Metacognitive Skills among Left-Handed Students in Al-Quds University

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ABSTRACT

The aim of this study was to reveal the metacognitive skills among left-handed students at Al-Quds University. The study population consisted of all left-handed students at Al-Quds University. Data obtained from a purposive sample of 47 left-handed male and female students was analyzed using Statistical Package for Social Sciences (SPSS). The findings showed that left-handed students at Al-Quds University had a low degree of metacognitive skills. It was found that there were differences attributable to gender in favor of female students, but no differences attributable to college (Science and Humanities). The findings also revealed differences due to the overall grade point average (GPA) in favor of the students with a GPA of more than 80%. It is recommendedthat students must be taught metacognitive strategies through: helping them to plan and evaluate their learning process, stimulating their thinking processes by giving them assignments that require higher levels of thinking and challenge their mental abilities in order to obtain knowledge during the educational processes.

Keywords: *Metacognition; metacognitive Skills, Left-handed; Al-Quds University, GPA*

INTRODUCTION

Metacognitive thinking has received great attention in recent years owing to its critical role in improving the way of thinking and in raising consciousness of one's thinking and problem solving (Al-Jarrah & Obeidat, 2011). Metacognition is one of the essential theoretical concepts in contemporary cognitive Psychology. It was used for the first time inthe title of an article by John Flavell in 1976. Metacognition is concerned with how learners' perspectives about themselves as learners, i.e. their ability to plan, monitor and evaluate their own learning.

According to Flavell (1976), metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them. Metacognition refers to higher order thinking which involves active control over the cognitive processes engaged in completion of a task, such as planning activities for learning process, and monitoring and evaluating our progress to accomplish the task, that is, thinking in thinking (Costa, 1991).

This type of thinking, metacognitive thinking, is considered one of the highest levels of thinking, as one is required to constantly exercise planning, monitoring, evaluation and thinking processes.It is also a form of thinking that relates to the way theindividuals monitor themselves and how they think, i.e. thinking in thinking (Al-Atoum, 2004).

Metacognitive skills enable university students to enhance their metacognitive thinking capacities, thinking skills, reflective thinking skills intended for problem solving, decision-making skills, and alternative evaluation skills (Coşkun, 2018).They also help students focus on information relevant to a task in order to fully understand and effectively carry out the task,in other words, they help in improving students' skills required to understand how to perform a task, solve a problem or answer a question (Vorhölter, 2018). Thamraksa (2004) concluded that metacognitive strategiesof planning, monitoring, and evaluationare a key to success for EFL students, especially for those who are considered less proficient learners.She believed that metacognition is not inherited, but it can be instilled into students through direct methods. Students who possess good metacognition know how to learn and what to

do in any learning circumstances (Thamraksa, 2004).

With regard to handedness, some researchers believe that the preference for using one hand over the other is determined by cerebral hemispheric dominance. It is suggested that the left cerebral hemisphere is primarily dominant over the right side of the body in most right-handed humans (85-90%). However, the right cerebral hemisphere of the brain primarily controls the left side of the body in people who use their left hands (10-15%) (Springer & Deutsch, 1998). The dominance of one side of the human brain over the other can suggest the form that learners adopt in the process of learning and thinking (Nofal& Abu Awwad, 2008).

Nevertheless, a study by Corey et al. (2001) holded that most humans prefer to use one hand over the other, depending on the nature of the task and the extent to which it is related to the cerebral hemisphere, Alexandru et al.(2012) indicated that handedness is influenced by both genetic and environmental factors.Starosta (2004) pointed out that human movements are adapted to the preferred hand, and that effective performance is transferred or transformed from one limb to another.

RELATED LITERATURE

A study conducted by As-Salmi (2019) about systemic intelligence strategies and metacognitive thinking among students in Saudi universities found that there were no statistically significant differences due to gender or specialization.

An-Naddawi (2019) in his study about the effect of Koscroff Model on acquiring historical concepts and developing metacognitive thinking among university students indicated that the experimental group achieved better results than the control group in acquiring historical concepts and developing metacognitive thinking.

Abu Latifa (2015) found a medium level of metacognitive thinking among the students of the Faculty of Education at Al-Baha University in the Kingdom of Saudi Arabia, but there no differences were attributed to the academic year or to the academic achievement.

Ben Masoud & Ben Zarrouk (2016) showed that the left pattern was the most preferred among the participants in study sample, followed by the

right pattern, and finally the integrated pattern. However, Al-Qur'an and Al-Hammouri (2013) showed that the integrated pattern was the dominant one among the freshmen students.

Chédru & Le Méhauté (2009) made use of Herrmann Brain Dominance Theory to identify the prevailing patterns of thinking among a sample of engineering students; the results showed the dominance of the left brain. But Oflaz (2011) showed that the right brain dominates the left brain, and that the dominant pattern had an effect onstudents' academic achievement.

Abdul-Kawi, in his study (2004), sought to identify the differences in cognitive functions among Faculty students in the light of gender, academic major and handedness; the results of his study indicated statistically significant differences in most cognitive functions due to gender in favor of males and academic major infavor of practical specialties. The results also showed differences in cognitive functions due to patterns of handedness.

In their article, Froehlich et al. (2002) stressed the importance of using whole-brain thinking in practicing the leadership. They discussed new directions for improving leadership training programs for prospective school administrators in terms of their cerebral hemispheric preferences. The results showed that the left hemisphere was more preferred than the right one. However, the majority of the subjects equally preferred both the left and the right hemispheres.

RESEARCH QUESTIONS

The study sought to answer the following questions:

1) What is the level of metacognitive skills among left-handed students in Al-Quds University?

2) Are there statistically significant differences in the mean scores of metacognitive skills among Al-Quds University left-handed students due to gender, Faculty and overall GPA?

TERMONOLOGY

The term *metacognition* literally means cognition about cognition, or more informally, thinking about thinking and tacit or hidden knowledge. It is also defined as the control of cognition and knowledge about cognition (Flavell, 1976; Al-Khattab, 2007).According to

Kizlik (2009), *metacognition* refers to awareness and control of one's thinking, including commitment, attitudes, and attention. Anderson (2002) defined *metacognition* as thinking about thinking whereas Ebeid (2004) defined *metacognition*as reflections about cognition or simply thinking about thinking and thinking about how to think.

METHODOLOGY

Approach

To achieve its objectives, thisstudy used the *descriptive approach* to describe the characteristics of the phenomenon under study, andto collect quantifiable information from the obtained from the population sample to be used for the statistical analysis.

POPULATION AND SAMPLING

The population of the study consisted of all left-handed students at Al-Quds University. Apurposive sample of 47 male and female students, male (29.8%) and female (70.2%), enrolled in the academic year 2019 was selected. (38.3%) of thestudents were in the Faculty of science and (61.7%) of them were in the Faculty of Humanities. Whereas (25.5%) of left-handed students werewith GPA less than (70%), and (44.7%) of them with GPA between (70-79%), but (29.8%) of them were from those who had GPA more than (80%). Table (1) shows the distribution and percentages of students.

Table1. *Distribution of the participants in the sample of the study*

Variable	Level	n	Percentage
Gender	Male	14	29.8
	Female	33	70.2
Faculty	Science	18	38.3
	Humanities	29	61.7
GPA	> 70%	12	25.5
	%(79-70)	21	44.7
	≤ 80%	14	29.8

INSTRUMENTATION

Having reviewed related literature and the instruments adopted in a number of previous studies, the study used an accredited Arabic version (Al-Jarrah & Obeidat, 2011) of the Metacognitive Assessment Inventory (MAI) as *a measure of metacognitive skills* (Schraw & Dennison: 1994). The scale consisted of 42 items, classified under three major topics: organization of cognition, cognition of cognition, and treatment of cognition. A five-point Likert scale was used to measure the responses, and based on the appropriate statistical procedures; the scores were classified into three levels: high, moderate, and low.

INSTRUMENT VALIDITY

The instrument was validated and examined by a group of experts who provided feedback on the items of the instrument in terms of language clarity, integrity and the extent to which the items cover the topic under study; they were also asked to add any necessary information and make any amendments as required. Based on their feedback, the questionnaire was modified and finalized. The instrument validity was also checked by calculating Pearson correlation coefficient for the items of the questionnaire with the overall degree of the instrument.

Obviously, there was a statistical significance in all the items of the questionnaire, which demonstrated a good internal consistency within and between the items.

INSTRUMENT RELIABILITY

To verify the reliability of the questionnaire, the coefficient of the internal consistency (stability coefficient) for the study scale was calculated according to Cronbach's Alpha Formula. The overall level was (0.81), which indicated that the instrument had a reliability and consistency that meet the purposes of the study.

PROCEDURES

After the validity and consistency of the study instrument were constructed, and the study sample was determined, the instrument was applied to the subjects of the study and data was collected. The number of valid retrieved questionnaires that were subjected to statistical analysis was 47 questionnaires only, and several questionnaires were excluded because they were not complete.

DATA ANALYSIS

Having collected data and ensured their validity for analysis, the researchers calculated the means and standard deviations for each item of the questionnaire. Statistical Package for Social

Sciences (SPSS) was also used to calculate the scores of t-test, One-Way ANOVA and Cronbach's Alpha.

The findings revealed that left-handed students at Al-Quds University had a low degree of metacognitive skills.

FINDINGS AND DISCUSSION

Table2. *Means and standard deviations for the responses of theparticipants*

Field of study	Mean	SD
Cognitive organization	2.46	0.410
Cognitive knowledge	2.22	0.4110
Cognitive processing	2.24	0.470
Total	2.23	0.360

Table 2 shows that the mean of metacognitive skills for the total score was 2.23 and the standard deviation was (0.36), which indicates a low degree of metacognitive skills. This result is consistent with a study byAn-Naddawi (2019) in favor of the experimental group. However, this finding differs with the result of Abu Latifa's study (2015). The researchers attribute this difference to the traditional teaching methods which are still used at Al-Quds University. In fact, the majority of educators herestill fill students' minds with non-viable information that they memorize and then forget after exams.Such methods do not really encourage students to use metacognitive skills in learning, thinking, planning, or evaluation.

Table3. *Scores of t- test for the gender variable*

Field	Gender	n	Mean	SD	"t" value	P value
Cognitive organization	Male	14	2.22	0.28	-2.78	0.00
	Female	33	2.56	0.41		
Cognitive knowledge	Male	14	2.00	0.22	-2.63	0.010
	Female	33	2.32	0.43		
Cognitive processing	Male	14	2.03	0.22	-2.00	0.050
	Female	33	2.33	0.52		
Total	Male	14	2.00	.21	-2.98	0.000
	Female	33	2.32	.37		

According to the descriptive results in Table 3, it is shown that left-handed female students had a higher degree of metacognitive skills than left-handed male students at Al-Quds University. Table 3 shows that there are significant differences (00.0) in metacognitive skills for the total score and all dimensions in the interest of female students. This result is inconsistent with Al-Salmi (2019) and Abdul-Kawi (2004). Al-Quds University female students seem to be more interested in education, as education constitutes for them a window for their freedom; moreover, it is considered a fundamental step to their emancipation from the hegemony of the family and the dominance of the traditions that control their destiny. Therefore, it is necessary for those female students to study hard, get a degree, find a job, and achieve their dreams through self-sufficiency and *economic independence*. This can only be achieved by learning how to plan, monitor, evaluate, and solve problems.

Table4. *Results of the "T" test for the Faculty variable of the Faculty variable.*

Field	Faculty	n	Mean	SD	"t" value	P value
Cognitive organization	Science	18	2.38	0.460	-1.115	0.270
	Humanities	29	2.51	0.370		
Cognitive knowledge	Science	18	2.23	0.330	0.0360	0.970
	Humanities	29	2.22	.450		
Cognitive processing	Science	18	2.21	0.520	-0.359	0.720
	Humanities	29	2.26	0.440		
Total	Science	18	2.19	0.360	-0.559	0.570
	Humanities	29	2.25	0.360		

The results also revealed that left-handed students at humanities and Science Faculties had an equal degree of Metacognitive skills. Table 4 shows that there are no differences in metacognitive skills among left-handed students due to the Faculty variable at Al-Quds University. The significance level reached 57.0, which is a little larger than α≤0.05. This result is inconsistent with Abdul-Kawi (2004). This result may be attributed to one or more of the

following factors: the traditional teaching methods used by all faculty members regardless of the Faculty they belong to, the possibility that students had not received traininon thinking and problem-solving skills and the prevalence of

metaphysical thinking among the subjects, which involvestheir reliance on ready-made solutions rather than using scientific methods to work out such problems.

Table5. *Results of One-way ANOVA analysis due toGPA variable*

Field	GPA	n	Mean	SD	F	P value
Cognitive organization	> 70%	12	2.24	0.310	6.743	0.000
	(79-70) %	21	2.39	0.370		
	≤ 80%	14	2.75	0.400		
Cognitive knowledge	> 70%	12	1.93	0.270	9.542	0.000
	(79-70) %	21	2.19	0.320		
	≤ 80%	14	2.52	0.430		
Cognitive processing	> 70%	12	2.00	0.320	9.200	0.000
	(79-70) %	21	2.12	0.390		
	≤ 80%	14	2.62	0.470		
Total	> 70%	12	1.99	0.280	10.580	0.000
	(79-70) %	21	2.17	0.300		
	≤ 80%	14	2.52	0.320		

The findings also indicated that left-handed students with an overall GPA of more than 80% have a higher degree of metacognitive skills. Table 5 shows that p-value for the overall score (10.58) at significance level (0.00) is greater than ($\alpha \leq 0.05$). This means that there are differences in metacognitive skills among Al-Quds University left-handed students due to the GPA in favor of the students with an overall GPA of more than 80%. This result is inconsistent with Abu Latifa (2015). This is attributed to the fact that these students are more able to use metacognitive skills. In addition, they are more able to plan, follow-up, monitor and think about their thinking. As well as they are more able to evaluate their thinking and thus make use of the knowledge that they gain through solving their daily problems. In fact the majorityof studies have found a positive correlation between achievement and metacognitive skills.

CONCLUSION

Based on the findings of this study, it is concluded that the percentage of left-handed students at Al-Quds University students is lower than it in other communities, *as indicated by the findings of previous studies.* Moreover, Left-handed students at Al-Quds University have a low degree of metacognitive skills. Compared to left-handed male students, left-handed female students have a higher degree of metacognitive skills. Left-handed students at Humanities Faculty and Science Faculty havean equal degree of Metacognitive skills. Left-handed students with an overall GPA of more than 80% have a higher degree of metacognitive skills,

compared to their peers with an overall GPA of less than 80%.

RECOMMENDATIONS

Based on the above findings and discussion, the study recommends the following actions:

- Teaching students Metacognitive strategies through various ways. Students can be engaged inthe planning and evaluating learning process. Their thinking processes can be stimulated by giving them assignments that require higher levels of thinking in addition to challenge their mental abilities in order to obtain knowledge during the teaching-learning processes.

- Conducting further studies to identify students' need for metacognitive strategies in the field of education as there is an obvious scarcity of such studies in the Arab World. Such studies should seek to reveal the most prominent factors that affect the level of students' need for metacognition, since the current study does not aim to reveal such factors.

- Developing measures that help to reveal the actual level of metacognitive skills among students instead of merely depending on the respondents' self-assessment.

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