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EPISTEMOLOGICAL BELIEFS AND THEIR RELATION TO METACOGNITIVE THINKING AMONG UNIVERSITY STUDENTS

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ABSTRACT: *This study aimed at discovering the level of epistemological beliefs and metacognitive thinking among university student. The study also aimed at discovering the relationship between epistemological beliefs and metacognitive thinking. The sample of the study consisted of (516) male and female university student. The results of the study revealed that the level of epistemological beliefs was average. It also showed a high level of metacognitive thinking. Faunally the study also revealed that the level of epistemological beliefs was negatively associated with the level at metacognitive thinking.*

KEYWORDS: Epistemological Beliefs, Metacognitive Thinking, University Students

INTRODUCTION

Epistemology is a critical discipline concerned with the principles of science and the logical bases of these principles (Wahbeh, 1979, p 2); it can be defined also as the theory or the philosophy of sciences; or the study of the principles of science, their assumptions and results critically in order to show their logical basis and objective value. Guven and Belet (2010) defined epistemology as the personal beliefs of the individuals concerning the nature of knowledge and the ways of its acquisition.

Thus, epistemology differs from the study of scientific methodology and their teaching in one hand, and from study of the structure of the scientific laws in the other hand, because the former is part of the applied logic, and the latter is part of the descriptive philosophy or the philosophy of development (Piaget, 1971).

Epistemology is derived from two Greek words: "episteme" which refers to knowledge, and "logos" which means science or study. Thus, based on its derivation, the term epistemology means "the theory of knowledge", or the theory of scientific knowledge. The Scottish

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philosopher J. F. Ferrier was the first theorist who used that term in his book "Institutes of Metaphysics" (Al-Sokkari, 1999).
The educators sought to study the beliefs of students concerning the nature of knowledge, and the way of its acquisition as well as the standards used for the identification of knowledge and its definition. And they sought also to examine the relation which related their beliefs to the learning process, and the way they contribute to facilitating the changes in teaching and learning (Hofer and Pintrich, 1997).

The researcher who first studied those beliefs is William Perry, who listed several stages for the epistemological beliefs which included: Dualism, Relativism, Commitment within Relativism and Multiplicity.

According to Gaston Bachelard, the function of epistemology is examining the impact of knowledge on the structure of thinking and the study of the history of science for the purposes of understanding the scientific dilemmas which challenges the researchers nowadays, and this trend is dominant among French and German philosophers who think that epistemology is concerned with the scientific knowledge (John, 1986).

The researchers of the cognitive school think that the role of epistemology is the study of the development of scientific concepts, so that epistemology relates developmental psychology to general epistemology.

This attitude is reflected in the thinking of Jean Piaget, in his book "the Structural Epistemology", in which he divided epistemology into two sections, the first of which examines and evaluates the principles of science for the purposes of explaining the intellectual development of man and providing a conception for its future. This section is called "the science of the history of knowledge", despite its closer relation to philosophy, in comparison to the modern concept of science. The second section is concerned with the development of the individual knowledge from the date of birth till adulthood , and which aims at explaining the cognitive processes ; analyzing the acquisition of knowledge by the child and explaining the process of intellectual development, and in this case it is called the "structural epistemology"(Piaget ,1971) .

The information processing theorists indicate that knowledge is acquired by humans in a way which is similar to the way a computer processes the information, and that knowledge consists of inputs, outputs and processing. Processing occurs on three levels: coding the information, storing and retrieval (Sternberg, 2003).

Metacognitive Thinking
The concept of metacognitive thinking dates back to Plato and Aristotle (Brown, 1987), but the modern beginnings of the study of metacognition began with Flavell and his colleagues in 1970s of the twentieth century, and were based on their research on Met memory, which showed the presence of memorization strategy, the ability of controlling, modifying and evaluating them consciously (Flavell, Spear, August. 1981).

Metacognitive thinking is considered a new trend in psychology, and James and Dewey described "the metacognitive processes as incorporating the conscious introspection during the thinking process ". This was confirmed by Sternberg, who suggested that this concept emerged

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in for the purposes of constructing a model for controlling knowledge, in order to distinguish the strategic processes during thinking. Kaniel indicates that metacognition is related to the complex processes which occur during cognitive activities (Al-Otoum, 2004).In his first study in this field, Flavell focused on the improvement of the children's ability at memorization through assisting them in the tasks they encounter, and applying the strategies which enhance their memory. According to him, the concept of metacognition refers to the individual knowledge about his cognitive processes and their outcomes and their relevant factors (Flavell, 1976, 232).

Schrew and Dennison (1994, 460) indicate that metacognitive thinking refers to the "ability of the individual at contemplating and controlling his learning". Ormord (1996, p403) suggests that metacognitive thinking implies the knowledge and beliefs of the individuals concerning their cognitive processes, and their attempts at organizing these processes for the purposes of enhancing their learning and memorization. Jarawan (2007, p48) indicated that metacognitive thinking is a complex intellectual skill which is considered among the basic components of smart behavior, and which develops with age and experience, and controls the thinking activities aiming at solving the problems, as well as the use of cognitive abilities and capacities of the individual in the face of the demands of the thinking process.

There are several components and elements related to metacognitive thinking, including: personal knowledge which includes the thoughts of the individual about his nature and the nature of others (Talafhah, 2011); the task knowledge which includes the individual information about the task during the cognitive process, which can be abundant or lacking, ordinary or unordinary, organizes or unorganized, interesting or boring(Al-Otoum , 2004) and the strategy knowledge , which concerns the large amounts of information which can be acquired concerning the settings in which the strategies are effective in achieving the major and minor goals (Al-Otoum, 2004).

Sternberg (Cited in Jarawan, 2002) classified the skills of metacognitive thinking into three main categories: Planning, Monitoring – controlling, and assessment (Al-Otoum, 2004 and Jarawan, 2002).

Few studies dealt with the relation between epistemological beliefs and metacognitive thinking, and which will be reviewed by the researchers in this study.

The study of Guven and Berlet (2011) aimed at examining the relationship between epistemological beliefs and metacognitive strategies among the students. The sample of the study consisted of (820) students from a university in Turkey. The results of the study showed the presence of a relation between epistemological beliefs and metacognitive strategies among the students.

Guven and Belet (2010) aimed at examining the attitudes of the trainees who wish to teach metacognition and epistemological beliefs. The sample of the study consisted of 20 individuals. Results of the study showed that the participants of the study showed an awareness concerning metacognition and epistemological beliefs, and that they think that learning is based on persistence and not on inherited abilities.

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Yilmaz and Topcu (2010) conducted a study which aimed at examining the relationship between the epistemological beliefs of the elementary school students and their metacognition and the school setting. The sample of the study consisted of 626 students from nine public schools in Turkey. Regression analysis showed a correlation between metacognition and the dimension of the total authority in Shumer's scale.

Results of the study showed that school students with the various levels of mastery have different epistemological beliefs and several aspects of metacognition. The results showed also a correlation between metacognition and the dimension of nativity in the scale of epistemological beliefs.

The study of Ishmael (2008) aimed at examining the relationship between epistemological beliefs and metacognitive thinking, and motivation and achievement motivation. The sample of the study consisted of 166 male and female students of first secondary grade at king Abdullah the second for excellence in Irbid, and 110 students who were rejected from the school. The results of the study showed the presence of statistically significant differences between total authority which belongs to the scale of epistemological beliefs and metacognitive thinking and in behalf of the unaccepted students.

Paulsen & Feldman, (2005) conducted a study which aimed at examining the impact of epistemological beliefs on the process of learning self-regulation and motivation strategies among the students at urban university in the USA. The sample of the study consisted of 502 male and female students. The results of the study showed that the students with simple epistemological beliefs are inclined towards using the strategies of self-regulation. The results showed also the presence of an impact of the belief that learning is stable and that knowledge about the strategies of self-regulation.

Paulsen and Feldman (2005) examined the conditional and interaction effects of each of four dimensions of the epistemological beliefs of college students regarding the ability to learn, the speed of learning, the structure of knowledge, and the stability of knowledge on six measures of the motivational components of self-regulated learning strategies (intrinsic goal orientations, extrinsic goal orientation, task value, self-efficacy, control of learning and test anxiety). Students with more sophisticated beliefs about the nature of knowledge and learning were more likely than their peers to use educationally productive motivational strategies in their learning. Beliefs about one’s ability to learn and the structure of knowledge had the most significant and substantial effects on students’ use of self-regulated motivational strategies. Although a student’s belief about the stability of knowledge by itself had a statistically significant effect on only one motivational strategy, this belief did have four statistically significant interaction effects with beliefs about ability to learn and the structure of knowledge.

Schumer and Neber (2000) examined the issue of self-regulated learning among highly gifted elementary (n = 93) and high school students (n = 40) in science. Self-report measures assessed self-regulatory strategy use in science and a spectrum of environmental (perceived level of investigation) and individual prerequisites (motivational beliefs, goal orientation, epistemological beliefs and intentions). Firstly, high school students were experiencing less investigation in science, and test anxiety and work avoidance were more pronounced than with elementary students. Secondly, highly gifted girls' science-related motivational beliefs were less positive than those of boys. Thirdly, path analyses indicate that the level of investigation

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in the science learning environment strongly determines motivational and epistemological prerequisites of self-regulatory strategy use. The results indicate that exploration and discovery should be enabled and strengthened in science classrooms of highly gifted students.

Cole (1997) examined the epistemological beliefs and their relationship to some variables among the university students in Canada. The sample of the study consisted of 101 male and female students. The researcher used the questionnaire of epistemological beliefs. The results showed that the beliefs of the students are simple and not complex and developed. The results showed the presence of a statistically significant correlation between the epistemological beliefs and metacognitive thinking.

Problem of the Study:

The researchers in this study aimed at examining the level of using the strategies of metacognitive thinking among the students and their relation to epistemological beliefs. The researcher thinks that the individual who has epistemological beliefs will inevitably have the skills of metacognitive thinking, and will supervise and regulates himself during the learning process.

This study aims at answering the following questions:

1- What is the level of the student's scores in the scale of epistemological beliefs?

2- What is the level of the student's scores in the scale of metacognitive thinking?

1- Is there a statistically significant correlation at the level (α 0.05) between the scores of the students in the scale of epistemological beliefs and the scale of metacognitive thinking?

The aims of the study:

This study aimed at identifying the level of epistemological beliefs and their relation to metacognitive thinking.

Importance of the Study:

The importance of this study is related to the lack of studies related to examining epistemological beliefs in Jordan. The researchers also thinks that it is necessary to examine the relation between epistimolomal beliefs and the metacognitive thinking, and the researcher thinks that the students at Jordanian universities constitute a convenient sample for the present study . The researcher reviewed the theoretical literature related to the variables of the study, which formed the theoretical background of the present study.

Operational Definitions

Epistemological Beliefs: the beliefs related to the nature of knowledge, and which are calculated in the present study by the score of the student in the scale used in this study.

Metacognitive thinking: the self-awareness of the individual concerning his cognitive processes through the use of a set of skills which include planning , evaluating , regulation , decision making and choosing the appropriate strategies ., and which is calculated through the score of the student in the scale of metacognitive thinking (Schrew and Dennison ,1994).

METHOD OF THE STUDY:

Population of the Study:

The population of the study consisted of all the students registered in the academic year 2013/2014 at Yarmouk University (39000 students).

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Sample of the Study:
The sample of the study consisted of 516 male and female undergraduate students at Yarmouk University in the academic year 2013/2014 that were chosen randomly.
Table (1) illustrates this:
Table (1) the distribution of the participants of the sample of the study according to the variables of the study:

Variables of the Study	Levels of the variable	Frequency	Percentage
Gender	**Males**	109	21.1
	Females	407	78.9
Faculty	**Scientific**	243	47.1
	Humanities	273	52.9
Study level	**Freshman**	140	27.1
	Sophomore	144	27.9
	Junior	114	22.1
	Senior	118	22.9
Total		**516**	**100.0**

Tools of the Study:

Scale of Epistemological Beliefs:
Shimmer's scale (1994) for epistemological beliefs was used in this study, and it was Arabicized and translated and modified by the researchers for the Jordanian setting. The scale consists of 63 items divided into four subscales including: stable ability, simple knowledge, certain knowledge and rapid learning.

Validity of the Epistemological Beliefs in its Original Version
Schommmer's scale (1994) is one of the frequently used scales in this field. The validity and reliability of the scale were calculated through test-retest analysis, through a pilot study which was conducted on a sample of the faculty students through calculating the reliability coefficient by Pearson correlation coefficient (0.74) and in the test –retest (0.85-0.63) and the inter item correlation for each item.

In order to test the validity of the scale of epistemological beliefs it was reviewed by 5 referees from among the teaching stuff at Yarmouk university , Al-Balqa applied university and Jadara private university who are specialists in psychology , educational assessment and evaluation, English language and Arabic . Based on the comments and attitudes of the referees, item. Some items were reformulated in terms of language, and the referees didn't recommend removal of any of the items.

Face Validity:
The researchers applied the tool of the study on a pilot sample which consisted of 50 male and female students in order to determine the face validity of the scale, and the Pearson correlation coefficient was calculated, and the standards for testing the items included: the presence of a statistical significance for the correlation between the score of the subscale and the total score

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of the scale and that the value of the correlation is not less than (0.20). The correlation coefficients were calculated for the dimensions of the scale.

Reliability of the Scale of Epistemological Beliefs

The scale was applied to a pilot sample which consisted of 50 male and female students through the use of test-retest analysis with an interval of two weeks. Pearson correlation was calculated and the values were as follows: (0.77-0.89) for the test and the retest, and for the scale as a whole it was (0.80) and table (2) illustrates the results.

The researchers calculated the internal consistency through Cronbach Alpha coefficient, and the values were as follows (0.70 – 0.79) and for the scale as a whole (0.84).

Table (2): internal consistency coefficients and the retest reliability for the scale and its subscales:

The scale of epistemological beliefs and its subscales	Internal consistency	Retest reliability	Number of items
Stable ability	0.79	0.83	16
Simple knowledge	0.79	0.77	28
Certain knowledge	0.70	0.86	13
Rapid comprehension	0.78	0.89	6
The scale as a whole	0.84	0.80	63

The standards for making judgments on the scale of epistemological beliefs:

The gradual statistical model was used in classifying the means of the epistemological beliefs and its subscales and their items as follows:

Level of belief	The category of relevant means
High	3.67-5
Medium	2.34-3.66
Low	1.2.33

Second: Metacognitive Thinking Scale:

The researchers in the present study used the metacognitive thinking scale which was prepared by Schraw and Dennison (1994) which is used for evaluating the level of metacognitive thinking among adolescents and adults. The scale was translated and modified for the Jordanian setting by the researchers. The scale consisted of 53 items classified into three dimensions: regulation of cognition, knowledge of cognition and processing of knowledge.

Validity of the Scale in its Original Version:

Schraw and Dennison tested the validity of the scale through applying it on a sample of 197 male and female students. The original scale consisted of 120 items. The final version of the scale consisted of 57 items. The factorial analysis showed the presence of two factors for the metacognitive thinking which are the knowledge about cognition and the regulation of knowledge , Cronbach alpha for each factor was (0.91) , and the highest and lowest correlation coefficient were (0.31-0.70). Kumer (1998) analyzed the factorial analysis again and found three factors which included the regulation of cognition, the knowledge about cognition and the processing of knowledge.

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Schraw and Dennison calculated Cronbach alpha coefficient for the scale as a whole, and which was (0.95), while the internal consistency for the scale was (0.91), and Kumer (1998) applied the scale on a sample which consisted of 516 individuals, and calculated internal consistency coefficient through Cronbach alpha formula and the value for the scale as a whole was (0.89) and for the dimensions (0.80-0.68).

For additional checking, the scale was reviewed by 5 referees from among the teaching stuff at Yarmouk University, Al-Balqa applied university and Jadara private university who are specialists in psychology, educational assessment and evaluation, English language and Arabic. Based on the comments and attitudes of the referees, item. Some items were reformulated in terms of language, and the referees didn't recommend removal of any of the items.

Structural Validity

The researchers applied the scale on a pilot sample which consisted of 50 male and female students in order to test the structural validity of the scale and Pearson coefficient was calculated for each item and for the scale as a whole, and the standards for testing the items included: the presence of a statistical significance for the correlation between the score of the subscale and the total score of the scale and that the value of the correlation is not less than (0.20). The correlation coefficients were calculated for the 52 items of the scale.

Reliability of metacognitive thinking Scale

The scale was applied to a pilot sample which consisted of 50 male and female students through the use of test-retest analysis with an interval of two weeks. Pearson correlation was calculated and the values were as follows: (0.82-0.88) for the test and the retest, and for the scale as a whole it was (0.82) and table (3) illustrates the results.

The researchers calculated the internal consistency through Cronbach Alpha coefficient, and the values were as follows (0.85 – 0.91) and for the scale as a whole (0.95) as shown in table three.

Table (3): internal consistency coefficients and the retest reliability for the scale and its subscales:

The scale of metacognitive thinking and its subscales	Internal consistency	Retest reliability	Number of items
Regulation of cognition	0.91	0.82	21
Knowledge about cognition	0.85	0.86	16
Processing of knowledge	0.85	0.88	15
The scale as a whole	0.95	0.95	52

The standards for making judgments on the scale of metacognitive thinking

The gradual statistical model was used in classifying the means of the metacognitive thinking and its subscales and their items as follows:

results of the study:

The results related to the first question: "what is the level of the scores of the students in the scale of epistemological beliefs?"

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In order to answer the question, the means and standard deviations of the rating of the epistemological beliefs of the students and their ratings for the subscales were calculated as illustrated in table 4 below:

Level of belief	The category of relevant means
High	5.1 - 7
Medium	3.1 - 5
Low	1-3

Table (4):
Means and standard deviations of the scale of epistemological beliefs and its subscales:

Rank	Number of subscale	The scale of epistemological beliefs and its subscales	Means	Standard deviations
1	**4**	**Rapid comprehension**	3.259	0.51
2	**2**	**Simple knowledge**	3.176	0.23
3	**3**	**Certain knowledge**	2.543	0.34
4	**1**	**Stable ability**	2.469	0.30
The scale as a whole			2.874	0.16

Table 4 shows that the level of epistemological beliefs among the students was medium, and the subscales were as follows:

a- The subscale of rapid comprehension was ranked first with a (medium) level of belief.
b- The subscale of simple knowledge was ranked second with a (medium) level of belief.
c- The subscale of certain knowledge was ranked third with a (medium) level of belief.
d- The subscale of stable ability was ranked first with a (medium) level of belief.

The results related to the second question: what is the level of the scores of the students in the metacognitive thinking scale?"

In order to answer the question, the means and standard deviations of the rating of the epistemological beliefs of the students and their ratings for the subscales were calculated as illustrated in table 5 below:

Table (5):
Means and standard deviations of the scale of metacognitive thinking and its subscales:

Rank	Number of subscale	The scale of metacognitive thinking and its subscales	Means	Standard deviations
1	1	**Regulation of cognition**	5.221	0.84
2	3	**Processing of knowledge**	5.153	0.85
3	2	**Knowledge about cognition**	5.139	0.77
The scale as a whole			**5.176**	**0.79**

Table 5 shows that the level of metacognitive thinking among the students was high, and the subscales were as follows:

a- The subscale of regulation of cognition was ranked first with a (high) level of belief.
b- The subscale of processing of knowledge was ranked second with a (high) level of belief.
c- The subscale of knowledge about cognition was ranked third with a (high) level of belief.

The results related to third question of the study:" is there a statistically significant correlation (α =0.05) between the scores of the students in the scale of epistemological beliefs and their scores in the scale of metacognitive thinking?"

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In order to answer this question, the correlation coefficients related to the level of the epistemological beliefs (α =0.05) and the scores of the metacognitive thinking through the use of Pearson coefficient , as illustrated in table 6.

Table (6): correlation coefficients related to the epistemological beliefs and metacognitive thinking among the students:

Correlation	Statistics	Regulation of cognition	Knowledge about cognition	Processing of knowledge	metacognition
Stable Ability	**Correlation coefficient**	-0.29	-0.23	-0.23	-0.27
	Statistical significance	0.000	0.000	0.000	0.000
Simple knowledge	**Correlation coefficient**	0.17	0.17	0.15	0.17
	Statistical significance	0.000	0.001	0.000	0.000
Certain knowledge	**Correlation coefficient**	-0.35	-0.29	-0.28	-0.33
	Statistical significance	0.000	0.000	0.000	0.000
Rapid comprehension	**Correlation coefficient**	0.07	0.05	0.02	0.05
	Statistical significance	0.101	0.248	0.698	0.239
Epistemological beliefs	**Correlation coefficient**	-0.16	-0.12	-0.12	-0.15
	Statistical significance	0.000	0.007	0.002	0.001

Table (6) shows that the level of epistemological beliefs among the students is correlated to the level of metacognitive thinking inversely (negatively) and statistically weak.

Table 6 shows also that the level of metacognitive thinking as a whole is related to the level of epistemological beliefs among the students inversely and in a weak statistically manner, with the exception that the level of metacognitive thinking is related to the level of rapid comprehension among the students positively but statistically insignificant.

Procedures of the study:

Upon testing the validity and reliability of the epistemological beliefs scale and the scale of metacognitive thinking, the researchers followed the procedures listed below:

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1- An official formal permission was requested for applying the tools of the study on the sample of the study with the provision of the relevant instructions.
2- The tools of the study were applied on the whole sample, and 63 questionnaires were excluded.
3- The data were analyzed by using the SPSS software and the results of the study were derived.

Variables of the study

Epistemological beliefs:
Metacognitive thinking:

DISCUSSION:

The results of the first question indicated that the scores of the students in the scale of epistemological beliefs were medium with a mean of (2.874), which means that the beliefs of the students were neither simple nor complex, and that they are reluctant in their beliefs, because the beliefs of the students are not stable. The belief in the stability or changeability of knowledge is related to several reasons. There are facts, which people consider to be stable such as the existence of the Creator in religions including Islam , while there are unstable scientific facts , which can be ascribed to the structure of epistemological beliefs which we begin to form early in life , but they take a long time until they reach their final versions . The university study is a stage in which the beliefs of the students are formed and developed, and they can be negated or refuted at this stage, and the process of forming the beliefs is complex and lasts for the whole life time.

Concerning the dimension of rapid comprehension, it came first with a mean of (3.259) and a standard deviation of (0.51), which can be ascribed to the fact that learners learn quickly, and they can acquire knowledge at last. Students of university have a set of beliefs which form their basic cognitive structure, and that they think that facts do not change, and that any individual who exerts a sufficient effort discovers the truth, and those students believe that what is imaginary now can be factual later. Those beliefs are easily understood by the students, thus they were ranked first.

Concerning the simple knowledge, it came second with a mean of (3.176) and a standard deviation of (0.23). Simple knowledge refers to the avoidance of integration in the acquisition of knowledge, which implies that the belief about the structure of knowledge may range between the belief that knowledge is characterized as separate information and to the belief that knowledge is complex interrelated networks. Simple knowledge indicates that facts are certain and absolute and can be transmitted through the authority, while the complex knowledge refer to the belief that facts are relative and can be changed and rebuilt effectively by the individual. These differences result in the presence of differences in the beliefs of the students.

In the third rank, there is the dimension of certain knowledge with a mean of (2.543) and a standard deviation of (0.34). Here, the beliefs of the students that knowledge is stable and cannot be changed leads to their avoidance of mystery in learning, and they believe that

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successful students comprehend rapidly and work hard at solving problems and for a long period of time, which is useful for intelligent students.

Lastly, the dimension of stable ability came with a mean of (2.469) and a standard deviation of (0.30). This dimension indicates that the ability to learn is native and that success is not based on hard work. Thus, the students who hold these beliefs think that excellence requires a lot of work and that success requires diligence.

DISCUSSION OF THE RESULTS OF THE SECOND QUESTION

The results of the second question indicated that the level of metacognitive thinking among the participants of the sample of the study was high , with a mean of (5.176) , a fact ascribed by the researcher to the abstract thinking processes among the university students , which are part of metacognitive thinking skills , and those students are able to practice the complicated and advanced cognitive processes at this stage , such as the researchers who attempt at solving problems and proposing solutions and making hypotheses as well as constructing theories in a systematic manner . This result can be ascribed to the nature of the study subjects at university, as well as the interaction and discussion among the students which are used for self-assessment. Concerning the fields of metacognitive thinking, the regulation of cognition has the first rank with a mean of (5.221) and a standard deviation of (0.84), and the processing of knowledge came second with a mean of (5.153) and a standard deviation of (0.77), which were with a high level, and it can be noticed that these fields are similar in their levels. This fact is ascribed by the researcher to the fact that university students are at a mature stage intellectually, and that they have the ability to think logically and abstractly, as well as skills of planning, organizing, controlling and supervising the cognitive processes.

This result is ascribed by the researcher to that both the regulation of cognition , processing of knowledge and the knowledge about cognition work together in order to improve the performance of the learners among the students of university , and the high level of the regulation of knowledge in comparison to the processing of knowledge and the knowledge about cognition can be ascribed to that it is more stable , the processing of knowledge by the individual differs from a situation to another and it depends on context.

DISCUSSION OF THE THIRD QUESTION:

The results of the third question showed a correlation between epistemological beliefs and metacognitive thinking as a whole and its subscales inversely (negatively) with a weak statistical significance. This result is explained by the researcher in that epistemological beliefs constitute the individual persuasions and his certainties concerning the thoughts he believes in (beliefs), and whenever the individual thinks that his information are valid, his metacognitive skills such as planning, supervision and assessment are weak, so that the individual doesn't practice these processes, except when he is uncertain about the validity of his information, thus the correlation was inverse.

The results showed also that the level of metacognitive thinking was related to the level of epistemological beliefs among the students in an inverse manner negative statistically and significant , this is ascribed by the researcher to the fact that whenever the level of

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metacognitive thinking increases , the level of epistemological beliefs decreases and vice versa .

RECOMMENDATIONS:

Based on the results of the study, the researcher recommends the development of educational programs aiming at developing the seismological beliefs and improving the skills of metacognitive thinking among university students.The researcher recommends also conducting more correlational studies concerning the epistemological beliefs and metacognitive thinking, which take into consideration the effect of variables such as gender, academic year...etc.

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