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The degree of using meta-cognitive thinking strategies skills for problem solving by a sample of biology female teachers at the secondary stage in the State of Kuwait

Khadir Abdullah Al Azmy* and Tahani Muhammed Alebous

Department of Methods and Teaching, College of Education World Islamic Sciences and Education University, Amman, Jordan.

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The study aims to identify the degree of using meta-cognitive thinking strategy skill that relates to problem solving by teachers in the State of Kuwait and to investigate whether there is a statistical significance of using the skills of meta-cognitive strategies on solving problem related to their years of experience and their educational area. The current study followed the descriptive and analytical method that is the most appropriate for educational studies particularly that have to with correlation studies and the study of the relationships between variables. The research tool is represented in a list of thinking of meta-cognition that is distributed in (36) items that are basically under four dimensions including understanding the problem, setting a plan for solution, control and evaluation. The research sample that was analyzed contained (204) members. They are teachers who teach biology at secondary school in the state of Kuwait that is, 50% of the total number of female teachers in the State of Kuwait who are actually working in the whole six educational areas available in the state of Kuwait. The survey was electronically distributed via social media platforms because of Corona Virus pandemic witnessed by the State of Kuwait and the world. The research findings showed the degree of using the skills of meta-cognitive strategy that relate to problem solving by the research sample in the State of Kuwait was high despite of the different degrees of each strategy. The results indicated there is not a statistical significance of applying the skills of meta-cognitive strategies on solving problem by the research sample belong to their years of experience and the educational area they work in.

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Key words: Strategy, strategies of meta-cognitive thinking, understanding the problem, setting a plan for solution, control, evaluation.

INTRODUCTION

Metacognitive thinking skills are one of the main predictors of success not only inside the classroom but also beyond. Learners who are able to access their own cognitive processes and reflect on what and how they are learning are able to learn more effectively. For some learners, metacognitive thinking seems to come naturally,

*Corresponding author. E-mail: thankshussain43@gmail.com; Tahaniabous@yahoo.com.

but most need a little aid to get to what is hidden in their own thinking process. Just like any other skill, meta-cognitive skills can be fortunately taught and developed.

Metacognition as a concept consists of two terms. They are ‘meta’ and ‘cognition’. Together they are translated into ‘beyond thinking’. The term itself was first unveiled in 1976 by John Flavell, who is a well known American psychologist (Flavell, 1976). Flavell defined metacognition as being mindful of one’s own cognitive processes and having the ability to use that knowledge to purposefully regulate those cognitive processes (Al Kheken and Attom, 2014).

Metacognition is a uniquely human capacity. Humans are able to turn what they really observe inward to think about what they know, need to know, and what ways they can use to solve any problem. Metacognition is what makes learners to go back a little bit and think through troubles rather than reacting simply. Metacognitive thinking allows learners to learn from prior experiences, generalize ideas so they can apply strategies when dealing with new situations, evaluate the use of different strategies, and determine how they might do things in different way next time (SaadAllah, 2014). Thinking about thinking means an individual’s awareness, and understanding of what is learnt; the ability to observe the self and evaluate cognitive actions in relation to learning. It also refers to reviewing the emotional self to see if one’s goal has been achieved or not, and organizing work by selecting the appropriate strategy (Amin, 2009).

Metacognitive thinking is very significant because it is related to learners’ ability to overcome and adapt. As learners do their best to think about their own thinking process, they begin to understand themselves in much better ways. Those learners who use metacognitive thinking may also think about their process in achieving their goals. They are able to find what works best, and what can be better (Callender et al., 2016).

Moreover, the significance of metacognition strategies is represented in their basic role in the educational process, as they focus on the ability of the learner to plan, monitor, control, and evaluate his or her learning, as well as they work to develop learners' acquisition of different learning processes, and allow them to assume responsibility and control in the processes related to education. Metacognition strategies facilitate the active building of knowledge and help in the development of independent thinking as well (The Pakistani, 2015).

Cox (2005) indicated that metacognitive skills can be taught to learners to develop their learning. That is simple because learners who have got well-developed skills of metacognitive may think through a problem or approach a learning task. They may also choose suitable strategies and make decisions to resolve any problem then perform any task successfully. Also learners with developed cognitive thinking tend to think about their own thinking processes and take time to think about and learn from their mistakes inside or outside the classroom. The strategies of metacognitive thinking strategies refer to ways learners may use to understand; in other words, it means processes designed for them to ‘think’ about their ‘thinking. In such a way, teachers can positively affect learners with learning disabilities by helping them to improve a suitable plan for understanding information (Kleitman and Narciss, 2019). Metacognitive strategies are the awareness monitoring of learner’s cognitive strategies to achieve determined objectives; for example when one learner asks himself or herself questions about his/her homework and then observes how well he or she answers the questions (Kurt and Kurt, 2017).

METACOGNITION IN PROBLEM SOLVING

Two dimensions of metacognitive ability have been recognized. They are knowledge of cognition, and regulation of cognition (Flavell, 1978). Humans begin learning the moment they are born and never stop Cognition is how learners learn. Each learner depends on different rates of cognitive skills to comprehend and remember what he or she reads, sees or hears. That simple depends on the topic, the context and personal experiences (Chan, 2010).

Anandaraj and Ramesh (2014) indicated that there is a significant correlation between learners’ metacognition and problem solving ability. Metacognition is more effective in the environments of learning in which metacognitive thinking strategies are provided during problem solving process

Kapa (2001) clarified that understanding when and how learners use metacognitive strategies plays a vital role in their success during problem solving process.

However, metacognitive thinking may get learners to monitor their understanding and organize their learning and problem solving processes (Teong, 2003). For problem solving, there are two basic metacognitive skills. They are self-monitoring and planning (Derry and Hawkes, 1993). Self-monitoring refers to the ability of learners to self-check during problem solving process. Planning is simply the ability of learners to divide a problem into small parts that can be solved in any appropriate way (Harandi et al., 2013).

Kapa (2001) proposed a metacognitive approach to teaching of problem solving. The approach included specifically five steps. They are identification of the problem, representation of the problem, planning, performance of planning and assessment. Havenga et al. (2013) also gave a guideline for the same metacognitive approach to problem solving consisting of five levels that are 1) identifying the problem by highlighting the basic points and writing down the most major essentials, revision and planning the problem, 2) suggesting the solution, 3) planning the following step by input, process and output, 4) reflecting on motivation for decision making and 5) applying the suggestion and

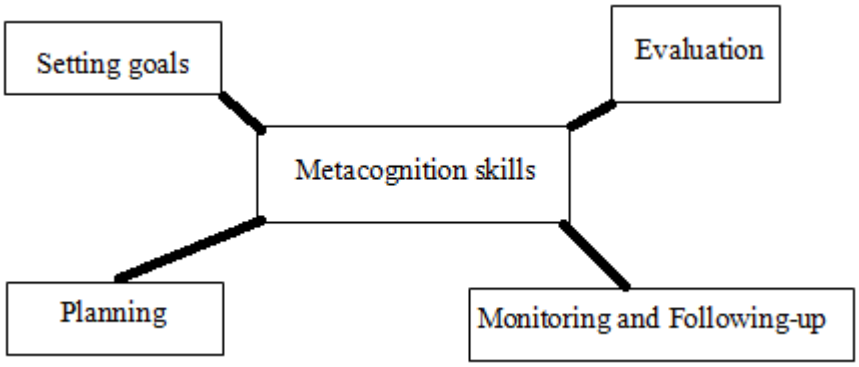

Figure 1. Metacognition skills.

writing down the outcome later on to develop it.

However, Garner (1987) clarified that good learners appear to have more knowledge about different aspects of memory such as capacity limitations, rehearsal, and distributed learning. Hartman (2002) observed that even when learners do not know what to do, they may fail to solve familiar problems. But what is interesting is that learners may find a solution immediately without even discussing why that solution is appropriate and others not.

METACOGNITION STRATEGIES

Metacognitive strategies are just the decisions that any learner makes before, during and after the process of learning. There are several metacognitive strategies that aim at developing learners' metacognition as follows (Figure 1).

Planning

At the beginning of any learning activity, the teacher has to make learners familiar with steps and rules in problem solving. The teacher also has to clarify time restrictions and goals that have to do with the learning activity so that they can be clear to all learners. Consequently, learners will keep all these things in mind during the learning activity. Learners can then assess their performance against them (Mbato, 2013).

Monitoring and following-up

During the learning process, teachers have to keep the target in focus. Monitoring and controlling refers to maintaining a sequence of operations or steps, knowing when a sub-goal will be achieved, knowing when to move to the next process, selecting the relevant process to follow in the context, discovering obstacles and errors and knowing how to overcome obstacles and getting rid of mistakes (Medina et al., 2017).

Evaluation

Evaluation means the ability to analyze performance and effective strategies following the occurrence of learning or solving problems. It refers to the individual's evaluation of learning processes and includes the evaluation of progress in learning activities. The assessment skill can help pupils to develop a set of necessary skills and strategies that can help them in the learning process and improve it (Özsoy et al., 2017).

Teachers can enhance metacognitive thinking if they guide their learners to evaluate the learning activity. This is simple can be done through two sets of criteria by which learners could be asked to evaluate the learning activity. For example, they can be asked whether they like or dislike the learning activity or what may help them more during the process of learning. Teachers in such a case get learners to keep the criteria in mind when classifying their views and opinions about the learning activity to motivate the reasons for those opinions (Ornstein and Hunkins, 1998).

Goals setting

Goals can be defined as expectations about the intellectual, social and emotional outcomes for learners as a consequence of their classroom experiences. These goals enhance learners' ability to be self- regulated in various circumstances (Cross and Paris, 1988).

Goals are often classified in two methods. They are mastery goals and performance goals. Mastery goals refer to process, learning, and development of competence. Performance goals have to do with social comparisons, orientations or demonstrating competence to one's peer group (O'Neill, 1992).

Goal setting as an aspect of metacognitive thinking

strategies comes with a theoretical basis. It is necessary to consider how such a theoretical basis can be translated in the classroom. When understanding what goals fit in practice, they might be helpful to think of goals on more than one time. That is, not all goals will have the same scope; meaning that some goals will be comprehensive and highlight all needs, and some will be more specific on individual parts of the task used to achieve the overall assignment (Shannon, 2008). As a very basic component and a source of meaningful teaching, the role of metacognitive thinking occupied a very good extent. However, the controversial issue is deciding how, when and why metacognition should be integrated in the curriculum so that it can be an essential strategy of teaching (Papaleontiou-Louca, 2003).

Haiduc (2011) indicated that teaching metacognition is crucial in the process of learning. So learners are to be aware that they use metacognitive thinking but they need to organize their skills in order to be able to achieve all the above mentioned strategies of metacognitive thinking. Then learners will turn into self-directed ones. Once learners become experienced with strategies of metacognitive skills and self-directed ones, they do not need guidance. Then they will be able to control and manage and put their all thoughts in the right direction (Shannon, 2008).

Despite all developments in the curriculums at the secondary stage in the state of Kuwait during the last years, it is still very necessary to rely on new strategies just like metacognitive thinking strategies that can go along with the development of learning and move the process of learning from teacher to learner. That is why the two researchers conducted the current study that aimed at identifying the degree of using metacognitive thinking strategies in solving problem by teachers at the secondary stage in the state of Kuwait. Meanwhile, San`ani and Radwan (2020) found that there are high levels related to metacognition strategies, meaning that, as indicated by Iwai's research (2019), they are very keen to choose and use metacognitive thinking strategies that are appropriate for their needs, and their development.

METHODOLOGY

The methodology adopted is the qualitative method. A survey with quantitative treatment in which the data processed through the SPSS were applied. The current research aims to identify the degree of using strategic metacognitive skills to solve problems by teachers in the State of Kuwait (understanding the problem - Planning - monitoring – evaluation).

The research sample was selected randomly. The research sample consisted of teachers who teach biology in grades 11th and 12th. The survey sample consisted of 204 teachers from schools who are actually related to over six educational zones in Kuwait, which are (Al Asema Educational Area – Al Farwaniya – Al Jahra - Mubarak Al-Kabeer – Al Ahmadi and Hawalli), in addition to a number of private schools. As for the study sample that was subjected to analysis, it amounted to 204 teachers, that is, about 50% of the total number of teachers in the State of Kuwait, according to the latest statistics of the Ministry of Education. The Preparation of survey is closely related to the variables of the study, as the study aims to recognize the most important strategic metacognitive skills that solve the problem of teachers in the State of Kuwait. So the survey that was built and used in the current study is as follows:

(i) The metacognition list: The metacognition list was used by teachers prepared and developed by the researchers after reviewing the previous educational literature related to the metacognitive thinking field, as it contains all metacognitive components, and has high validity and reliability.
(ii) Description of the meta-knowledge list: it contains (36) paragraphs distributed over (4) dimensions as follows (Table 1).

The validity and reliability of survey

For a questionnaire to be regarded as acceptable, it must possess two very basic characteristics which are reliability and validity (Litwin and Arlene, 1995).

Reliability

To reduce the memory effects and make sure the respondents answer the survey questions different from the way they answer in the first time, the researchers gave the survey to the same group of respondents at a later point in time and repeated the research. Then, they compared the responses two times. The results showed the responses are different in both times

Validity

First, the researchers have two people who understood the topic and went through the survey. They checked if the survey captured the topic under investigation effectively. Secondly, the researchers got two experts from Kuwait University- Department of Education on survey construction to check it out for double and confusing items.

The survey

Eventually, the researchers prepared the final research survey used after ensuring its reliability and validity. The research survey was applied to the final sample consisting of (204) teachers in the State of Kuwait. The data were coded and transferred to the SPSS Statistics Program, and appropriate statistical methods were made of frequencies, percentages, means and standard deviations in order to answer the research paper questions and verify the validity of the hypotheses.

The research hypotheses

(i) The degree of using the skills of meta-cognitive strategies that relate to problem solving by the research sample is high.
(ii) There is a statistical significance of applying the skills of meta-cognitive strategies on solving problem by the teachers – the research sample- based on their years of experience and their educational area

RESULTS AND DISCUSSION

Data were collated, analyzed, triangulated, and documented in a narrative form using three thematic

Table 1. A list of metacognition skills.

S/N	The skill	Clause No.
1	Understanding the problem	5-13
2	Developing a plan for the solution	14-24
3	Monitoring	31-25
4	Evaluation	32-40
Total	**36 Items**	

Table 2. Means and standard deviations of teachers using of metacognition skills that are related to solving problem in the secondary schools of the State of Kuwait.

S/N	Rank	Field	Mean	St	The degree
1	4	Evaluation	4.33	0.531	High
2	3	Monitoring	4.32	0.576	High
3	2	Understanding the problem	4.27	0.536	High
4	1	Setting a solution	4.01	0.624	High
Total			4.22	0.501	High

headings:

Using the skills of metacognition stategies by teachers

To test the first hypothesis, means and standard deviations of the degree of use of biology parameters at the secondary stage in the State of Kuwait were extracted from strategic metacognitive skills related to problem solving. Table 2 illustrates this. Table 2 shows that means ranged between 4.01-4.33, where the evaluation came first with the highest mean of 4.33 and a high degree of appreciation; while the development of a solution plan came last with a mean of 4.01 and a degree of appreciation. The average of the tool as a whole was 4.22 with a high degree of appreciation. The means and standard deviations of the estimates of the study sample individuals were calculated on the paragraphs of each field separately as follows**.**

Understanding the problem

Table 3 shows that the means ranged between 3.97 and 4.67, where item No. (7) which states “I encourage students to ask scientific questions and inquiries with what they think is difficult for them in their own language” came first, with mean of 4.67 and a high degree of appreciation; while items No. 9 and 11, “The female students draw illustrations of the parts of a living creature, for example in their own style, “I instruct the students to analyze and comprehend the dimensions of the scientific problem ” were last, with a mean of 3.97 and a high degree of appreciation. The mean for understanding the problem as a whole was 4.27, with a high degree of appreciation.

Setting a solution

Table 4 reveals that the means ranged between 3.46-4.55, where item 14 came first: "I accept the ideas and opinions of the scientific student and do not underestimate their importance even if they are outside the course", with mean of 4.55 and a high degree of appreciation; while item No. (16) “I ask students, for example, to draw a picture of nerves while they are in a case of heart disease and compare it with a picture of nerves while it is in a normal state” came last, with an average of 3.46. The total mean for developing a plan for the solution as a whole was 4.01, with a high rating.

Monitoring

It is evident from Table 5 that the means ranged between 4.07-4.56, where item No. (30) which states “I ensure the classroom environment is suitable for effective learning and problem solving” came first with mean of 4.56 and a high degree of appreciation; while item No. (26), “I make sure that the students rely on themselves in solving scientific problems,” came last, with mean of 4.07 and a high degree. The mean of the control as a whole was 4.32, with a high degree of appreciation.

Evaluation

Table 6 shows that the means ranged between (3.98-4.63), where item No. (32) came first “I follow the

Table 3. Means and standard deviations of the first field.

S/N	Rank	Item	Mean	Standard deviation	The degree
1	7	I encourage students to ask scientific questions in their own language.	4.67	0.593	High
2	6	I guide students by reading scientific terms and concepts in a clear and audible voice.	4.51	0.616	High
3	5	I encourage students to reflect on scientific terms and concepts before illustrating them.	4.43	0.762	High
4	8	I encourage students to show their interest in terms and practical concepts.	4.41	0.699	High
5	10	I direct the students to use the available data to define the problem.	4.20	0.825	High
6	12	I guide students in practicing the skill of mental visualization to understand the dimensions of the scientific problem.	4.19	0.881	High
7	13	I direct the students to reformulating the scientific problem in their own language to ensure correct understanding of the scientific problem.	4.12	0.874	High
8	9	I direct the students to draw illustrations of the parts of a living creature, for example, in their own style.	3.97	0.957	High
9	11	I order the students to analyze and understand the dimensions of the scientific problem.	3.97	0.887	High
Total			4.27	0.536	High

Table 4. Means and standard deviations of the second field.

S/N	Rank	Item	Mean	Standard deviation	The degree
1	14	I accept the ideas and opinions of the scientific student and do not underestimate their importance, even if they are outside the course.	4.55	0.783	High
2	18	I encourage students to draw mental maps and correct alternative perceptions of some scientific concepts and terms.	4.36	0.772	High
3	19	I train students in the steps of mental mapping and the development of educational achievement.	4.36	0.804	High
4	22	I direct the students to determine the steps required to achieve each goal.	4.11	0.932	High
5	15	I ask the students to collect all the information that may be useful in solving or understanding the established scientific questions.	4.02	0.882	High
6	20	I ask students to show similar problem-solving methods that they previously used.	4.00	0.851	High
7	23	I direct the students towards clarifying their way of thinking about the solution by translating it on the solution paper	4.00	0.949	High
8	21	I direct the students to divide the problem into several small goal.	3.88	1.015	High
9	17	I instruct students to search for more information from outside the course on a specific subject	3.73	1.046	High
10	24	I direct the student to clarify her way of thinking about the solution by speaking out loud, as if she were speaking herself	3.65	1.171	High
11	16	I ask the students, for example, to draw a picture of the nerves while they are suffering from heart disease and compare it with a picture of nerves while they are in a normal condition.	3.46	1.080	High
Total			4.01	0.624	High

students' solution and seek to correct and direct the wrong answers in a scientific and calm manner, with mean of 4.63 and a high degree; while item No. (38) "I ask students to compare what have been reached with situations or problems that I specify for them" came last with mean of 3.98 and with a high degree. The average for the evaluation as a whole was 4.33, with a high degree of appreciation. To test the second hypothesis,

Table 5. Means and standard deviations of the third field.

S/N	Rank	Item	Mean	Standard deviation	The degree
1	30	I ensure a safe classroom environment suitable for effective learning and problem solving to occur.	4.56	0.660	High
2	31	I help students to explain all practical concepts and terms in a number of ways.	4.50	0.662	High
3	28	I observe and direct the student's behavior after knowing her failure to reach the correct solution to the problem.	4.37	0.829	High
4	29	I make sure that the student expresses her point of view, and is not restricted to the opinions and ideas of her colleagues.	4.30	0.784	High
5	27	I direct students when solving scientific problems cooperatively.	4.29	0.837	High
6	25	I monitor the students' use of appropriate problem-solving strategies.	4.11	0.876	High
7	26	I make sure that the student relies on herself in solving scientific problems.	4.07	0.882	High
Total			4.32	0.576	High

Table 6. Means and standard deviations of the fourth field.

S/N	Rank	Item	Mean	Standard deviation	The degree
1	32	I follow the students 'solution and strive to correct and direct the wrong answers in a calm and scientific manner.	40.63	0.602	High
2	35	I discuss with the students about the validity of their solution.	40.55	0.630	High
3	36	Use ongoing evaluation strategies as students practice problem solving.	40.49	0.705	High
4	34	I use a follow-up card in which I assess the level of students.	40.45	0.770	High
5	40	I direct the students to review the solution and its steps to ensure its validity.	40.35	0.703	High
6	33	I give an opportunity for groups that are unable to create mental maps have access to the maps of other groups.	40.31	0.848	High
7	37	I ask the students to make sure of the solution by applying it and using it in similar situations.	40.17	0.868	High
8	39	I command the students to present and discuss the solution they found, and clarify its logic and significance.	40.09	0.866	High
9	38	I ask students to compare their findings to situations or problems that I identify for them.	30.98	0.896	High
Total			4.33	0.531	High

means and standard deviations were extracted for the use of metacognition strategies in solving the problem of teachers according to their educational area variables and years of service. Table 7 illustrates this. The results of the previous table illustrate an apparent variation in the mean and standard deviations of metacognitive strategies in solving the problem of teachers due to the different categories of educational region variables and years of service. To demonstrate the significance of the statistical differences between the means, the multiple bilateral variance analysis on the fields the binary variance analysis of the tool as a whole was used as shown in Table 8.

Based on the results included in the previous table, the following is evident:

(i) There were no statistically significant differences (= 0.05) due to the effect of the educational area in all fields except for monitoring and evaluation.
(ii) There are no statistically significant differences (=0.05) due to the impact of experience in all fields except for evaluation.

Based on the results of the previous table, it can be said that there are no statistically significant differences (ه= 0.05) due to the effect of the educational area, where the P-value was 2.405, with a statistical significance of 0.069. Also there were no statistically significant differences (ه=

Table 7. Means and standard deviations of using metacognition strategies to solve problem by teachers according to the variables of educational area they belong to and years of service.

Variables			Understanding the problem	Setting a solution	Monitoring	Evaluation	Total
The educational area teachers belong to	Al Ahmadi	Mean	4.36	3.93	4.20	4.19	4.16
		St. deviation	491	0.580	0.517	0.476	0.462
	Mubarak Al Khabir	Mean	4.21	3.92	4.26	4.28	4.15
		St. deviation	637	0.761	0.650	0.636	0.595
	- Al Asema -Hawalli Al Jahra Private Education	Mean	4.32	4.21	4.53	4.57	4.39
		St. deviation	493	0.519	0.524	0.407	0.431
	Al Farwaniy	Mean	4.18	4.01	4.29	4.33	4.18
		St. deviation	515.	0.598	0.578	0.532	0.489
Years of service	Less than 5 Years	Mean	4.12	3.89	4.21	4.17	4.08
		St. deviation	0.525	0.601	0.604	.604	0.465
	5 - less than 10 Years	Mean	4.35	4.10	4.41	4.49	4.32
		St. deviation	0.567	0.614	0.511	0.434	0.469
	10 Years and more	Mean	4.28	4.01	4.30	4.31	4.21
		St. deviation	0.518	0.633	0.596	0.536	0.520

Table 8. The multiple bilateral variance analysis for the impact of educational area teachers belong to and years of service on the fields of metacognition strategies.

Variance	Fields	Sum of squares	Degrees of freedom	Mean of squares	F value	Significance
The Educational Area	Understanding the problem	0.994	3	0.331	1.169	0.323
	Setting a solution	2.564	3	0.855	2.244	0.084
	Monitoring	3.125	3	10.042	3.252	0.023
	Evaluation	3.665	3	10.222	4.725	0.003
Years of service	Understanding the problem	0.895	2	0.448	1.578	0.209
	Setting a solution	0.753	2	0.376	.988	0.374
	Monitoring	0.663	2	0.332	1.035	0.357
	Evaluation	2.020	2	1.010	3.906	0.022
The mistake	Understanding the problem	56.145	198	0.284		
	Setting a solution	75.424	198	0.381		
	Monitoring	63.432	198	0.320		
	Evaluation	51.194	198	0.259		
Total	Understanding the problem	58.255	203			
	Setting a solution	78.931	203			
	Monitoring	67.415	203			
	Evaluation	57.197	203			

0.05) due to the effect of experience, where the p-value was 2.095, with a statistical significance of 0.126 (Table 9). It is clear that there are statistically significant differences (ه= 0.05) between Al-Ahmadi, Al Asema, Hawalli, Al-Jahra and private education, and the differences came in favor of the capital, Hawalli +, Al-

Table 9. Binary variance analysis for the impact of educational area teachers belong to and years of service on using metacognition strategies when solving problem.

Variance	Sum of squares	Degrees of freedom	Mean of squares	F Value	Significance
The educational area	1.749	3	0.583	2.405	0.069
Years of service	1.016	2	0.508	2.095	0.126
The mistake	47.996	198	0.242		
Total	50.974	203			

Table 10. (Post Hoc) Scheffe test for the impact of the educational area belong to on monitoring and evaluation.

		Means	Al Ahmadi	Mubarak Al Khabir	Al Asema-Hawalli- Al Jahra- The private education	Al Farwaniya
Monitoring	Al Ahmadi	4.20				
	Mubarak Al Khabir	4.26	0.07			
	Al Asema-Hawalli- Al Jahra- The private Education	4.53	0.34*	0.27		
	Al Farwaniya	4.29	0.09	0.02		
Evaluation	Al Ahmadi	4.19				
	Mubarak Al Khabir	4.28	0.08			
	Al Asema-Hawalli- Al Jahra- The private Education	4.57	0.37*	0.29		
	Al Farwaniya	4.33	0.13	0.05	0.24	

Table 11. (Post Hoc) Scheffe test for the impact of years of service on evaluation.

		Mean	Less than 5 Years	5 – less than 10 Years	10 Years and more
Evaluation	Less than 5 Years	4.17			
	5 - less than 10 Years	4.49	0.32*		
	10 Years and more	4.31	0.13	0.19	

Jahra, and private education in both monitoring and evaluation (Table 10).Table 11 reveals the existence of statistically significant differences (ه= 0.05) between less than 5 years and 5 - less than 10 years, and the differences came in favor of 5 - less than 10 years.

Conclusion

After presenting the results of the research, it can be concluded that the degree of use of teachers who teach biology at the secondary stage in the State of Kuwait in terms of metacognition strategic skills related to solving the problem was high despite the difference in the degree of significance of each strategy. This indicates the importance of these strategies for them in solving any problem. This result supports the research of both San`ani and Radwan (2020), which also found that there are high levels related to following metacognition strategies; this means that, as indicated by Iwai's research (2019), they are very keen to choose and use metacognitive thinking strategies that are appropriate for their needs, and development.

It also became clear after conducting the appropriate statistical tests that there is no statistically significant effect in the use of metacognitive strategies in solving the problem among teachers due to the educational area variable to which they belong. This indicates that all the educational districts to which the teachers belong have an equal degree with regard to the significance of using metacognition strategies in solving problems. It was also found that there is no statistically significant effect in the

use of metacognition strategies in solving problems among teachers according to years of service. Experience is not the factor that governs or determines the use of metacognitive strategies. This result is consistent with the results of the research of San`ani and Radwan (2020).

As for the open questions that were presented to the teachers related to the factors that affect their pursuit of metacognition strategies in every class, it came in their entirety that the administrative and technical burdens were placed upon them including the numerical density of students in each classroom, lack of time, shortage of the class, lack of tools necessary for the educational process, the frequent forced transfers between schools or between school districts and the instability of school administrations which are usually subject to rotation from time to time.

On the other hand, a number of teachers stated that there are some obstacles they encounter particularly during the use of metacognition strategies including workbook besides the curriculum. This created a load upon the teacher job, too much written and oral tests and ongoing assessments and so on. The results indicated that teachers did not get the appropriate training to practice metacognition skills inside the classroom as they follow such skills according to their own efforts. Therefore, the researchers suggest the following:

1) Investing the highest level of metacognition skills for teachers in the state of Kuwait to increase the social and psychological compatibility by full integration into curricular activities and activities specifically associated with the educational curriculum.
2) Identifying the factors that enhance the highest level of metacognition skills for teachers in the State of Kuwait in order to activate and generalize them for all grades.
3) Working to overcome everything that hinders the adoption of teachers, not the strategy of thinking metacognitive.
4) Conducting research papers on metacognition skills in all different grades.
5) Comparing the personal characteristics of high-level female teachers to follow metacognitive strategies in solving problems among teachers in the State of Kuwait at the secondary level with other teachers and the rest of the subjects in order to identify the factors that limit the adoption of metacognitive thinking strategies.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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