European Journal of Research Development and Sustainability (EJRDS)
Available Online at: https://www.scholarzest.com
Vol. 4 No 12, December 2023
ISSN: 2660-5570

THE IMPACT OF CONTRACTUAL LEARNING STRATEGY ON DEVELOPING SELF-REGULATED LEARNING SKILLS AND SYSTEMIC THINKING AMONG STUDENTS OF THE COLLEGE OF EDUCATION

Ethar Abdul Mohsin Qasim Al-Mayyahi
Faculty of Education, University of Kufa
Email: ethara.almayyahi@uokufa.edu.iq

Article history:

Received: 17th October 2023
Accepted: 14th November 2023
Published: 20th December 2023

Abstract:

The current era is witnessing a great diversity in the field of technological innovations and modern strategies, which necessitated employing them in the educational process, as indication of progress of nations. The study aimed to evaluate the effectiveness of using contractual learning strategy in developing self-regulated learning skills and systemic thinking among students of the College of Education. The contractual learning strategy was compared with self-learning (SL) group (control) according to methodology implemented variable of self-regulated learning skills and systemic thinking. Sample population was taken from University of Kufa third undergrads students in College of Education studying in the Department of the Holy Quran and Islamic Education for the 2022-2023 academic year. The study used a population sample of 120 male and female students distributed over several divisions. Where the experimental group was division A while division B was to stand for the control group, as 30 male and female students were selected for each group. A two-group design was used to compare the SRL scale and the systemic thinking test. Research truth and reliability were determined at the beginning of the experiment. Equivalencies were applied for chronological age, intelligence, and past information test for the two groups. Before the teaching process, a pretest was applied as well as a post-test was performed upon completion. Measures of self-regulated learning and the systemic thinking test were applied, then the results were statistically analyzed using (SPSS) program. Findings of this study concluded that the average scores obtained by the students in the self-regulated learning skills scale were good, with significant difference appeared in the scale of experimental group. This indicates that the learning strategy by contracting had a positive impact on the dependent research variables. In light of this, taking advantage of active learning strategies, including this strategy under study is recommended to be taught in university institutions to complete the subjects of the prescribed curricula. Re-visualize the subject's curricula, making them realistic problems that emphasize the positive side of the student in the teaching process and responding to the data of modern scientific knowledge and technological development. The study also suggested conducting a similar study on other variables such as holistic thinking, retention, and the development of classroom teaching skills It also recommends the trend towards the subject or a comparative study between the two strategies.

Keywords: contractual learning strategy, self-regulated learning skills, systemic thinking

INTRODUCTION

The world is witnessing technological developments and new events in most countries worldwide. This had a significant impact on the scientific aspects that put universities in front of great challenges that lie in how to manage learning systems, so it became necessary to strive to improve the educational process by providing the opportunity

for teachers and learners to integrate and interact in scientific and academic programs according to their mental abilities in an attractive educational environment. And we know that everyone who learns faces problems or obstacles or stops learning in his course. On this basis, the role of the teacher must be radically changed, and the concept of self-regulated learning applied to the learner, and he is the focus of the learning process to be more active, interactive, and responsible for his learning.

In case of our educational reality, it is crucial to focus on mental aspect and skills of systemic thinking to face the future with an integrated view. (Al-Saeed, 2004: 1). Importance of modern experience in a scientific objectivity and determine the positives and negatives of SL are of significance. Therefore, the research aimed to frame the effect of using the learning strategy (LS) by contract and the development of SRL skills and student systemic thinking at the College of Education. Accordingly, the question is how the learning by contract affecting development SRL skills and systemic thinking among students at the College of Education?

Research importance: There is a need to develop traditional methods and methods in the process of teaching and learning, that not to be limited to the teacher in the delivery of information, but interest in training students to acquire the skills of using different learning resources (Fakhry, 2008). Among these strategies that may achieve these goals is the "learning strategy by contract", which makes the student deepen his knowledge, increases his initiative in the learning process, and becomes more independent. It also encourages him to actively participate in planning and choosing the means of learning. It is commensurate with his cognitive style and needs and may also contribute to promoting some of his positive values and attitudes. (aintisar and Amal, 2013: 1432)

The fact that systemic thinking is one of the higher levels of thinking, as through it the student becomes capable of the processes of criticism and investigation, and this confirms that this thinking is inclusive of the rest of the other types of thinking, and as a result, the student who thinks in this style acquires various and multiple levels of thinking (Afana Wenchwan, 2004, p. 219). It is important to encouraging the learner to study the relationship between him and his environment, and contributes to re-analyzing and constructing educational situations, and sees topics with a future vision, and thus the learner is connected to creativity by developing new solutions to problems posed (Al-Menoufi, 2002, p. 48). Its importance is also evident in his dealings with topics or problems in a harmonious and integrated manner between the elements, and this overcomes the cognitive dissonance between information when the phenomenon, topic or problem is addressed in an isolated form from the system in which it is located (Bartlett, 2001, p. 14).

Contracted Learning Strategy CLS is defined as "strategy through which a contract is drawn up and an accurate, specific and clear agreement is concluded between the teacher and the student or the teacher and a cooperative group of his students before starting the practice of the education process, explaining in it the educational resources that they will use and the nature of the multiplicity of scientific activities that they will practice and also agree on the method of evaluation and its timing." (Obeid, 2009, p. 14). While Skills learning Regulated-Self is defined to be: the style that the learner is practicing variety of learning situations on his/her own, followed by tendencies to acquire information, skills, and attitudes. This will be the main part for transferring of attention concentrating from the instructor to the learner (Maghraoui and Al-Rubaie, 2006). The other concept is Systematic thinking which defined by Obeid (2002) as "a type of thinking that includes managing the thinking process in thinking, and this requires higher skills to analyze the situation, and then its components are flexibly recombined with the multiplicity of organized recombination methods in the light of what is required to be reached". Therefore, this study aimed to evaluate the effectiveness of using CLS in for improving SRL skills and systemic thinking among undergrads students of the College of Education.

METHODOLOGY

The research hypotheses; where there is no difference ($P \leq 0.05$) based on the average scores obtained by students who studied according to the contracted learning strategy compared to those gained by the control students group in the same class who studying by regular ways in the self-regulated learning skills scale and/or according to the common methodology in the systemic thinking scale.

Where the limits of the research are: 1) Spatial boundaries: College of Education/University of Kufa. 2) Temporal limits: The research was applied during the 2022-2023 academic year. 3) While, Human determinant: third undergrad students in the Department of Qur'an Sciences, College of Education, University of Kufa. 4) Objective boundaries: the subjects prescribed for the subject of curricula and teaching methods for students of the third stage, Department of the Holy Quran and Islamic Education for the academic year (2022-2023).

Terminology:

1- Contracted Learning Strategy:

According to the definition of Obaid (2009), Contracted Learning Strategy is "a strategy through which a precise, specific, and clear agreement is concluded between the teacher and the student or the teacher and a cooperative group of his students before starting to practice the educational process. This clarifies the educational resources that will be used and the nature of the multiplicity of The scientific activities that will be applied, which also includes the method and timing of the evaluation." (Obaid, 2009: 14). Procedural definition: It represents a set of specific, planned procedures implemented by the researcher when teaching the subject of curricula and teaching methods to the research sample students in the experimental group in the classroom. It should be in an organized and sequential manner that leads to reaching the educational goals intended for the educational situation so that the student makes

the decision to take responsibility for his learning forms and patterns with the help of the teacher. This is based on negotiation to precisely determine the dimensions of the agreement in order to develop productive thinking and decision-making ability.

2- Self-regulated learning SRL skills:

Maghraoui and Al-Rubaie (2006) defined the Self-regulated learning to be a self-motivated method of learning by variety of educational situations followed by a tendency to acquire information, skills, and attitudes, thus leading to shift attention concentration from the teacher to the learner (Maghraoui and Al-Rubaie, 2006: 23). Procedural definition: It is a type of learning carried out by the learner based on his abilities and skills, so that he is responsible for his learning using tools, techniques and educational means. This includes choosing the time, place and pace that suits him and in line with his own capabilities. Here, the goals he set for himself are achieved using computerized educational programs and their applications. A self-regulated learning scale with determined grades prepared by the researcher was also adopted to measure the extent of progress and achievement of goals based on the grade obtained by the learner.

3- Systemic thinking:

Based on the definition by Obaid (2002), systemic thinking is "a type of thinking that includes managing the process of thinking in thinking, this requires higher skills to analyze the situation and reconstruct its components flexibly with multiple methods of organized reconstitution in light of what is sought to be achieved" (Obaid, 2002: 5). The researcher defined it theoretically as a system of higher mental processes that are based on analyzing the situation into its components and thus rearranging, reassembling, and realizing the existing relationships to reach the desired results.

Theoretical background:

Learning by Contract (LBC)

Learning by Contract is one of the types of learning through which it is possible to express the university student's commitment and participation in the method of education, as the student takes responsibility for the forms and patterns of learning and then makes the final decision regarding them through his cooperation with his teacher in the form of negotiation, through which the student reaches a decision regarding his learning. (Yassin, Zainab) and (Abdel Salam) point out that the contract learning strategy has specific procedures and steps, which are:

-Pre-negotiation procedures to define and prepare the topic, vocabulary, and learning activities and determine educational objectives.

- Negotiation and contract drafting procedures, according to which the teacher explains the objectives and how they relate to the subject of learning. The subject teacher explains the various aspects of negotiation through methods of presenting the content and leaves the students the freedom to choose. The teacher also identifies proposed learning activities, such as reports, writing some abstracts, and holding discussions with other students.

-The teacher presents the proposed teaching methods and methods and assessment and evaluation methods to the students and leaves them free to choose the best of them.

-The teacher explains the appropriate educational technical means that students can use during the lesson. (Yassin and Zainab, 2012: 157; Abdel Salam, 2006: 16)

Obaid (2011) mentioned that there are three stages according to which the "contract learning strategy" proceeds: a) Integration stage: In this stage, learners realize the general picture of what they are studying and what they are required to learn and do. b) The exploration stage: in which the path through which they will move through the topics and sub-components is explored, and they learn about the targeted learning sources. c) The contemplation stage: for assuring of achieving the desired results, and knowledge of new challenges presented by what you have learned. The self-motivation for continuous learning grows to establish the principle of what comes next (Obaid, 2011: 20).

The concept of self-regulated learning:

The SRL according to Montalvo & Gonzalez Torres (2004) is the integration of skill with will, the self-regulated learner knows how to learn, is self-motivated, and knows his capabilities and limits. According to this knowledge, he/she adjusts and organizes the learning processes (Walid Al-Sayed, 2009: 117).

Steps of Systemic Thinking

The steps of systemic thinking, according to what Abu Jalala (2007) mentioned, include i) Studying the scientific subject through understanding, awareness, and analyzing the academic subject into its basic components. ii) Clarifying the links and relationships between the basic components of the topic. iii) Focus on the hierarchy in the formation of knowledge systems. v) Scrutinizing the knowledge system with other systems to achieve the process of cognitive integration of topics (Abu Jalala, 2007: 74).

Research Methodology:

The semi-experimental approach was used to identify the effect of the independent experiment variable under study on the dependent ones among the students. It was based on the experimental design with two groups, the control and experimental (with a post-test) (Table1)

Table1. Experiment objectives lines, implementations and details

Group	Experimental Group	Control Group
Students Number	30	30
Independent variable	Contract learning strategy	Normal Method
The first dependent variable	Achievement (post-test)	Achievement (post-test)

The second dependent variable	Self-regulated learning (pre/post-tests)	Self-regulated learning (pre and post-tests)
The third dependent variable Direction	Post application of the self-regulated learning scale	Post application of the systemic thinking scale

Research community and sample:

The research community included third-stage students in the Department of the Qur'an and Islamic Education in the College of Education, University of Kufa, for the morning study for the academic year (2022-2023). Where an exploratory questionnaire was used among students to indicate the extent of the difficulties they face and the level of thinking and learning skills they have. A random sample was selected from the research community consisting of (120) male and female students distributed into three divisions. The two groups are equal in number and equivalent in a number of variables including; student's age calculated in months, intelligence, and prior knowledge.

Control procedures: the of the two research groups were subjected to equivalent tests, each tests had some determined variables.

- Internal safety variables

1- The sample students age in months: The students' ages were calculated in months and the T-Test was performed for two means (independent samples). The t-value calculated between the two groups was found to be 1.575 at a degree of freedom 58 recording no statistical significant (P≤0.05). This is suggesting no differences between the two groups in the chronological age variable (Table 2).

Table2. The arithmetic mean, standard deviation, and t-value of the scores of the two research groups in the chronological age

Groups	First	Second
No	30	30
Mean	223.83	219.00
Standard Deviation	15.692	10.989
Calculated T. value	1.575	
Tableted T. value	2	
Freedom degree	58	
P. value	Not Significant	

2-Intelligence: To measure this variable, the Otis-Lennon test was adopted to evaluate general mental ability, which was used at the advanced level according to Arthur Otis and Roger Lennon (1990), which was translated into Arabic by (Al-Qurashi (1990) (Jaber, 2003: 65). The test was applied. On the research sample for the two groups, the experimental, the control, and the control, the arithmetic means and the standard deviation were calculated, which compared the students' grades for the two study groups using the t-test as independent samples (Table 3). The results showed that the average grade of the experimental study group was (61.20) with A standard deviation value of (6.63), compared to (59.28) the average rate of the control group, which resulted in a standard deviation of (7.9) (Table 4).

As for the t-test, which was applied to the two study samples independently, it was found that the calculated (t) value was (1.375), which is less than the tabulated (t) value (2) for the study sample with degrees of freedom of df 58. Which indicates that there are no differences (P≤0.05) in this variable (intelligence) between the two groups of students under investigation.

Table3. Comparing the level of intelligence between the two research groups, the experimental and the control, based on the mean values, the standard deviation, and the calculated and tabulated T values (*P*≤0.05)

Groups	First	Second
No	30	30
Mean	61.20	59.28
Standard Deviation	6.63	7.90
Calculated T. value	1.375	
Tableted T. value	2	
Degree of Freedom	58	
P. value	No Significance	

3-Previous knowledge test scores: This was for identifying what the students of the research two groups (experimental and control) possess of previous knowledge and information related to the educational material under experiment. A test of the multiple-choice type, and each paragraph had four alternatives were prepared. The paragraphed were graded by a scale of 0 to 20, as one point was given to each correct point. Thus, the degree ranged from 0- to 20. Testing the validity of the procedure was performed as introduced to a group of experts in the field of specialization, curricula and teaching methods. The test was applied to the students of the research groups, and the T-test was used for comparison between the two independent research samples. Findings as shown in table (5) did not show

significant differences ($P \geq 0.05$), as the calculated t-value was 1.045 showing a value smaller than 2 that of tabular t-value for 58 df. This is confirming showing no differences between the research groups in terms of previous knowledge (Table4).

Table4. Evaluating the previous knowledge variable between the two research groups, the experimental and the control, based on the mean values, the standard deviation, and the calculated and tabulated T values ($P \leq 0.05$)

Groups	First	Second
No	30	30
Mean	70.1	67.2
Standard Deviation	5.569	7.364
Calculated T. value	1.045	
Tableted T. value	2	
Freedom degree	58	
P. value	Not Significant	

External safety (adjusted extraneous variables):

Some variables were adjusted to ensure experimental safety including: A) selection of the sample and its equivalences, B) measurement, C) Research Confidentiality, D) Study materials, E) Teacher (is the researcher and the teacher of student sample under study): Students under study were taught by the same teacher herself.

The SRL scale was used with 5 grades, where grade 5 means a student strongly agrees with the level of SRL, 4 for student agrees with SRL level, 3 where student is unsure about it,, 2 for student who does not agree with his/her SRL level, and 1 for student strongly disagrees. Levels were divided into three categories, low, medium and high level of self-regulated learning.

The scale under study was presented to a number of experts in curriculum and teaching, educational psychology, and measurement and evaluation to evaluate the apparent validity of the scale under study. The experts' observations were taken into consideration, and the stability of the scale was confirmed by test and retest. A sample of (20) male and female students who underwent application of the scale was taken, with a time difference of two weeks. The Pearson correlation coefficient was calculated to be adequate at a reliability of 0.88.

Systematic thinking test:

Systemic thinking was also measured according to an objective test prepared by the researcher, MCQ, consisting of (20) items with four answers for each item. Completing the missing phrases in the second question was also used for the same number of paragraphs (20). In addition to a third question that included completing different types of diagrams for (10) paragraphs. The paragraphs and answers were distributed homogeneously and balanced. The psychometric properties of the validity and reliability items were also evaluated according to the following procedures:

1- Honesty: It was tested for its validity, as the test was prepared and introduced to a number of expert and specialized teachers in Iraqi and Arab universities to express their observations about it. Some questions were modified in the light of these observations. The percentage of agreement on the paragraphs was (80%) of their opinions. The research sample was subjected for statistical analysis and extracting coefficients of discrimination and difficulty and the effectiveness of wrong alternatives.

2- Paragraphs discriminatory power: the researcher arranged the students' responses (the statistical analysis sample) descending scores from highest to lowest, and then chose 27% of the upper and lower scores to represent the upper and lower extreme groups, whose scores will be adopted in how to calculate the power of discrimination of the paragraphs. The T-test was used for two samples independently to extract the discriminatory power of the paragraphs, it was found that all the paragraphs had a discriminatory ability between the two groups ($P \leq 0.05$).

3- Reliability: To find out the stability of the test, the re-application method was used on the same reconnaissance sample 14 days after the test first application. This was according to the reliability coefficient, the two applications using the Pearson correlation coefficient the value was 0.8121, and according to the reliability of the test using the Cronbach-alpha equation, it valued 0.8649. Accordingly, the test is considered reliable and ready for application to the research sample in its final form.

The self-regulated learning test and systemic thinking test were applied on the two students experimental groups, Contract learning strategy and the traditional regular method. Post application tests were also performed.

Data analysis

Data of the experiment were subjected to be analyzed using SPSS (Statistical Package for Social Sciences) software Chicago, Illinois, USA, version 16.0 (Fiddler et al., 2013). The self-regulated learning skills scale, and the systemic thinking scale were calculated as percentage. Chi-square, arithmetic mean, hypothesis, standard deviation, two independent samples T-test were used.

RESULTS AND DISCUSSION

First: results display

To confirm the first null hypothesis, self-regulated learning hypothesis imply must not be differed ($P \leq 0.05$) for mean scores between the students in the two experimental groups contractual learning strategy (Table5 and Figure1) and

the organized self-learning (Table 6 and figure2). However, by comparing the results of the post-test using two independent samples T-test for, significant differences ($P \leq 0.05$) were found in favor of the experimental group, as the calculated T-value reached which is greater than the value. The T tabulated value was 2 with a degree of freedom (58), which indicates the superiority of experimental group students over the control students group (Table7 and 8).

Table 5. Results of scale measurement of the experimental students group (contractual learning strategy) for the pre/post-tests.

Experimental groups	No. of Sample	Mean	Standard Deviation	Degree of freedom	Probability on 0.05	
					Calculated	tabulated
Pre-test	30	47.892	5.632	58	14.048	2,00
Post test	30	78.954	3.632			

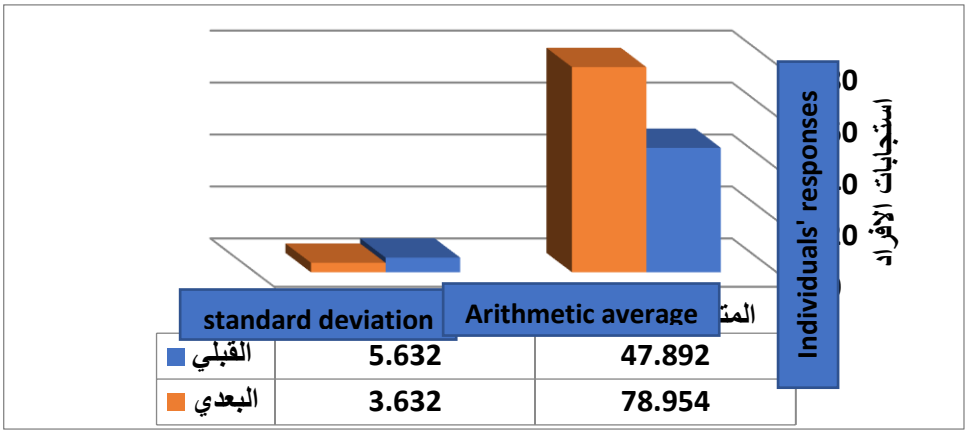

Figure 1 . Results of the experimental group (contractual learning strategy) for the scale of pre/post tests

---

Table 6. Results of the control group (organized self-learning) for the scale (pre and post-test)

Control groups	No. of Sample	Mean	Standard Deviation	Degree of freedom	Probability on 0.05	
					Calculated	tabulated
Pre-test	30	46.752	6.492	58	7.468	2.00
Post test	30	57.787	4.881			

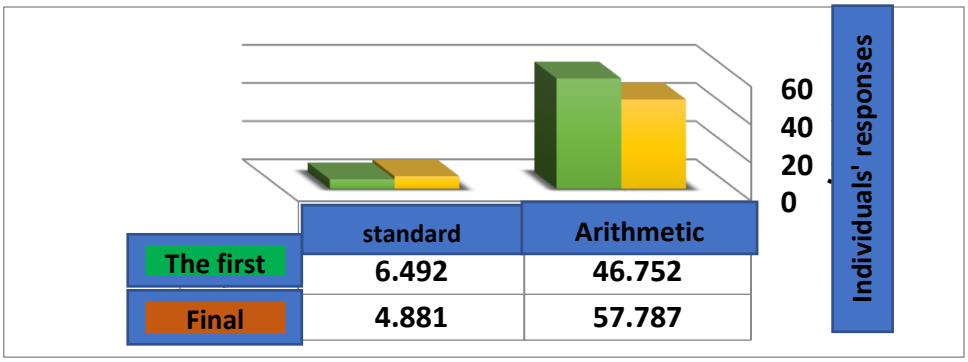

Figure 2 . Results of the control group (organized-self learning) for the scale of pre/post tests

---

Table 7 . Results of the post-test compared between the experimental group (contractual learning strategy) and the control group (organized self-learning)

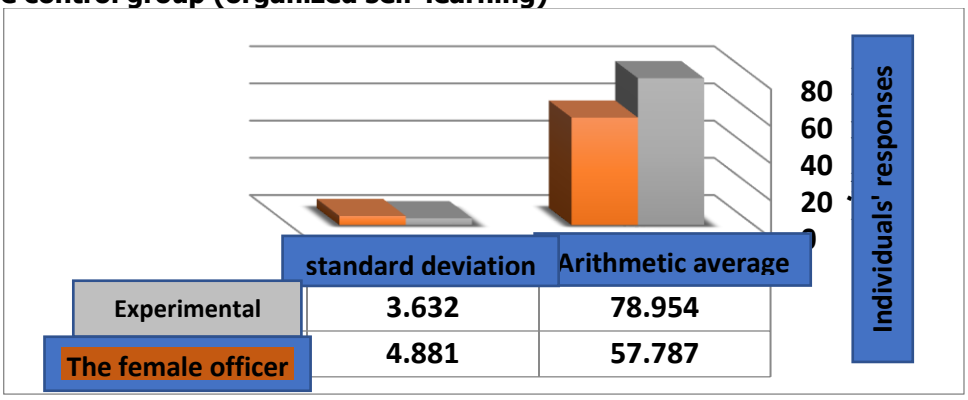

Figure 3 . Results of the post-test compared between the experimental (contractual learning strategy) group and the control (organized self-learning) group

---

Table 8 . The learning education levels of experimental group (contractual learning strategy) and the control group (organized self-learning)

Groups	No. of Sample	levels of self-regulated education		
		Low (1-2.33)	Medium (2.34-3.67)	High (3.68-5)
Experimental	30	-	-	3.85
Control	30	2.25	-	-

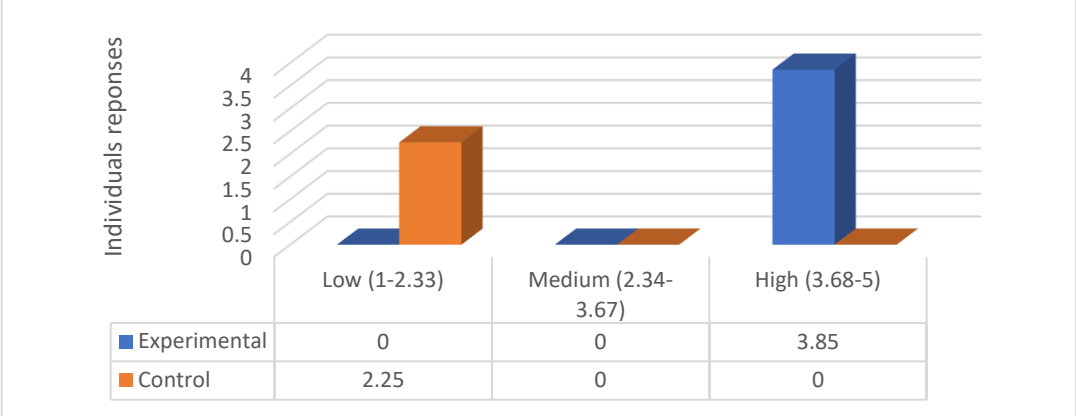

Figure 4 . Levels of self-regulated education compared between the experimental (contractual learning strategy) group and the control (organized self-learning) group

---

Accordingly, based on the findings, the study is rejecting the null hypothesis while accepting the alternative hypothesis. The results show that the experimental group was better in the measures under study, with significant increases than the students in the control group. Therefore, there appears to be a clear positive effect on the measure of self-regulated learning resulting from using the contractual learning strategy.

The second hypothesis related to systems thinking

In this case, it was found that the average grades of the experimental group students who studied the subject according to the contractual learning strategy did not differ significantly ($P \leq 0.05$) from the average grades according to the usual method of systematic thinking resulting from the control group students.

Comparing the results of the post-test for the two groups and using the T-test for two independent samples for meaningful significance showed that there were statistically significant differences ($P \leq 0.05$) between the under study two groups, where the experimental group was superior to the control one. The T-value calculated reached 14.854 to be significantly higher than the value of 2 for Tabulated T at 58 degree of freedom (Table 9). Therefore, the study decision is rejecting the null hypothesis and accepting the alternative hypothesis.

Table 9 . Statistical significance of the scores of the students of the two research groups in the dimensional systemic thinking test

Groups	No. of Sample	Mean	Standard Deviation	Degree of freedom	T. value		Probability on 0.05
					Cal.	Tab.	
Experimental	30	26.80	2.657	58	14.854	2	Significant
Control	30	17.17	3.153				

DISCUSSION

The current research found that the two learning methods under study were different in favor of the experimental group that uses e-learning platforms in the achievement test over the self-regulated learning. The results indicate that the skills of the experimental group members towards contract learning strategy are good and positive. From this, it is clear that this strategy of learning has had a positive impact and that it has contributed to the students' understanding and acceptance of the scientific material. The students' interaction has also appeared greatly as it provides a safe, rich and non-routine educational environment. This method allows students to enjoy the educational content and the activities and performance tasks it includes, and also helps them acquire knowledge in an atmosphere of excitement, suspense, and attention. From the findings and this study case, it can be implied that the use of this strategy was beneficial to the students in the research sample, as it is a comprehensive method that follows the logical sequence in

presenting the academic material and uses some activities that are appropriate to the students' level of cognitive awareness. On the other hand, this method takes into account the different mental levels of students and contributes to developing their skills, as it is one of the methods used in active learning strategies to develop motivation, prepare for new learning, and improve perception. It also helps in activating what is stored in students' memories and gives them a wide space for communication to achieve better learning because it stimulates thinking and making mental effort to arrive at results, facts, and ideas. In general, this strategy transfers learning to be compatible with the twenty-first century, which depends on digital devices, learning, and self-direction, which makes the organized learning they do meaningful, balanced, and organized.

CONCLUSION

It is clear from the results in general that the contract learning strategy was superior to the traditional classical method of learning. This is due to the specifications of contract learning characterized by therapeutic methods with comprehensiveness, in addition to the ability of this strategy to follow the logical sequence in presenting the academic material. It also adopts formative tests, various interactive activities, colorful games, and graphs that suit the subject and the level of cognitive awareness among students. All of these characteristics together help increase dynamic interaction and diagnose students' weaknesses. Therefore, it seems that this learning strategy contributed to raising the performance of the students in the experimental group in systemic thinking when compared with the performance of the students in the control group.

The study recommends using the contract learning strategy in the teaching process in university institutions and urging teachers in educational and university institutions to diversify the use of modern teaching strategies and educational techniques that emphasize the positive role of the student in the learning process and developing thinking. Creating a guide on curricula and teaching methods with a guide that shows the importance and benefit of the strategy of mastering education, its remedial methods, and how to apply it practically. For the purpose of achieving the desired goals. An attempt to reconsider the vocabulary of curricula in university institutions for the purpose of making them address real problems in society while ensuring response to the data of scientific development.

REFERENCES

1. Abu Jalala, S. (2007). Science Curricula and the Development of Creative Thinking, 1st Edition, Al Shorouk, Amman, Jordan.
2. Afana, E. and Nashon I. (2004). The effect of using some metacognitive strategies in teaching mathematics on the development of systemic thinking among the eighth summer students in Gaza, the Egyptian Society for Practical Education, research presented to the eighth scientific conference, volume one, Ismailia July 25-28.
3. Al-Affoun, N. H. and Abdul-Sahib, M. M. (2012): thinking, its patterns, theories, and methods of teaching and learning, 1st edition, Dar Safa for publishing, Amman.
4. Al-Hussainan, I. A. (2010). Strategies for self-regulated learning in light of the Bentrich model and its relationship to achievement, specialization, academic level, and preferred method of learning, (PhD thesis), Imam Muhammad bin Saud Islamic University, Riyadh, Saudi Arabia.
5. Al-Kubaisi, A-W (2010). Systematic thinking (employment in learning and teaching, eliciting it from the Holy Quran), Amman: Dar Dibono.
6. Al-Maghrawi, A A-M and Al-Rubaie, S. (2006). Self-learning, its concept, its methods, its application, Kuwait, Al-Falah Bookshop for Publishing, Kuwait.
7. Al-Saeed, S. M. (2004). Systematic Thinking Skills, The Second Arab Conference on the Systematic Approach to Teaching and Education, Menoufia University, Cairo, 2004.
8. Al-Shuwaili, H. (2019). The impact of the Learning Cell strategy and Jisco (jigsaw) on achievement and systemic thinking among students of the College of Education in the Foundations of Education subject, Dhi Qar University Journal, Volume 14, Number 1.
9. Asha, I. K. and Ayyash, A. N. (2013). The effect of the contract's strategy on the collection of concepts in life sciences and the development of reflective thinking among ninth grade students in UNRWA schools in Jordan, *Educational Sciences Journal*, Ap. 4, Jordan.
10. Bahy, I., Latrash, F. and Qamari, H. (2010). The effectiveness of the Cort program in increasing the level of using self-regulated learning strategies among a sample of gifted students. (Unpublished letter to Sans), Algeria.
11. Bartlett, G. (2001). Systemic thinking a simple thinking technique for goining systemic focus, The international Conference on thinking , Breakthroughs , probsolve international .
12. Codde, J. (2006). Using Learning Contracts in the Collage classroom, DMI, Michigan State University: East Lansing, MI48824
13. Dart, B. and Clarke, J. (1991). Helping Students Become Better Learners: A Case Study In Teacher Education. Higher Education, 22 (14), pp. 317-335.
14. El-Menoufi, S. (2002). The effectiveness of the systemic approach in teaching trigonometry and its impact on systemic thinking among secondary school students, the Fourteenth Conference, "Educational Curricula in the Light of the Concept of Performance," Vol. 2, The Egyptian Association for Curricula and Teaching Methods, (24-25). July)

15. Fiddler, L., Hecht, L., Nelson, E. E., Nelson, E. N., & Ross, J. (2013). SPSS for Windows version 16.0: a basic tutorial.
16. Fakhry, A. (2008). The effect of e-learning on achievement, skill performance, and technological achievement in computer subjects among third-grade preparatory students, Faculty of Education, Menoufia University.
17. Jaber, A. H. J. (2003). Multiple Intelligences and Understanding, Development and Deepening, Dar Al-Fikr Al-Arabi, 1st Edition, Egypt, Cairo.
18. Karim Blasim Khalaf and Ahmed Abdul-Amir Rahim (2015). The effectiveness of teaching with the learning strategy by contracting in the creative thinking of the second intermediate grade students in biology, *Al-Qadisiyah Journal of Arts and Educational Sciences*, 1, Al-Qadisiyah University, Iraq.
19. Knowels, M. (1986). Using Learning Contract, San Francisco, CA Jossey Bass Inc. Publishers
20. Mohtashami, J. (2007). Comparing efficacy of implementing two teaching methods contract learning and traditional instructions on clinical skills of nursing students in psychiatric.
21. Nabi, M. et al. (2010). Learning strategy by contract, the roles of the university student, a draft strategic plan and application models, a paper presented to the International Conference on Higher Education 4-6-2010 Beirut Lebanon Cairo, Dar Al Masirah.
22. Obaid, William (2002). Knowledge and Beyond Knowledge, Concept and Significance, Fourth Scientific Conference on General Education Mathematics in the Collective Knowledge Complex for Mathematics Education. Zagazig University - Faculty of Education in Banha - Egyptian Society for Mathematics Education, Egypt
23. Obaid, W. (2003). Thinking and the School Curriculum, 1st Edition, Al-Falah Bookshop for Publishing and Distribution, Kuwait
24. Obaid, William (2009), Strategies for teaching and learning in the context of a culture of quality, conceptual frameworks. Dar Almaseerah Press, Amman, Jordan 217P
25. Paris, S. & Winograd, P. (2001). The Role of Self-Regulated Learning in Contextual Teaching: Principles and Practices for Teacher Preparation. Washington, DC: U.S. Department of Education, USA
26. Al-Sayed, W. Sh. Sh. (2009). Methods of procedural knowledge and cognitive beliefs and their relationship to self-regulated learning strategies, (unpublished doctoral thesis), Zagazig University, Egypt
27. Yassin, W. A-K and Raji, Z. H. (2012). Constructive Approach, Models and Strategies in Teaching Scientific Concepts, Noor Al-Hassan Library, Baghdad.
28. Zaitoun, Aish Mahmoud (1994): Methods of Teaching Science. 1st edition, Dar Al-Shorouk for distribution and publishing, Amman, Jordan
29. Zayer, S., Dakhil, S., Issa, A. and Faisal, M (2013). Strategies, methods, models, styles, and teaching programs. Part 1, Dar Al-Murtada, Baghdad, Iraq.
30. Intisar Khalil Asha and Amal Najati Ayyash (2013). The effect of the contracts strategy on the acquisition of concepts in the life sciences subject and the development of reflective thinking among ninth-grade female students in UNRWA schools in Jordan, Journal of Educational Sciences, Supplement 4, Jordan.
31. Walid Al-Sayed, Walid Shawqi Shafieh (2009): Procedural knowledge methods and cognitive beliefs and their relationship to self-regulated learning strategies, (unpublished doctoral dissertation), Zagazig University, Egypt.