, and also between the learners themselves with the aim of building meanings and ideas called the social structural theory of the world Lev Fejutsky. Vygotsky is considered one of the most prominent thinkers, whose works have contributed to changing the understanding of the relationship between learning, culture, and social interaction. (Wibowo, Wangid, & Firstus, 2024). This theory starts from a major concept that knowledge is acquired through interaction with others within a common social and cultural context and not only through individual activity, and language plays a fundamental role in the transmission of educational experiences and improves the learning process (Churcher, Downs, & Tewksbry, 2014).

The basic principles of this theory indicate that social interaction helps learners to develop thinking skills and solve problems in an educational environment that encourages the exchange of ideas and experiences, and enhances knowledge building, and this interaction helps to provide support to students by interacting with a person with greater knowledge and experience, to help The learner to reach a higher cognitive level, which leads to the learner's acquisition of concepts, thinking skills and independence in learning (the region closest to development or growth (ZPD, the language also contributes through verbal interaction, the exchange of meanings and ideas in building knowledge, enhancing common understanding, developing the learner's knowledge structure, achieving a deeper understanding of concepts (Remorosa, Capili, Decir, Delacruz, Balaase & Escarlos, 2024).

The applications of social structural theory in teaching were also multiplied, and many teaching strategies, including the strategy of educational scaffoldings that are based on the idea that crystallized in the extent of students needing the beginning of their learning to support and assistance according to their needs, and then their dependence on this support gradually decreases until they are able to take responsibility for their learning and then move to a higher educational level by providing a soft, soft environment for learning (Larkin, 2002).

The pedagogical scaffolding strategy contributes to enhancing a deep understanding of scientific concepts, as well as helping them develop thinking and problem-solving skills, and over time, gradually reducing support enhances students' independence and increases their ability to learn independently (Trif, 2015).

Azih and Nwosu (2011) noted that the educational scaffolding strategy provides opportunities to develop the learner's mental skills and individual abilities by linking concepts and drawing conclusions, which helps him solve complex problems and critically evaluate information and facts.

Awodun (2024) defined educational props as the process in which the teacher provides temporary support to the learner to increase his motivation to learn and develop his skills independently and then gradually reduce the use of props, while Aditi (2017) defined it as the assistance provided by the teacher to the learner during the learning process to reach an advanced level of understanding and acquire skills that enable them to perform various tasks.

The educational scaffolding strategy aims to provide temporary support to the learner during the learning process so that this support gradually decreases, which enhances the learner's ability to self-learn and use knowledge to enhance the independence of the learner in

the future, in addition to enhancing social interaction and cooperation to contribute to the exchange of ideas and knowledge and promoting collective learning in the matter, which positively affects his understanding of scientific concepts, expands his knowledge, and develops his thinking (Wakhidah, 2017).

The educational scaffoldings are classified into the following types:

- Procedural Scaffoldings: It aims to help learners understand how to implement procedures related to concepts or study activities and guide them through the different stages of completing educational tasks.
- Conceptual scaffolding, which contributes to deepening understanding of new scientific concepts and linking them to previous experiences through the use of mind maps, graphs, and others.
- Process Scaffolding: aims to ask questions directed to the development of thinking and problem-solving.
- Meta-cognitive scaffolding: aims to assess sound understanding and self-control during the learning process.
- Strategic Scaffoldings: aims to motivate the learner to use higher thinking skills (Molenaar, Sleegers & van Boxtel, 2011).

The educational scaffolding includes several stages that aim to improve students' learning and enhance their ability to be independent as follows: Initial Guidance: At this stage, the teacher provides intensive support to students and guides them accurately during the performance of educational tasks. To ensure that students understand the procedures and steps of the study tasks presented to them.

Ongoing Support: At this stage, the teacher begins to gradually reduce support, as the teacher is content to provide less intensive guidance while allowing students to make some decisions themselves. With the aim of enhancing independence in learning. Self-Evaluation Phase At this stage, the teacher encourages students to self-evaluate their performance, with the aim of independently identifying their strengths and weaknesses.

Independence: In this final stage, the learner is able to carry out the educational activity on his own without the need for external support. With the aim of enabling students to apply what they have learned independently in the future (Lipscomb, Swanson, & West, 2004).

Therefore, the educational scaffoldings are one of the important teaching methods in early childhood because they effectively contribute to helping children understand and develop scientific concepts in a manner commensurate with their needs and their growth stage. Research shows that educational support enhances deeper understanding and the best results, which makes it an indispensable tool to create more interactive educational environments. 2012).

Early childhood teaching goals also focused on providing children with basic science processes, and it became a necessity in teaching science (Barqawi & abdul-Haq, 2020).

Due to the importance of educational scaffoldings in teaching, many studies have been conducted that dealt with the impact of applying this strategy on improving the science process in children, as these studies sought to reveal the impact of the use of this strategy in the development of scientific concepts in addition to its importance in acquiring science processes.

Literature Review

Syed (2024) conducted a study aimed at measuring the effectiveness of a program based on the strategy of educational scaffoldings to develop semantic memory skills in some biological concepts of kindergarten children and its impact on their acquisition of these concepts, and the sample consisted of 60

children and a child, and they were divided into two groups: an experimental group consisting of 30 children and a child and a group of control children and his child. The experimental curriculum was used for its suitability for the nature of the research, and the research tools were defined in the semantic memory skills measure of the biological concepts of the kindergarten child and the measure of the biological concepts of the kindergarten child, in addition to a program using the educational scaffoldings strategy. The results have resulted in the effectiveness of the program based on the educational scaffolding strategy in developing semantic memory skills in some biological concepts of kindergarten children and their acquisition of these concepts.

Labib and Basma (2022) examined the effect of using the educational scaffolding strategy in developing some universal concepts among children in early childhood. The study sample consisted of 41 children in Egypt; they were distributed into two groups: an experimental group consisting of 21 children who studied using educational supports and a control group consisting of 20 children who studied using the traditional method. The researcher used the semi-experimental curriculum using the design of the two groups. The results showed that there are statistically significant differences between the average degrees of the two groups to test the cosmic concepts of the kindergarten child, in favor of the experimental group, and the researchers recommended using the educational pillars strategy in teaching.

Barqawi and Abdul-Haq (2020) conducted a study aimed at describing the effectiveness of educational scaffolding strategies in developing basic scientific processes of kindergarten children in Jordan, and the sample consisted of (45) children and a child at a level of (5-6) years of the IEC Islamic Academy Kindergarten of the Ministry of Education in Amman; they were distributed to the two study groups: (22) children and children in the experimental group studied using educational scaffolding. Twenty-three children in the control group followed the regular method; the study tool was formed from the basic scientific processes for kindergarten children after making sure of its sincerity and stability. The results of the study showed that there is a difference in the average modified grades in the basic science processes test in favor of the experimental group that studied using the educational scaffolding strategy.

Moreover, Alsayed (2020) examined the use of educational scaffolding in forming physical concepts and developing scientific sense. The study sample included 30 children and children in Port Said, Egypt. They were divided evenly into two experimental and controlled groups. The physical concepts test and the scientific sense test were used, and the study concluded that the use of educational scaffoldings as a teaching strategy had a positive impact on the formation of physical concepts and the development of the scientific sense of children in the kindergarten stage.

Ejekwu and Inyon (2019) examined the impact of educational scaffolding strategies on students' performance in basic sciences and technology in government primary schools in Rivers State. The study used the experimental curriculum for its suitability for study; the study sample was formed from 147 chosen as a sample using the method of selecting the intentional samples. The data collection tool was a basic science and technology test. The data has been analyzed using an ANCOVA analysis. The results of the study revealed that there is a large difference in the average level of performance of basic science and technology for students who were taught using educational scaffolding strategies. Recommendations have been made that included using the educational scaffolding strategy in interaction between

teaching and learning in the classroom to enhance education and learning for students as well as improving their performance in all subjects.

Adity (2017) conducted a study entitled The Impact of Using the Educational Scaffoldings Strategy on Academic and Students 'Trends towards Science. The study sample consisted of 100 high school students in Batinda Province. One of the two schools was chosen as a control group studied in the traditional way, and the other as an experimental group studied using educational scaffoldings. To collect data, the academic achievement test and the direction scale were used, and the results showed that students who were taught using educational scaffolding strategies were much better than those taught by traditional ways. Students also developed a positive trend towards science when they were taught using educational scaffolding strategies.

In addition, Wakhidah (2017) conducted a study that aimed at assessing the use of educational scaffolding strategies (IMWR) on the scientific method to improve students' mastery of environmental concepts. The study was conducted in the Department of Primary Education on a sample of 12 students from Indonesia, and the researcher used the research curriculum based on one group. The data was collected by testing environmental concepts with pre-and post-tests. The results of the study resulted in the use of educational scaffolding strategies contributing to improving learning results and enabling students to effectively master environmental concepts.

Likewise, Baljon (2015) studied the effect of the use of educational scaffolding in the development of achievement and the skills of science operations among the first intermediate graders in Makkah Al-Mukarramah. The study sample consisted of 108 students, divided into 56 students in the control group and 52 students in the experimental group. The study tools consisted of the achievement test and test of learning processes. The results showed statistically significant differences between the average grades of the experimental group students, who studied using a strategy. Educational scales and average grades of students of the control group that studied using the traditional method of achievement and science operations for the experimental group, and the researcher recommended in light of the results that she reached to use educational scaffolding and train teachers on them.

Commenting on previous studies

By reviewing the results of previous studies, it was found that the current research is similar to previous studies in using the educational scaffolding strategy in the teaching process. The current research is also similar to the research (Al-Sayed, 2020; Barqawi & Abdul-haq, 2020; Labib & Basma, 2022; Syed, 2024; Wakhidah, 2017) in dealing with the variable of scientific concepts but differs from them in the type of concepts. The current research is also similar to the study of (Balgun, 2015) and) in the basic learning processes variable. This study is different form all previous research in dealing with the two variables together. Therefore, this research was conducted with the aim of investigating the impact of this strategy on developing scientific concepts and acquiring the basic learning processes of the kindergarten child in Madaba Governorate.

Research problem, questions, and hypotheses

The reality of education in kindergarten institutions faces many difficulties and challenges that may hinder children's learning. The results of this learning are often low, due to the monotonous and focused learning models on the teacher that limit the active participation by children, which are controlled by the focus on the traditional methods of teaching

(Khatibah & Faqihi, 2022), in addition to the lack of educational activities that focus on cognitive aspects. More than the emotional and immoral aspects of achieving the desired goals, this situation requires the necessity of developing education in all its stages, where Studies associated with structural theory indicate that learners need to be involved and active with educational materials to build and develop concepts and gain the skills of science and scientific thinking. This is not achieved by using traditional teaching methods that limit the thinking and creativity of learners and do not encourage them to interact with their environment (Zaitoun, 2015).

Based on these results, the researcher noted that there are real problems in kindergarten, which are the lack of kindergarten children in the skills of science processes that will be used to develop their concepts. Therefore, the researcher decided to face these problems using the strategy of educational scaffoldings and discover their impact on the development of concepts and the acquisition of basic scientific processes. Hence, the problem is to answer the following key question:

What is the impact of the educational scaffolding strategy on the development of scientific concepts and the acquisition of basic science processes among kindergarten children in Madaba Governorate?

In the context of the previous main question, the research seeks to test the following null hypotheses:

1. The first hypothesis: There is no statistically significant difference at the level of significance ($\alpha = 0.05$) between the averages of the experimental group and the control group in the development of scientific concepts attributed to the teaching strategy of the kindergarten child.
2. The second hypothesis: There is no statistically significant difference at the level of significance ($\alpha = 0.05$) between the averages of the experimental group and the control group in the acquisition of science processes attributed to the teaching strategy of the kindergarten child.

Research Objectives

The current research aims to reveal:

1. The impact of the educational scaffolding strategy on the development of scientific concepts among kindergarten children in Madaba Governorate.
2. The impact of the educational scaffolding strategy on the acquisition of basic science processes among kindergarten children in Madaba Governorate.

Significance of research

– The importance at theoretical level: The research deals with a modern teaching strategy, and it is considered one of the initial studies in Jordan within the limits of the researcher.

– The importance at the applied level: The research provides descriptive procedures for this strategy, which can provide kindergarten teachers the opportunity to use this strategy effectively. This research is also expected to improve the performance of parameters when adopting this strategy, which improves children's learning.

– The Importance at the research level: This research is a step towards generating more studies and research in other related scientific fields.

Research limits and limitations

Human limits: The current research was limited to kindergarten children in Madaba.

Time limits: The research was applied during the academic year 2023/2024.

Spatial limits: The research was applied in Riyadh schools in Madaba Governorate in Jordan.

Research Limitations: The results of the research are limited to the credibility of the research tools used, which aim to detect variation in variables related to the research.

Research Terms

Scientific concepts: Zaitoun (2015) defines it as everything that an individual has of meaning associated with a particular process. Procedural definition: The mark obtained by the kindergarten child in the test of scientific concepts in the unit of living organisms.

Basic science processes: It is a set of mental skills and processes that scientists use to access scientific knowledge (Olayan, 2022).

Educational Scaffolding Strategy: It is a set of stimuli taken from the learner's previous experiences, used by the teacher as temporary scaffolding to achieve the required level of learning (Al-Saidi, 2014). Procedural definition: It is a number of teaching procedures prepared by the kindergarten teacher, including activities and directions to help children complete tasks to achieve their learning independence.

Research Methods

The current research is based on the experimental approach with a semi-experimental design, as it was applied in a deliberately selected kindergarten school in Madaba Governorate.

Research variables

The research design includes the following variables:

Independent variables: Teaching strategy, which includes two levels:

1. Educational scaffoldings
2. traditional method

Dependent variables, including:

1. Development of scientific concepts
2. Acquisition of basic science processes

Research Sample

The research sample consisted of 49 kindergarten children in Riyadh schools in Madaba for the academic year 2023/2024. They were divided into two groups: an experimental group of 25 children taught using the educational props strategy and a control group of 24 children taught using the usual method.

Research Tools

First: Testing scientific concepts: The test consists of 15 items; it was presented to a group of arbitrators to verify its truthfulness, and a standard of 80% was adopted as a minimum to accept the paragraph, and the stability of the test was verified, as the value of the internal consistency coefficient between the test paragraphs was 86.0 using the Cronbach alpha equation.

Second: Basic science processes test: The test consists of 20 items; it was presented to a group of arbitrators to verify its truthfulness, and a minimum of 80% standard was adopted to accept the paragraph, and the stability of the test was verified, as the value of the internal consistency coefficient between the test paragraphs was 91.0 using the Cronbach alpha equation.

Research Procedures

- The validity and stability of the study tools were verified by applying them to an exploratory sample. - Selecting a kindergarten school and selecting two sections, one experimental and the other control, randomly.
- Apply research tools before and after experimental treatment.
- Discuss the results and come up with recommendations.

Statistical Analysis

The following statistical analyses were used: arithmetic averages, standard deviations, analysis of variance, and ETA squared.

Results

The first hypothesis: There is no statistically significant difference at the level of significance (α = 0.05) between the averages of the experimental group and the control group scores in the development of scientific concepts attributed to the teaching strategy of the kindergarten child.

The arithmetic averages and standard deviations of the kindergarten children's marks were extracted on the scientific concepts test as shown in Table 1.

Table (1): Arithmetic mean and standard deviations for testing scientific concepts.

group	number	Pre test		Post test	
		Arithmetic mean	Standard Deviation	Arithmetic mean	Standard Deviation
Experimental	25	7.183	2.106	13.752	3.016
control	24	7.375	2.114	8.731	2.981
Total	49	7.279	2.256	11.242	2.952

Table (1) shows a difference in the average scores of the two groups in the post-scientific concepts test, and therefore the accompanying variance analysis was used to know the significance of these differences as shown in Table (2).

Table (2): Analysis of the accompanying variance in the post-test of scientific concepts.

Variance	Sum of squares	Degree of freedom	Means of squares	F	significance	ETA Square	effect
Pre	1.124	1	1.124	0.174	0.679	0.004	
Teaching strategy	216.983	1	216.983	34.068	0.000	0.423	great
Error	304.030	46	6.469				
Total	518.500	48					

We conclude from Table (2) that there is a statistically significant difference at the level of significance (05.0 = α) for the value of 'P' (34.068) in the development of scientific concepts, and this difference was in favor of the experimental group, as indicated by the adjusted averages in Table (3).

Table (3): Adjusted averages of marks in the post-scientific concepts test.

group	number	Arithmetic mean	Standard error
experimental	25	13.125	0.729
control	24	7.942	0.617

To find the impact of the strategy on the development of concepts, the square of ETA² (η) was calculated and was equal to (0.423), which indicates that the educational props strategy explains about (42.3%) of the variance in favor of the experimental group.

Results related to the second hypothesis

Second hypothesis: There is no statistically significant difference at the level of significance (α = 0.05) between the averages of the experimental group and the control group scores in the acquisition of science processes attributed to the teaching strategy of the kindergarten child.

The arithmetic means and standard deviations were calculated on the basic science operations test, as shown in Table No. (4).

Table (5): Analysis of Variance Associated in the Test of Basic Learning Processes.

Variance	Sum of squares	Degree of freedom	Means of squares	F	significance	Square of ETA	effect
Pre	77.440	1	77.440	10.624	0.002	0.195	
Teaching strategy	116.438	1	116.438	16.405	0.000	0.262	great
Error	351.432	46	7.477				
Total	554.000	48					

As noted in Table (5), there was a statistically significant difference in the value of 'P' (16.405) in the test of basic science operations after it, and it was shown from the adjusted averages that this difference was in favor of the experimental group, as shown in the following table.

Table (6): Adjusted arithmetic means in the test of Basic Learning Processes.

group	number	Arithmetic means	Standard error
experimental	25	16.255	0.537
control	24	11.224	0.558

To find the effect of the teaching strategy on the acquisition of basic learning processes, the size of the effect was calculated using the ETA square, where it was found to be equal to (0.262); this means that the teaching strategy explains about (26.2%) of the variance as shown in Table (5).

Therefore, the current research found that the props strategy outperformed the traditional method of developing scientific concepts and acquiring science processes in the kindergarten child.

Discussion

– Regarding the first research hypothesis, the results showed a difference in the development of scientific concepts in favor of the experimental group, and this result can be explained by the following:

– The educational scaffoldings strategy is an application of the social constructivist theory, which believes that knowledge is built in the child's cognitive structure through his interaction with the teacher and his peers in a social context, where through its application children are provided with clear guidance that enables them to discover new knowledge themselves, link it to their previous experiences, and thus develop scientific concepts to achieve the desired goals (Churcher *et al*., 2014; Wright, 2018).

– The educational scaffoldings are also based on children's previous experiences to start from, work on reorganizing them, provide assistance to children to help them overcome the difficulties they may face, and develop their ability to organize information in memory and retrieve it easily (Al-Shehri, 2015).

– The educational scaffoldings are effective learning methods, because they help to organize practical activities so that they are supported by clear guidance and directives by the teacher as these activities support children to develop a concrete understanding of scientific concepts, and with children's progress in understanding concepts, support gradually decreases, which enhances the independence of the child in Learning and applying scientific concepts on its own, and this helps in building self -confidence in children and creating opportunities for prediction With scientific phenomena and their interpretation, which increases their motivation for learning, which works to develop their concepts (Al -Khatiba & Al -Fuqhai, 2022).

– It can also be said that the previous results indicate the extent to which children benefit from the strategy of educational scaffoldings in developing their abilities to interact during the implementation of activities, research and thinking, and increase their motivation to learn, and not focus on automatic memorization of information to reach higher levels of thinking and processing information in a more in-depth manner than the process of memorization, and remembering, which is limited to processing information superficially.

Such results agree with the results of previous research (Labib & Basma, 2022; Sayed, 2020; Sayed, 2024; Wakhidah, 2017).

Regarding the second research hypothesis, which showed that there is a difference in acquiring the basic learning processes in favor of the experimental group, this result can be explained and returned to the fact that teaching using educational allegations is a process in which children were helped to practice the basic science processes to cross the gap between what is known and what he is trying to know; Where the educational pillars are presented through the teacher before or during the children's completion of the educational mission to become more involved and integrated in their completion of the required task, and this requires the practice of scientific processes to reach the required knowledge, which leads to their mastery of them and thus acquire them (Nwosu & azih, 2011).

When using the educational scaffoldings strategy, children are given opportunities to think, meditate, interact fruitfully with the group, and negotiate to achieve a common goal, which includes refining their skills with experience by representing the role of the expert and the owner of the experience, which provides them with the ability to practice science processes to develop scientific concepts, and these results agree with the results of previous research (Barqawi & Abdul-Haq, 2020; Beljoun, 2015).

Research recommendations

Based on the previous results, the researcher made a set of recommendations, namely:

1. Conducting similar research on other study subjects and addressing other variables.
2. Training teachers in early childhood on how to apply the pillar strategy in kindergarten and other stages.
3. Providing curriculum developers with information about the strategy and its importance in curriculum design and planning.

Disclosure Statement

- **Ethical approval and consent to participate:** Approval to conduct this study was granted by the relevant educational authorities in Madaba Governorate, Jordan, and written informed consent was obtained from the parents or legal guardians of all participating children before the study was implemented.
- **Availability of data and materials:** The data underlying the findings of this study were prepared and provided by the author.
- **Author contribution:** The author selected the study title, wrote the theoretical framework and reviewed previous studies, and carried out all aspects of the study, including its design, implementation, data collection, and complete manuscript preparation
- **Conflict of interest:** The author declares that there is no conflict of interest.
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