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RESEARCH ARTICLE

METACOMPREHENSION LEVEL AMONG A SAMPLE OF AL-QASSIM UNIVERSITY
POSTGRADUATES IN LIGHT OF SOME VARIABLES

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ABSTRACT

The study aimed to explore the metacomprehension level among a sample of Al-Qassim university postgraduates in light of gender, academic level, major (scientific or literary) and the achievement level. Schraw and Dennison (1994) test modified for the Arab environment by Jarrah and Obeidat (2011) was employed. Content validity is established by examining what each item tests, sources of obtaining items, formation of items and methods of arbitrating items. Correlation coefficients between the scores of Yadak (2011) tests and the current one employed is calculated to ensure test reliability. The sample included (1102) students registered for the first semester in the academic year 2014/ 2015 at Al-Qassim University, college of arts and sciences- Al Rass, from different educational levels; 1st, 2nd, 3rd, and 4th years. It was found that the students have a high level of metacomprehension on each dimension and on overall test. Statistically significance differences are found at ($\alpha=0,05$) based on; gender in favor of the females; achievement level in favor of high level achievement students and on the dimension of knowledge organization based on major in favor of literary majors. But no significant differences based on educational level and major are found.

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INTRODUCTION

Metacomprehension research began in the eighties and was directed toward metacomprehension role in actual understanding, what made it an important subject for scientific studies. Research proved that learners of different age groups score low accuracy levels in judging learning and texts comprehension. There is a prevailing belief among some researchers that learner's failure in comprehension is due to their abilities low levels or lack of motivation (Ma, 2008). However, some cognitive psychologists attribute comprehension failure in part to the misuse of remedial strategies while reading texts (York, 2006). Comprehension is differs from metacomprehension. Abd Al-Qader (2002) explains that comprehension is retrieving the proper meaning by linking the idea, meaning and symbols, depending on the context and ideas organization and application to fulfill the activities practiced by human. Jarwan (1999) says that comprehension degree is determined by learners prior knowledge, the larger the prior knowledge of the read text, the deeper comprehension becomes, i.e. if the reader has broad prior knowledge his chances of assimilating the different parts of the text are more, because the knowledge an individual has allows for easier comprehension of the content.

He also confirms that prior knowledge does not constitute readers knowledge of the topic he is dealing with only, but the cognitive structure of this knowledge also, i.e. the method that the individual uses to organize knowledge, comprehension methods he owns because of linguistic skills in general and knowing the target in particular. Qatami (1990) found a variation in cognitive strategies used by students in learning. Student's having low learning ability doesn't have advanced cognitive strategies; they need the aid of their teachers to change their strategies and to use methods and strategies appropriate to their abilities. Low comprehension students use unsui Table cognitive strategies for certain tasks, they don't know if these tasks require inference of the general meaning of the text or depends on prior knowledge, and hence low comprehension students need direct teaching to enhance their comprehension (Swanson & Delapaz,1998).

Az-zayat (1998) believed that comprehension depends on physical, environmental and psychological aspects of the student. Low comprehension students lack motivation to read because of their limited knowledge, feeling anxiety as a result of reading weak comprehension. Metacomprehension concept entails using metacognitive strategies to achieve goals as assessment of text comprehension level. Experience is preceded by a cognition activity; that is when a student reads a certain text and does not understand it, he starts using metacomprehension to remedy the situation including metacomprehension effectiveness, learners' cognition of his

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own learning and knowing when to use remedial actions. Remedial action occur automatically when errors in text comprehension is recognized (Thiede & Anderson, 2003)

Metacomprehension importance in learning

Metacomprehension is associated with minute control of learning, for effective organization of studying. This means if a learner is able to distinguish between the well learned and low learned materials, there is a possibility that he may be able to compensate for the difference in learning by allocating study time, i.e. giving more time for low learnt material and less time on better learnt material. Accordingly, self-monitoring of learning and effective organization of the study is assumed to produce better learning, and therefore increases metacomprehension (Thiede & Anderson; 2003).

Self-organization and reduction of dissonance suggest that self-monitoring affects learning by affecting the study organization. This means that accurate monitoring leads to more effective organization. Revising the text entails using a set of self-organizing procedures such as; setting goals, find important information in the text which in turn leads to more comprehension, the ability to distinguish between well comprehended and bad comprehended texts may help explain metacomprehension increase (Graham & Harris; 1994)

Pintrich and Degroot (1990) indicated that self-organization is expresses learners cognitive activities that helps in choosing information, make correlations to form cornerstone of the learned information as a short title or selecting a main idea, to enable the learner of reaching a degree of metacomprehension. Self-organizing include;

Self-appraisal cognition. Personal impressions of the self about abilities and cognition in addition to most effective means appropriate to individuals' cognitive level, available abilities, motivations and the features that a learner owns. These impressions answer the questions that a learner has in processing a certain task such as "what do you know?", "how do you think?" and when do you use a certain knowledge or strategy in a certain situation and why?", Self-appraisal cognition may be classified into three cognitive forms; declarative knowledge, procedural knowledge and conditional knowledge. Declarative knowledge expresses the process of awareness of skills and strategies required in processing a certain situation that is, the learner must be aware of the quality of skills and strategies that ensures passing the situation. Sometimes it is called semantic knowledge, it is related to facts, concepts, ideas, rules, principles and theories; ie theoretical and academic knowledge such as reading texts or answering certain questions. Procedural knowledge expresses a group of procedures that lead to achieving a goal or goals such as: planning, choosing the proper strategy, and allocating time and effort required for a certain task. Conditional knowledge refers to learners' perception of reasons of choosing a certain strategy, when it is possible to change the strategy and use an alternative one. Conditional knowledge is related with when, why and how procedural and declarative knowledge integrate in the learning process. (Abdel Sabour; 2000)

Self-management cognition. It is a series of mental processes that help the individual in organizing different aspects related to problem solving. Mental processes include the following aspects:

Planning; it has three main tasks according to Graham and Harris (1989)

- Learners ability to identify the goals that he seeks to achieve from learning.
- Customize a plan to achieve the goal. This includes choosing the appropriate implementation strategy for the task.
- Predict possible obstacles and errors that impede implementing the plan, in addition to determining the styles to confront these obstacles and errors.

Self-monitoring. Refers to the strategies used by the learner to monitor implementing the plan and to follow-up it to achieve cognitive goals. Monitoring is believed to occur when the reader starts assessing his comprehension in terms of clarity of the purpose and distinguishing between important and secondary information. The teacher may be a model in explaining the way of monitoring by using supportive skills such as guiding the learner in self-questioning and summarizing to deepen learners' metacomprehension processes (Pitts; 1989). Self-evaluation. It refers to learners ability to determine standards of performance, to notice his errors and to correct them in order to improve learning process (Abdel Sabour; 2000).

LITERATURE REVIEW

Many authors examined the relation of metacomprehension and other variables such as grade or age group, educational level, major and gender. Regarding metacomprehension and age group Moor, Zabrocky and Commander (2005) examined the effect of age group on metacomprehension. Adolescents (No. 30) and adults (No. 30) from Georgia –USA participated in the study. The authors utilized the metacomprehension test. It was found that adolescents metacomprehension skills are statistically significant. Zabrocky and Moore (1999) studied metacomprehension ability in young and old people.

They used organization and assessment processes on a sample of (40) old participant comprehension of narrative and explanatory texts, who were provided with four narrative and four explanatory texts, they completed metacomprehension test. statistical significant differences were found in metacomprehension of explanatory texts compared with narrative texts in favor younger participant. In the same respect Lin, Moore and Zabrocky (2000) studied comprehension of expository and narrative texts among younger and older adults. One hundred twenty participant (sixty post graduate and graduate, sixty old graduates and church members) were provided with narrative and explanatory texts, then they completed metacomprehension test. No statistical significant differences were found in narrative texts metacomprehension in both groups, but statistical differences were found in explanatory texts metacomprehension in favor of the younger participants group.

Rawson, Dunlosky and Thiede (2000) studied rereading effect on metacomprehension and academic achievement. Students (No. 80) randomly chosen from University of Kent were recruited in the study and assigned to two experimental groups. The first group read seven texts once and the second read them twice, then they completed metacomprehension test. The second group academic achievement increased metacomprehension accuracy. Long (1985) investigated the effects of cues associated with metacomprehension among university students achievement. Students (No. 63) from the University of Tennessee randomly chosen participated in the study. They were assigned to an experimental and a control groups. The experimental group received cues about the metacomprehension skills, the control group received nothing. The experimental group academic achievement increased significantly, they achieved higher marks compared with the marks of the control group who didn't use metacomprehension skills.

Gender was not a significant predictor of metacomprehension in Kolic-Vehovec and Kolic-Vehovec and Bajanski (2006) study which aimed to explore the effects of metacomprehension and perceived use of reading strategies as predictors of reading comprehension in higher elementary schools. Participants were students (N.= 526) from the fifth to the eighth grade from Rijeka, Croatia (201 girls and 325 boys). Bukaiei (2010) aimed at measuring the level of metacomprehension and problem solving skills among 10th grade high-achievers in the schools of UNRWA/ Irbid. A sample of (108) students randomly selected participated in the study. Two scales were administered one of which measures metacomprehension. Results proved a high level of metacomprehension among the participants. Statistically significant differences in metacomprehension is found in favor of females.

Regarding metacomprehension and gender Al-Gharaibeh and Al-Zahrani (2014) in a recent study didn't identify any significant difference between male and female students on metacomprehension skills, students (No. 96) from King Saud University participated in the study. Apparent differences in means of scores among males and females on academic achievement due to metacomprehension abilities were found. Metacomprehension and major was tackled by ZHAN Xian-jun, and ZHAO Jing-mei (2012). They studied the effect of metacognitive competence by comprehensive cultivation on juniors and seniors majoring in foreign language and found a positive influence of the major on metacognitive competence. There is a gap in this field and the current study attempted to bridge this gap by taking the major as a variable for studying.

STUDY PROBLEM

If students metacomprehension about their knowledge on a certain topic is not accurate, they may not know that knowledge gaps exist and, thus, are less likely to correct them. The author noticed weakness in metacomprehension on the local level. Awareness of metacomprehension skills is importance for learners; their awareness and ability to assess own comprehension facilitates using metacomprehension skills to ensure achieving goals such as problem-solving and

detecting less comprehension working on it for better performance. Metacomprehension studies volume local wise and metacomprehension importance in the educational process and in labor market urged the author to do undertake more research. Therefore, the current study aimed at exploring metacomprehension among Al-Qassim university postgraduates faculty of science and arts at Ar-Ras in light of educational level, major, gender and achievement. Which may benefit educational process in general and students achievement in particular. Accordingly, the main question is addressed here;

Is there a significant difference in metacomprehension level among Al-Qassim university postgraduates faculty of science and arts at Ar-Ras as on the overall test and based on academic level, major (literary or scientific), academic achievement and gender?

Importance of the study

The study explores metacomprehension among Al-Qassim university postgraduates, a group that will be qualified for teaching when graduated. This group require more ability to deal with written material by having metacomprehension skills. The study is believed to be a part of the theoretical and practical literature that highlights metacomprehension, theoretically it may add new knowledge to the educational thought, and is believed to be the core for further studies in future. Lack of Arabic and local studies examining the level of metacomprehension, urged the author to undertake the current study.

Procedural definitions

- **Metacomprehension:** Is the learners' awareness of mental processes used in reading or solving problems through;
- **Knowledge organization:** is the learners' use of planning, information management and assessment. It is measured by the scores the learners achieve on items of organization.
- **Knowledge of knowledge:** It is measured by the scores achieved on dimensions of declarative, procedural and conditional knowledge.
- **Knowledge processing:** It is measured by the scores achieved on students ability to use strategies and abilities of knowledge management.
- **Academic achievement:** Is the average based on students' self-records. Means of students averages of the sample scored (2.75), standard deviation of (6.60); achievement is divided to high (3.70 and above), average (2.40-3.69) and low achievement (less than 2.39).
- **Major:** Is the students' major based on the faculty he studies in, it include literary and scientific majors.
- **Educational level:** It is the duration spent in the university, it is categorized into four levels (studied less than 34 credited hours (1st year), 34-66 credited hours (2nd year), 67-99 (3rd year) and more than 100 credited hours (4th year).

Study limitations

Generalization of the results may be inhibited by the following:

Validity and reliability of the test, the participants from Al-Qassim university postgraduates faculties of science and arts at Ar-Ras. Hence the results are valid to generalize only on the population of this study and similar populations.

MATERIALS AND METHODS

Participants

Population of the study consisted of all postgraduates registered in the academic year of 2014/ 2015 at Al-Qassim university faculties of science and arts/ Ar-Ras. The participants (No. 1102) student registered in the first semester at the university from all four levels (1st to 4th year) conveniently selected, Table (1) reveals distribution of the participants based on year and major in both literary and scientific faculties.

Independent variables

- Major has two categories; scientific and literary majors.
- Academic level; 1st, 2nd, 3rd and 4th years.
- Academic achievement; high, average and low achievement.
- Gender; males and females.

Dependent variables

- Metacomprehension level measured by the scores on the different dimensions of the test.

Kumar (1987) repeated factor analysis of the test and produced three dimensions:

- Regulation of cognition, it illustrates the ability of planning, information management and assessment, items to measure this dimension are 1, 4, 6, 8, 9, 11, 21, 22, 23, 24, 25, 36, 38, 41, 42, 43, 44, 49, 50, 51, 52.
- Knowledge of cognition, it refers to declarative, procedural and conditional knowledge, items to measure this dimension are: 3, 5, 7, 10, 15, 16, 17, 18, 20, 26, 27, 29, 30, 32, 33, 35.
- Knowledge processing, it is strategies and skills used in information management, items to measure this dimension are: 2, 12, 13, 14, 19, 28, 31, 34, 37, 39, 40, 45, 46, 47, 48.
- The metacomprehension test version implemented was adapted to Arabic environment by Jarrah and Obeidat (2011). Competent professors reviewed and compared the versions of the test.

Test Validity

Shraw and Dennison (1994) conducted factor analysis and found two factors of metacomprehension thinking; Knowledge of knowledge and knowledge organization these have explained (65%) of the difference. Kumar (1998) reanalyzed the test and produces three factors; knowledge organization, knowledge of knowledge and knowledge processing. Knowledge organization was found in (15) items, knowledge of knowledge was found in (11) and knowledge processing was found in (11) items, each factor satisfaction scored more than (0.40), while all the factors explained (28.1%) of the difference.

Table 1. Distribution of the sample based on academic year, gender and major in literary and scientific faculties

Major	academic year	gender		overall	percentage
		female	percentage		
Scientific	1 st	19	9%	27	10%
	2 nd	63	31%	63	22%
	3 rd	75	37%	92	33%
	4 th	45	23%	96	35%
Total		202	42%	278	58%
Literary	1 st	43	11%	27	11%
	2 nd	130	34%	81	34%
	3 rd	119	31%	72	31%
	4 th	94	24%	56	24%
Total		386	62%	236	38%
Overall		1102			622

Table 2. Correlation Coefficient of Metacomprehension Based on Test Dimension and Overall Test

Dimensions	knowledge organization	knowledge of knowledge	knowledge processing	Overall test
knowledge organization	-	0.66*	0.79*	0.95*
knowledge of knowledge	-	-	0.55*	0.83*
knowledge processing	-	-	-	0.86*

Functional at (α=0,05)

Instrument

Metacomprehension test first used by Schraw and Dennison (1994) is employed in the study in its local version. The authors developed the test based on several theories; knowledge organization is developed based on Jacobs and Paris (1987) theory, knowledge of knowledge is developed based on Brown (1987) and Jacobs and Paris (1987) theories.

Jarrah and Obeidat (2011) verified the test validity. Eight professors majoring in educational psychology from Yarmouk University reviewed the version of the test. They provided some remarks on the test items in terms of dimension representation, suitability to the age group, and the structure of the items. Comments were considered and items were corrected. The test was administered on a pilot sample of (49) students to verify the construct validity.

Table 3. Internal consistency coefficient based on overall all test, dimensions and test retest reliability

	Schraw and Dennison (1994)	Kumar (1998)	current study	
			Cronbach alpha	test retest reliability
knowledge organization	0.91	0.80	0.89	0.66
knowledge of knowledge	0.91	0.68	0.80	0.73
knowledge processing		0.73	0.73	0.62
Overall	0.95	0.89	0.93	0.73

Correlation coefficients were calculated for each item with the total score of the dimension as well as for each item with total score of the test. Items (1, 25) were excluded from the knowledge organization, items (7, 15, 16, 17) were excluded from knowledge of knowledge and items (28, 37, 45, 48) were excluded from knowledge processing, because excluded items coefficients scored less than (0.30). Pearson correlation coefficient between dimensions and of the test as a whole were calculated as seen in Table (2).

For the current study the author verified the scale as follows: Content validity was established as explained above by Jarrah and Obeidat (2011). Criterion-related validity was verified by calculating correlation coefficients between subjects scores on the metacomprehension test constructed by Yadak (2011) and the scores on Schraw and Dennison (1994) test which was adapted by Jarrah and Obeidat (2001) to the Arabic environment. Test reliability was established by Schraw and Dennison (1994), they calculated internal consistency coefficient using Cronbach Alpha equation, the score was (0.91) in each dimension. Kumer (1998) calculated internal consistency coefficient using Cronbach Alpha equation based on overall test and each dimension. Values scored (0.68 – 0.80), Table (3) presents these values referring to high test reliability.

Jarrah and Obeidat (2011) verified the test validity through: first, implementing the test on a pilot sample of (72) student and calculating internal consistency coefficients of dimensions and overall test. Second, test retest is measured by testing a sample of (49) students and retesting them after an interval of two weeks, values scores ranged between (0.62-0.73) as observed in Table (3). Two week test retest reliability study on a pilot sample of (50) students found that Pearson correlation coefficient scored (0.93), and Cronbach internal consistency scored (0.91) two values considered appropriate for the purpose of the study.

Total final number of items was (42), to measure participants' metacomprehension level, they were instructed to answer each item according to their level of certainty on a 5-point likert type scale ranging from (1) Never, (2) Rarely, (3) Sometimes, (4) Often and (5) Always. Accordingly, the score of knowledge organization values ranged between (19-95), knowledge of knowledge scores ranged between (12-60) and knowledge processing scores ranged between (11-55), overall scores of the test ranged between (42-210). To judge levels of metacomprehension the scores were converted into (1-5) degrees and the categories were: (1-2.33) low metacomprehension level, (2.34-3.67) averaged metacomprehension level and (2.68-5) high metacomprehension level.

RESULTS AND DISCUSSION

The study attempted to answer the following main questions “Is there a significant difference in metacomprehension level among Al-Qassim university postgraduates faculty of science and arts at Ar-Ras as on the overall test?” Is there a significant difference in metacomprehension level among Al-Qassim university postgraduates and based on academic level, major (literary or scientific), academic achievement and gender?”.

To answer the first question means and standard deviations of the overall test are calculated and for the dimensions as presented in Table 4.

Table 4. Means and Standard Deviations of Students Overall Performance on Metacomprehension and dimensions

dimensions	participants No.	Means	SD
knowledge organization	1102	3.76	0.51
knowledge of knowledge	1102	3.43	0.54
knowledge processing	1102	3.4	0.51
overall	1102	3.35	0.40

High metacomprehension level is observed among the participants, overall mean test value scored (3.35), and the standard deviation scored (0.40). knowledge organization scored first (M=3.76) and (SD=0.51), followed by knowledge of knowledge which scored average (M=3.43) and (SD=0.54), knowledge processing scores were low (M=3.40) and (SD=0.51), but overall value was high.

Table 5. Means and standard deviations of students metacomprehension level based on academic level, major, academic achievement and gender

dimension		M.	SD.
gender	male	3.76	0.51
	female	3.85	0.49
major	scientific	3.70	0.52
	literary	3.65	0.46
academic level	1st	3.86	0.454
	2nd	3.40	0.51
	3rd	3.56	0.489
	4th	3.34	0.455
academic achievement	high	3.83	0.47
	average	3.68	0.49
	low	3.75	0.45
overall		4.80	4.75

To answer the second question of “Is there a significant difference in metacomprehension level among Al-Qassim university postgraduates and based on academic level, major (literary or scientific), academic achievement and gender?” means and standard deviations of students metacomprehension level based on academic level, major, academic achievement and gender as presented in Table (5).

Table 6. MANCOVA analysis of metacomprehension means differences based on variables

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Gender	1.166	1	1.660	5.40	0.025
Major	0.68	1	0.680	3.10	0.075
Academic Level	0.543	3	0.185	0.942	0.456
Academic Achievement	3.323	2	1.656	7.202	0.000
Error	248.93	1094	0.219		
Overall	16513.91	1102			

Statistically significant differences were noticed in Table (5) between students' performance means on the metacomprehension test based on the study variables, MANCOVA analysis was carried out to recognize the function of the differences. The results are shown in Table (6).

Statistical significant differences were noticed in Table (6) at ($\alpha=0.05$) due to the student gender in favor of females. Mean of females performance scored (3.85), while males scored (3.76). Functional differences due to academic achievement level at ($\alpha=0.05$) were seen also, to recognize the source of the differences between the three groups Scheffe test is implemented, Table (7) shows the scores.

Table 7. Scheffe test of metacomprehension three groups

Source of variance	average	high	average	low
high	3.94		0.11*	0.14*
average	3.83			0.03
low	3.8			

*functional at ($\alpha=0.05$)

In Table (7) it is noticed that there are significant differences in metacomprehension at ($\alpha=0.05$) between high achievers and averaged achievers in favor of high achievers, scores mean was (3.83). Differences at ($\alpha=0.05$) are also noticed in comparing means of high and low achievers in favor of high achievers. No statistical differences between average and low achievers are found.

Table 8. Means and standard deviations of students metacomprehension level based on the study variables

		knowledge organization		knowledge of knowledge		knowledge processing	
		M.	SD.	M.	SD.	M.	SD.
gender	male	3.76	0.52	3.77	0.51	3.83	0.49
	female	3.90	0.50	3.78	0.50	3.91	0.48
major	scientific	3.78	0.54	3.74	0.52	3.86	0.49
	literary	3.85	0.49	3.79	0.49	3.88	0.48
academic level	1st	3.85	0.48	3.76	0.51	3.85	0.47
	2nd	3.83	0.52	3.76	0.49	3.89	0.49
	3rd	3.87	0.54	3.80	0.52	3.88	0.48
	4th	3.78	0.49	3.74	0.49	3.83	0.49
academic achievement	high	3.90	0.50	3.85	0.50	3.97	0.49
	average	3.80	0.55	3.75	0.51	3.85	0.49
	low	3.75	0.51	3.73	0.48	3.81	0.48

To answer the second part of the question "differences of metacomprehension level among the participants based on test dimensions, and whether the differences differ means and standard deviations are calculated for each variable as seen in Table 8. In Table (8) it is noticed that there are statistical differences between means of students performance on metacomprehension test based on gender, major, academic level and academic achievement.

To recognize differences statistical significant MANOVA analysis is implemented as seen in Table 9. From Table (9) it is noticed that gender has a significant effect at ($\alpha=0.05$) on knowledge organization, the differences were in favor of females scoring a mean of (3.90) while males mean scored (3.76); with respect to major it was in favor of literary streams scoring (3.85), while scientific major scored (3.78); academic achievement had a significant effect on knowledge organization, to recognize the differences group Scheffe test is implemented, Table (10) shows the scores.

Table (10) showed that statistical differences at ($\alpha=0.05$) in mean scores among high achievers and average and low achievers in favor of high achievers, means were (3.88), (3.78) and (3.77) for high, average and low achievers respectively. These results indicate that high achievers have more knowledge organization skills. Significant differences at ($\alpha=0.05$) are found in knowledge of knowledge due to academic achievement as seen in Table (9) above, to recognize the differences in variables means Scheffe test is implemented,

Table (11) shows the scores. Statistical significant differences at ($\alpha=0.05$) are noticed in Table (11) in means comparisons of high, average and low achievers, in favor of high achievers, scores are (3.92), (3.82) and (3.77) for high, average and low achievers respectively. These results indicate that high achievers have more knowledge of knowledge skills.

In knowledge processing the third dimension it was noticed that there are statistical differences at ($\alpha=0.05$) due to gender in favor of females, there scores were (3.91) while males scored (3.83). Statistical difference was also found at ($\alpha=0.05$) due to academic achievement. To recognize the differences in variables means Scheffe test is implemented, scores are noticed in Table (12).

Table 9. MANOVA analysis of the differences in metacomprehension means based on the study variables

Source of Variance	Variable	Sum of Squares	df	Mean	F	Sig.
Gender Hoteling's Trace=.025 P=0.000	knowledge organization	3.544	1	3.544	12.899	0.000
	knowledge of knowledge	0.02	1	0.022	0.082	0.765
	knowledge processing	1.109	1	1.109	4.431	0.036
Major Hoteling's Trace=.025 P=0.000	knowledge organization	1.629	1	0.635	5.917	0.014
	knowledge of knowledge	0.635	1	0.003	2.343	0.123
	knowledge processing	0.003	1	0.769	0.011	0.915
Academic level Hoteling's Trace=.025 P=0.000	knowledge organization	0.832	3	0.277	1.008	0.387
	knowledge of knowledge	0.783	3	0.261	0.953	0.408
	knowledge processing	0.525	3	0.175	0.698	0.553
Academic Achievement Hoteling's Trace=.025 P=0.000	knowledge organization	2.828	2	1.404	5.144	0.006
	knowledge of knowledge	2.808	2	2.049	5.178	0.006
	knowledge processing	4.098	2	0.165	8.186	0.001
Error	knowledge organization	300.96	1094	275		
	knowledge of knowledge	296.531	1094	271		
	knowledge processing	273.87	1094	250		
Overall	knowledge organization	300.663	1101			
	knowledge of knowledge	280.316	1101			
	knowledge processing	234.794	1101			

Table (12) showed statistical significant differences at ($\alpha=0.05$) in means comparisons of high, average and low achievers, in favor of high achievers, scores are (3.98), (3.87) and (3.78) for high, average and low achievers respectively. These results indicate that high achievers have more knowledge processing skills.

Table 10. Scheffe test of knowledge organization

Source of variance	M.	high	average	low
high	3.88		0.10*	0.15*
average	3.78			5.00
low	3.77			

Table 11. Scheffe test between academic achieving levels on knowledge of knowledge

Source of variance	M.	high	average	low
high	3.92		0.10*	0.15*
average	3.82			0.03
low	3.77			

* significant at ($\alpha=0.05$)

Table 12. Scheffe test between academic achieving levels on knowledge processing

Source of variance	M.	high	average	low
high	3.98		0.12*	0.16*
average	3.87			0.04
low	3.78			

* significant at ($\alpha=0.05$)

DISCUSSION

In general results revealed a high level of metacomprehension among the participants, overall mean scored (3.35), this result may be due to the participants ability to vary reading, and interact with the read material, distinguish between professional reading for scientific reasons and reading for entertainment and passing time all of which increases metacomprehension.

Teachers pursue to develop thinking skills among the students in order to reach self-directed learning stage so students are better prepared for future is apparent through, assigning reports and scientific research for example, periodic library visits for books and journals, internet and other sources that increase students perception and ability, this may contribute in transfer from comprehension into metacomprehension stage. As for metacomprehension dimensions "knowledge organization" scored high ($M=3.76$), followed by knowledge of knowledge ($M=3.43$) last came knowledge processing ($M=3.40$) and all scores were high and close around overall mean, this may be due to learners judging certain standards to master educational material through organization and control to master learning.

In other words if the learner is able to recognize well-learned from less-learned material he might be able to compensate the difference by allocating more study time to the less-learned material, and allocating less time to the well-learned material. Accordingly, effective organization of study leading to knowledge of knowledge and knowledge processing is assumed to bring better learning and hence an increase in metacomprehension level. With respect to gender effect on metacomprehension level, the results proved that there were significant differences in favor of females. This result may be explained by females superiority in planning, organization, decision making, favoring between alternatives, ability to assess and judging, this may be the result of eastern society culture that doesn't allow a female to go out and practice hobbies and activities out-side home compared with males, this urges her to work hard to maintain this gain (i.e. going to the university) which is considered an opportunity to prove herself.

This result agrees with the results of Kolic-Vehovec and Bajanski (2006);Bukaiei (2010); and Al-Gharaibeh and Al-Zahrani (2014). In terms of academic achievement, results proved an effect of high academic achievement on metacomprehension, this may be explained by the fact that high achievers are categorized as talented, that means they are devoted on their work properly and as fast as possible. They have a unique ability to endure and perseverance, struggle to achieve their goals because of their high level of ambition, perseverance and characteristic of willingness of knowing,

they are also more able of self-assessment and self-management in planning, organization, assessment or reviewing. High achievers are characterized by their ability to manage the time allocated for studying, organizing studying and topics based on importance, ability to organize efforts exhausted in studying and willingness to excel and gain high marks. They also have the ability to question importance of strategies used, when and why they use a certain strategy not another. They are more intentional in using strategies in performing tasks, these characteristics are considered essential dimensions of metacomprehension. This result agrees with Rawson, Dunlosky and Thiede (2000); Long (1985) that revealed the increase in academic achievement increased metacomprehension skills awareness. Concerning the second part of the second question about gender effects on knowledge organization and knowledge processing it was found that females scored higher than males, this may be attributed to females characteristics such as: patience, mediation and rationality which makes them outperform males. Community culture contribute significantly in determining females confronting problems, we live in a community that doesn't allow her to mistake and she is demanded to commit to community customs and traditions totally, and if she passes them through she will be subjected to strict accountability more than males. She is brought up on this, so when faced by a certain problem she plans carefully to solve it, controls solution steps, continuously evaluates the process till the end in order to avoid society accountability, as a result her psychology is built on caution, prudence and rationality all of which is reflected on her metacomprehension level.

Knowledge organization had an effect on academic major in favor of the literary majors. This result may be attributed to the nature of literary courses ; where discussions, debates, write to review, alternative choice, decision making and organizing ideas increases students awareness compared with scientific courses rigid nature, limited alternatives, and proved facts that does not accept debate or controversy. Academic achievement influenced knowledge organization, knowledge of knowledge and knowledge processing in favor of high achievers. This result is attributed to the characteristics of high achievers of successful planning, knowledge about the task in front of them, employing this knowledge through using right strategies and when to use them and when to choose another, through using self-continuous feedback from the beginning until reaching certain goals, to evaluate the development of the process through using a number of skills: planning, organizing, assessing, decision making and controlling.

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