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Memory Self-efficacy in University Students

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Abstract

The current research aims at exploring

1. Memory self-efficacy of university students.
2. Statistically significant differences in memory self-efficacy according to gender (male, female) and specialization (scientific, humanity).

To achieve these objectives, the researcher has adopted a memory self-efficacy scale, which consists of (17) items, and it is exposed to a group of experts to judge the validity of its items. However, the psychometric properties of the scale have been ascertained by administering the scale to the research sample that consists of (400) male and female students from the University of Wasit according to the variables of gender, specialization, they are selected by using the stratified random method. The researcher has ascertained the reliability of the scale by using two ways: re-test where the reliability coefficient is (0.74), and by using the Alphcronbach equation, where the reliabilihy is (0.76). However, the researcher has arrived at the following results:

1. University students enjoy self-efficacy of memory.
2. There are no statistically significant differences in memory self-efficacy according to (gender, specialization) in university students.

In light of the aforementioned results, the researcher has developed a number of conclusions, recommendations and suggestions.

Keywords: self-efficacy; students; Iraq

Chapter One

Research problem

The researcher notices, through her presence in the social environment of the students of the undergraduate studies, many situations in which the students seeme surprised when obtaining the results of the tests, where they are different from their expectations. Some students have false beliefs about their memory, or the cognitive processes involved in remembering something.

An individual must try to change the unsuccessful traditional methods of memorizing and storing information in memory, which results in negative consequences accompanied by a decrease in the level of memory as well as a low academic achievement. Verhey points out (Verhey, 2005) that 90% of university students in Texas suffer from a decrease in the level of memory efficiency, and 55% of them suffer from a decrease in academic achievement as a result of the use of traditional methods of storing information in memory, a case which causes a decrease in the level of self-efficacy of memory (Verhey,2005:22-50).

The study of Matlin (Matlin: 2000) emphasizes that the levels of low self-efficacy of

memory gradually escalate when individuals are ignorant of modern methods and methods related to how to store and retrieve information from memory efficiently. These problems may become more complicated when ignoring and not using the modern mechanisms of storing and retrieving in case of encountering a huge amount of information in the cognitive system. (Matlin, 2000:88)

Research importance

Cognitive processes in general and memory processes in particular are regarded as an essential aspect of students to do all the behavioral activities that aim primarily to purposeful learning, in order to adapt to the surrounding environment, especially the learning environment. The cognitive abilities that the individual has, play a crucial role in assisting the individual in having the desired amount of learning, and then adaptation (Tauber,2011:12).

However, the matter does not stop at the limits of the individual's abilities. Rather, the competence that the individual believes in towards his abilities has an important role in the effectiveness of these capabilities and then employing them appropriately to achieve the maximum possible benefit from them. Goldsen, 2015:65).

However, the efficiency of memory determines the level of human cognitive activity. If the efficiency depends in a large part on what the individual possesses of the actual ability, so the individual's belief about his abilities adds a lot to the effectiveness of the ability and work to employ it in the best way. (Shiu,2018:32).

Recent scientific research in the United States and Europe has shown that memory self-efficacy is one of the most important cognitive processes, as it is necessary for countless daily activities, such as: maintaining attention, following multi-step instructions, remembering information with high accuracy, efficiency, and thinking. This broad understanding of memory self-efficacy offers hope for people who have difficulty remembering information from memory in general. (Van,2003:14).

Research objectives

The current research aims at exploring

1- Self-efficacy of memory in university students.
2- The statistically significant differences in memory self-efficacy according to:
-Gender (male, female) -Specialization (scientific, humanity)

Research limitations

The current research is limited to Wasit University students of both genders (males and females), from the two specializations (scientific and humanitarian) in the academic year (2021-2022).

Terms Definition

Memory Self-Efficacy

It is defined by:
Bandura (Bandura, 1997)

"A self-evaluation system of believing in the individual's ability to use memory effectively in the field of jobs. Thus, it is possible to deal with memory self-efficacy as it is concerned with the sense of self-efficacy, which includes the individual's beliefs and perceptions of his ability to perform the necessary actions required to evoke the appropriate outputs." (Bandura, 1997:98).

Wells (2001)

"A construct associated with the individual's beliefs and perceptions of his memory abilities in general, i.e. the individual's beliefs about his memorization abilities." (Wells,2001:56)

Chapter Two

This chapter includes a presentation of the literature, theories and previous studies that dealt with the research variables and as follows:

The theoretical framework

First: Memory Self-Efficacy

The concept of self-efficacy of memory

The term memory self-efficacy is mentioned in the psychological literature for the first time by metamemory researchers, namely Herzog, Holch, and Dixon. (Hertzog, Hultch & Dixon, 1982) who referred to the self-efficacy of memory as one of the dimensions beyond memory, which investigates emotions and feelings of the individual about the abilities of his personal memory (Stephana, et al, 2011: 428). Memory self-efficacy is the individual's ability to remember more accurately and with less effort (Ran, 2014:12). While Bandura (Bandura, 1977) views memory self-efficacy as one of the constructions related to the individual's ability to perform a task (Bandura, 1977: 192 According to Wells & Espoenko, (2008), memory self-efficacy is a construction associated with the individual's perceptions and beliefs in his own ability about memory in general (Wells & Espoenko, 2008: 10). According to Bandura, memory includes beliefs about the efficiency of memory, and is related to a particular task, such as an individual's confidence in his ability to remember a specific list of vocabulary. Thus, it is related to the idea of the specific task concept. (Bandura, 1989: 699). The specific scope of the stability of the individual's sense or awareness of the efficiency of his memory through his practicing of experiences depends on the following determinants:

1. His preconceived notion about his potentials, capabilities and information.
2. The individual's awareness of the difficulty of the task, problem or situation.
3. Self-active, goal-directed effort.
4. The size or amount of information available.
5. Circumstances under which performance or achievement takes place.
6. Previous direct experiences of success and failure.
7. The method of constructing experience or awareness of it and reconstructing it in memory.
8. The existing structures of subjective knowledge and skill and the characteristics that distinguish them.

(Gan,2015:55)

Berry & Best (1993) emphasize that memory self-efficacy does not represent a general self-evaluation, but it is related to specific task demands and the characteristics of a situation as well as its previous association with memory performance, and that memory self-efficacy according to this view has a direct effect on the current performance of memory. (Berry & West, 1993:26), because memory self-efficacy affects performance through its impact on motivation, where high levels of memory self-efficacy must be translated into higher degrees of effort and perseverance in facing the the cognitive challenges related to memory. However, that effort and perseverance must lead to maximum performance levels (Sanders, 2005).

Zimmerman & Cleary (2006) assert that the individual's belief in his ability to perform a task will increase his effort, concentration and absorption with the task, while possessing the necessary ability and knowledge by the individual does not necessarily mean that the individual has the ability to perform the task that requires from him to use the memory unless the individual has the sufficient beliefs about the efficiency of his memory in its performance (Zimmerman & Cleary, 2006: 266). A number of studies, such as Cavanaugh & Poom, 1989, and McDonald- Miszczak, et al, 1999, have found important correlations between memory self-efficacy and memory performance. (Wells, 2001: 9)

Bandura (1994) indicates that the self-efficacy of memory has several factors that have an effective impact on the behavior of the individual, they are as follows:

1- Selection of activities: (Choice)

A person chooses the activity that he performs successfully because success leads to higher self-efficacy in memory and avoids the activity that leads to failure. Students choose activities that they can successfully adapt to and avoid activities that exceed their abilities and cannot adapt to them.

2- Effort & Persistence

The individual who enjoys a high level of self-efficacy of memory, does not exert a high effort in the face of difficulties and obstacles, as he achieves a high level of academic achievement and does work with enthusiasm and success in the task.

3- Learning & Achievement

The individual who develops high self-efficacy in memory, this would help him to achieve higher learning degrees as well as a high degree of achievement. His competence helps him to generate actual self-satisfied abilities to achieve learning and achievement.

4- Thinking and Decision Making

Individuals who blieve in their self-efficacy of memory in solving problems have the ability to think and make decisions when completing complex tasks. In contrast with individuals who have doubt and mistrust in their self-efficacy of memory. When solving problems, their thinking pattern is superficial, and they do not have the ability to make the appropriate decision when facing problems and their thinking is low when performing work.

5- Emotional reactions

Individuals who have high self-efficacy in memory focus their thinking on the requirements and challenges of the task and respond to the challenges of the task or activity with high enthusiastic and optimistic performance. In contrast, people who suffer from feeling of absence of self-efficacy memory, feel anxious, frustrated, anticipating failure, feeling inferior, pessimistic, and not performing tasks or activities (Bandura,1994:115-116).

Self-efficacy theory

The concept of self-efficacy appeared in the first time by Bandura in 1997 (Bandura, 1997) when he published an article entitled "Self-efficacy towards a theory of behavior modification". In this article, he emphasized the importance of self-efficacy as a key factor in modifying behavior and as an indicator of an individual's expectations about his ability to overcome various tasks and perform them successfully. (Bandura, 1997: 90-92)

According to Bandura's theory of self-efficacy, memory self-efficacy refers to the individual's belief in his ability to organize and implement the required courses of action in the areas of memory, a case which results in certain achievements (Bandura 1997: 3). Within this concept, individuals are active contributors, and are not only limited or recipients to what actually happens in reality. They act on their own environment, meditate and work on themselves. Memory self-efficacy is the individual's sense of competence and confidence in a particular task and in a particular field related to memory. It is not a static entity, but rather it is dynamic, flexible, and subject to the changes of the requirements of a task, situation determinants, social context and individual development (Berry & West, 1993: 353).

Bandura (1997) notes that the beliefs of self -efficacy of memory affect the performance of memory during the symptoms of perseverance and effort, as it is believed that the individuals who have a strong sense of self -efficiency of memory look at the difficult tasks in the memory as challenges that must be controlled instead of being threats that must be avoided (Bandura, 1997:90), and that those with high levels of memory self-efficacy will try harder and persist longer on such tasks. Although Bandura, uses the terms effort and persistence interchangeably, Berry & West, 1993 refers to the fact that persistence and effort are different, and they may contribute differently in performance. persistence means the time taken in doing a task or the number of elements that the individual try to complete while effort refers to the mental effort or using the various cognitive strategies that are directed towards mastering the memory task, since mental effort may not be sustained, and persistence may not necessarily require much effort, the existence of one of them does not require the existence of the other (Wells, 2008 5).

Bandura (1997) argues that memory self-efficacy beliefs are related to subsequent behavior or performance even after controlling for prior performance, and that the relationship between memory self-efficacy and performance is mediated by a number of various processes which may be cognitive, motivational or emotional or selectional. (Bandura, 1997: 210)

Justifications for adopting Bandura's theory of self-efficacy

The researcher adopted Bandura's theory as an interpretation theory of memory self-efficacy in the current research, for the following justifications:

1. It represents the basic theory that dealt with the concept of self-efficacy, from which the concept of memory self-efficacy is derived.
2. This theory agrees with the definition of memory self-efficacy adopted in the current research, which is Bandura's definition (Bandura, 1997).
3. This theory agrees with Wells' memory self-efficacy scale (Wells, 2001), which is constructed according to Bandura's theory.

Studies dealing with memory self-efficacy (*1)

Gardiner et al, 1997 study

"***The Manipulation and Measurement of Task-specific Memory Self-Efcacy in Younger and Older Adults"***

Objective: The study aims at finding out the differences between young and old in memory self-efficacy.

Sample: The research sample consists of (56) university students and (56) elderly people, their ages ranged between (63-86).

Tools: The tool used for measuring memory self-efficacy is Wells Scale (2001), which

consists of (17) items and (5) response options, in addition to Berry et al, 1989's manipulation scale that consists of (11) items with (7) responding options.

Results: The study shows that there are statistically significant differences in memory self-efficacy between young people and the elderly in favor of young people (Gardiner, et al, 1997: 209-227).

Wells Study (Wells, 2001)

"The role of memory self-efficacy in memory performance and performance estimation accuracy in adults"

Objective: This study aims at exploring the self-efficacy of memory and its relationship to performance in the Department of Adult Education at the University of Southern California in the United States of America.

Sample: The research sample consists of (95) respondents whose ages ranged between (18-90) years.

Tools: The study uses a measure of self-efficacy of memory, constructed by the researcher, consisting of (17) items and (5) options, and a scale of the accuracy of performance evaluation, that consists of (30) items and (5) reponding options.

Results: The study finds a positive and statistically significant relationship between memory self-efficacy and performance. The study also finds significant differences between youth and the elderly in memory self-efficacy in favor of youth (Wells, 2001: iv-v).

Chapter Three

Research Methodology and Procedures

First: Research method

The researcher has relied on the correlative descriptive approach that depends on the study of the phenomenon as it exists in reality and concerned with describing it numerically through quantitative expression that shows the amount and size of the phenomenon or qualitative expression that explains the characteristics of the phenomenon. (Al-Obaisi et al., 2014: 74)

Second: The Research Population

The research community means that all individuals or elements that share one or more characteristics that distinguish it from the rest of the communities, where the researcher is interested in studying it and generalizing the research results to it. (Al-Jabri, 3013: 178)

The current research community (*[2]) consists of university students at University of Wasit, in the academic year (2021-2022), the two majors (scientific and humanities), and of both genders (males and females), where their number is (16590) male and female students divided into (4) humanitarian colleges with (6815) male and female students (0.41%), and (11) scientific colleges with (9775) male and female students (0.59%), where the total number of males is (8107), (0.49%) and the total number of females is (8483), with a percentage of (0.51%). Table (1) shows the members of the community distributed by colleges, specialization and gender.

Table (1) *Numbers of Wasit University students according to colleges, specialization and gender (research community)*

colleges	Class 1		Class 2		Class 3		Class 4		Class 5		Class 6		gender		specialization		total
	m	f	m	f	m	f	m	f	m	f	m	f	m	f	scientific	humanity	
	scientific colleges																
sport education	186	49	77	36	123	47	104	32					490	164	654		654
sciences	306	325	123	173	121	170	87	135					637	803	440		440
management and economy	369	363	399	309	389	264	350	191					1,507	1,127	2,634		2,634
Education for pure sciences	163	221	188	151	124	116	92	122					567	610	1,177		1,177
computer and information technology	83	86	35	62	67	79	92	74					247	301	548		548
Agriculture	51	55	61	56	51	32	71	86					234	239	473		473
fine arts	25	101	28	54	32	78	37	78					122	341	453		453
engineering	233	137	164	89	81	61	52	51	2	16			552	354	906		906
dentistry	55	142	46	67	22	60	25	52	34	61			182	182	564		564
medicine	68	156	79	106	28	77	33	60	44	77	29	40	281	516	797		797
Veterinary Medicine	24	34	10	13	23	19	12	11	3				72	77	149		149
total	1563	1.669	1.210	1.116	1.061	1.003	955	892	83	154	29	40	4,904	48,74	9775		9775
	humanitarian colleges																
law	112	84	63	64	101	94	100	89					376	331		707	707
arts	61	86	84	109	97	156	84	111					326	426		788	788
basic education	228	258	236	163	111	176	117	145					592	742		1334	1334
human science education	830	848	428	512	283	357	271	357					1,813	2,074		3,667	3,667
total	1231	1276	811	848	592	783	572	702					3,206	3,609		6815	6815
total sum																	16590

Third: Research sample

The sample is defined as a model that includes an aspect or part of the units of the original community that is concerned with studying and it is similar to it because it bears its common characteristics. However, that model, or the part, enriches the researcher to study all the units of the original community and its members. (Al-Jabri, 2013: 178)

The sample is chosen by using the stratified random method, and it consists of (400) male and female students from the university, with a percentage of (2.41%) of the total community, (125) male and female students distributed among the scientific colleges, (31.25%) and (275) male and female students distributed among humanitarian colleges with a percentage of (68.75%), where the number of males is (173) students with a percentage of (43.25), and the number of females is (227) students with a percentage of (56.75), as shown in table (2), which presents the details of the research sample distributed according to gender and specialization.

Table (2) *Research sample according to gender (males - females) and specialization (humanitarian - scientific)*

College	specialization	gender		total
		male	female	
Sciences	scientific	5	9	14
Engineering	scientific	4	20	24
Medicine	scientific	6	7	13
Management and Economy	scientific	9	16	25
Education and pure sciences	scientific	7	8	15
Computer and information technology	scientific	3	10	13
Agriculture	scientific	8	13	21
total number of scientific colleges		42	83	125
Education of human sciences	humanitarian	58	50	108
Basic education	humanitarian	8	11	19
Law	humanitarian	40	33	73
Arts	humanitarian	25	50	75
total number of humanitarian colleges		131	144	275
total number of the sample		173	227	400

Fourth: The Research Tools

The research tool is defined as the method by which you measure a trait or phenomenon, or it is a standardized method for measuring a sample of behavior. (Abu Jadu, 2014: 398)

For the purpose of achieving the objectives of the research, it is necessary to have a scale in line with the current research and the nature of the research community and must have the psychometric properties, so the researcher adopted the memory self-efficacy scale prepared by (Wells, 2001). However, the scale is administered with the presence of students, and then data is collected by using (Microsoft Excel) program.

The first scale: a scale for measuring memory self-efficacy:

After reviewing the literature and studies related to the subject of the research, the researcher adopted the scale of (Wells, 2001) for measuring self-efficacy of memory, which consists of (17) items and includes (5) responding options where the response weights are (1,2,3,4,5), for the positive items and (5,4,3,2,1) for the negative items. The negative items of the scale are (7,4), see appendix (2).

Finding the validity of the items of the scale (face validity)

Eble (Eble, 1972) mentions that the best way to ascertain the validity of the items is to expose them to a number of specialized experts to decide their validity to measure the quality for which they are constructed (Eble, 1972: 555).

To verify the face validity of the memory self-efficacy scale, and its suitability to the Iraqi environment, the researcher exposed the scale in its initial form, see appendix (3), to (20) specialized experts in educational and psychological sciences, see appendix (6). Based on the opinions of the experts, the scale is accepted without making any modifications, where the agreement of all experts has been obtained with a percentage of (100%).

Clarity of instructions and items sample (pilot sample)

In order to verify the extent of the sample members' understanding of the scale's items and its instructions, to identify the clarity of the scale's instructions besides the clarity of its

clauses and responding options, and to calculate the time taken to answer it, as well as to identify the difficulties facing the respondent, the researcher has conducted an exploratory experiment and administered the memory self-efficacy scale on (30) male and female students. They are randomly selected where the researcher assured them that their responses are for the purposes of scientific research, so they are not asked to mention the name in order to reduce the impact of the social desirability factor. After reviewing the students' responses on the scale items, it becomes clear that all the items are clear, easy to answer and understandable, while the time taken to answer the scale ranged between (8-13) minutes, and the average answer is (10,5) minutes. Table (3) shows these details.

Table (3) *Clarity sample of items and instructions for the memory self-efficacy scale according to college, gender, and specialization*

College	Department	specialization	male	female	Total
Engineering	Civil	Scientific	4	4	8
Agriculture	Soil and water sciences	Scientific	3	3	6
Education	Geography	Humanity	5	6	11
Arts	Philosophy	Humanity	3	2	5
	Total		15	15	30

Statistical analysis of memory self-efficacy scale items

The process of the statistical analysis of psychological scales items is one of the important and necessary steps in its construction. Because it reveals the psychometric properties of its items, which makes the scale more valid and reliable, because the accuracy of the scale in measuring what is set for depending on the accuracy of its items. The goal of this procedure in analyzing the items is to keep the discriminated items and delete and exclude the undiscriminated items, by calculating the discriminatory power of each the item with the aim of excluding items that are not discriminated between respondents and maintaining the items that are discriminated (Al-Imam et al., 1990: 114). If the item has a discrimination power, this means it has the ability to discriminate among respondents with low scores and those with high scores in this concept that the items measures. Anastasi, 1982: 194)).

Discrimination Power of Items

In order to identify the discriminatory power of the items, the researcher has adopted two methods:

The first method: the method of the two extreme groups

The researcher verified the items of the memory self-efficacy scale by administering the items of the scale on the statistical analysis sample which is (400) male and female students, by using the method of the two extreme groups. After correcting the responses, the following steps are followed:

1. Determining the total score of each form.
2. Sorting scores in descending order from highest to lowest.
3. Determining the two extreme groups by the degree of (27%) as a higher group, and (27%) as a lower group, where the number of members of the upper group is (108), and the lower group is (108), the total number is (216) individuals.
4. The researcher has used t-test of two independent samples to test the significance of the differences between the average scores of the upper and lower groups, by comparing the calculated t-value of each item with the tabulated t-value of (1.96) with degree of

freedom (214). Through this procedure, it is found that all items have discriminatory power because they are statistically significant at the level of significance (0.05), where the calculated T-value is greater than the tabulated T-value of all items of the scale. Table (4) shows the results of calculating the discriminatory power of the items of the memory self-efficacy scale.

Table (4) Discriminative power of memory self-efficacy scale items

s Item	upper group arithmetic mean	upper group standard deviation	lower group calculated mean	lower group standard deviation	calculated t-value	level of significance (0,05)
1	4.4352	0.83468	3.2963	1.08739	8.634	
2	4.0000	1.0680	2.8796	1.09985	7.595	
3	4.1019	0.99475	3.1019	1.04961	7.186	
4	3.6019	1.15151	3.2500	1.05126	2.345	
5	4.0278	0.96149	2.7037	0.98834	9.979	
6	4.2870	0.95752	3.2222	0.96995	8.119	
7	2.6389	1.35659	2.2778	0.86287	2.334	
8	4.6667	0.59594	3.9074	0.87046	7.480	
9	4.1386	0.90128	2.5000	1.00000	12.652	significant
10	4.0926	0.77985	2.7222	0.93562	11.692	
11	3.9074	0.82640	2.3426	0.99684	12.559	
12	4.1759	0.86282	2.7037	1.09595	10.969	
13	3.7593	0.97511	2.2407	1.00346	11.278	
14	4.0463	0.84703	2.8241	0.95535	9.948	
15	4.0370	0.74791	2.6667	1.08516	10.806	
16	4.0556	0.82974	2.8981	1.07599	8.852	
17	4.2407	0.90554	2.7963	0.96441	11.347	

The second method: the relationship of the item degree to the total degree (internal consistency)

validity in the psychological scales items is of great importance, because the scale's validity depends mainly on the validity of its items. In this respect, Abu El-Nile (Abu El-Nile, 1987) indicates that the experimental validity of the items is necessary to reveal the accuracy of the items in measuring what they are developed for. (Ahmed, 1981: 122)

The method of correlating the degree of the items with the total degree of the scale is one of the methods used to calculate the internal consistency of the items, meaning that each one of the items goes in the direction in which the scale goes, and one of its advantages is to provide a homogeneous scale. (Smith, 1966, 70)

Anastasi (Anastasi, 1976) indicates that the correlation of the item with an internal or external criterion is an indicator of its validity. when there is no external criterion, the total degree of the scale represents the best internal criterion. To attain this, the value of the correlation coefficient between the item and the total score of the scale has been calculated by using Pearson correlation coefficient. Table (5) shows these details.

Table (5) *Correlation coefficients between the score of each item and the total score of the memory self-efficacy scale*

Item no.	correlation coefficient of the item with total score	item no.	correlation coefficient of the item with total score
1	0,460	10	0,578
2	0,467	11	0,595
3	0,410	12	0,490
4	0,200	13	0,567
5	0,522	14	0,493
6	0,396	15	0,535
7	0,208	16	0,444
8	0,376	17	0,515
9	0,540		

It is clear from the table that all correlation coefficients are statistically significant when compared with the tabulated value of the correlation coefficient of (0.098) at a significance level (0.05) and a degree of freedom (398). However, this is an indication that the scale is valid, that is, all items are significant in measuring the phenomenon that is designed to measure it.

Calculation of the psychometric properties of the memory self-efficacy scale

The psychometric characteristics of the scale's items are of great importance in determining its ability to measure what it is actually set to measure and ascertaining the psychometric characteristics of educational and psychological scales is one of the basic tasks, because it indicates the quality of the scale. (Anastasi,1988: 105)

The researcher has ascertained the validity and reliability of the scale according to the following procedures

1- Validity

Oppenheim (Oppenheim, 1973) points out that validity indicates the measurement of the items of what they are supposed to measure, that is, the valid scale measures the function that it supposes to measure and does not measure something else instead (Oppenheim, 1973: 69-70). Nevertheless, through the scale we can verify the extent of the ability of the scale to achieve the purpose for which it is prepared. (Al-Ajili: 2001: 112)

Two indicators of validity have been ascertained in the current scale: face validity and construct validity. The following is an explanation of how to verify each of them:

Face Validity

It means the logical analysis of the content of the scale or verifying that it represents the content to be measured (Alen & Yen, 1979: 67). However, this type of validity is achieved by exposing the items of the scale to a group of (20) experts in educational and psychological sciences, to demonstrate the validity of the items in measuring what they are supposed to measure.

Constrcut Validity

The validity of the construction represents the preliminary stage in the development of tests and standards. It is directed to the service of the test itself by moving from the doubt that the scale measures the characteristic that it is constructed to measure it. It also deals with the relationship between the results of scales and tests and the theoretical concept that the test aims to measure (Faraj, 1980: 315).

The researcher has ascertained the construct validity of the memory self-efficacy scale through:

Discrimination: by finding the differences between the two extreme groups.
Relationship of the item degree to the total degree.

2- Reliability

Reliability means the accuracy of the scale or its consistency, i.e. consistency in the performance of the individual and stability in the results (passer & smith 2001: 343). Another objective of ascertaining reliability is to estimate the scale errors and to suggest ways to reduce these errors (Murphy, 1998: 63). The stable scale gives us another indication of the scale's accuracy and homogeneity in measuring the characteristic (Zeller & carmines, 1980: 77).

For the purpose of achieving reliability, the researcher has drawn a simple random sample from the research community consisting of (40) male and female students who are chosen randomly, as illustrated in table (6).

Table (6) *Reliability sample according to gender and specialization*

college	specialization	gender				total
		male	female	male	female	
Education	humanity	5	5	5	5	20
Sciences	scientific	5	5	5	5	20
total		10	10	10	10	40

The researcher has adopted two methods to calculate the reliability, they are:

Test-Retest method

It means re-administering the scale twice, in two different time periods on the same group of individuals, then calculating the correlation coefficient between the scores of the first and second administration of the test (Melhem, 2002, 257).

In order to ascertain the reliability by using retest method, which refers to the coefficient of reliability over time, the researcher has administered the scale on the reliability sample that consists of (40) male and female students, with an interval of (14) days from the first administration, then analyzed the degrees of the first and second administration to have the reliability coefficient, which is (0.74). This value is a good indicator of the reliability of individuals' responses on the scale over time, as the measurement and evaluation literature indicates that the value of the reliability coefficient if it is more than (0.70) is acceptable. (Al-Esawy, 1985: 58)

Cronbach's Alpha equation

The goal of finding the reliability coefficient in this way is to ensure the consistency of the performance of individuals on the general scale, (Al-Zamili et al., 2009: 276). However, this method is based on calculating the correlations between the scores of all the items of the scale, as an item is considered as a scale in itself. (Awda, and Al-Khalili, 1988: 254). Internal consistency refers to homogeneity, meaning that the items measure one concept. (Abu Libdeh: 1979: 211), by using the Cronbach equation, the resultant alpha coefficient is (0.76), which is a good and acceptable value and indicates the homogeneity of the scale (Rabee, 1994: 98). Table (7) shows the reliability coefficient by using re-test and Alphcronbach methods.

Table (7) *Reliability coefficients of memory self-efficacy scale by using re-test and Alphcronbach methods*

correlation coefficient value	method of reliability
0,74	Re-test
0,76	Alphcronbach

Statistical indicators of memory self-efficacy scale:

Statistical indicators of the memory self-efficacy measure are ascertained by means of the Statistical Package for Social Sciences (SPSS), table (8) illustrates this.

Table (8) *The values of the statistical indicators of the memory self-efficacy scale*

statistical indicators	statistical value
arithmetic mean	57,7950
median	57,0000
mode	55,00
standard deviation	8,35059
variance	69,73
skewness	0,334
kurtosis	0,199
range	47,00
lower degree	38,00
higher degree	85,00

When observing the values of the aforementioned statistical indicators of the memory self-

efficacy scale, it appears from the above table that the degrees of memory self-efficacy are close to the normal distribution, because the mean, median, and mode degrees are close to each other, and the skew and kurtosis coefficients are close to zero. Therefore, the scale is accurate in measuring the concept. The sample is representative of the community, which allows generalizing the results of the administration of this scale. (Back, 1998: 86), as shown in figure 1.

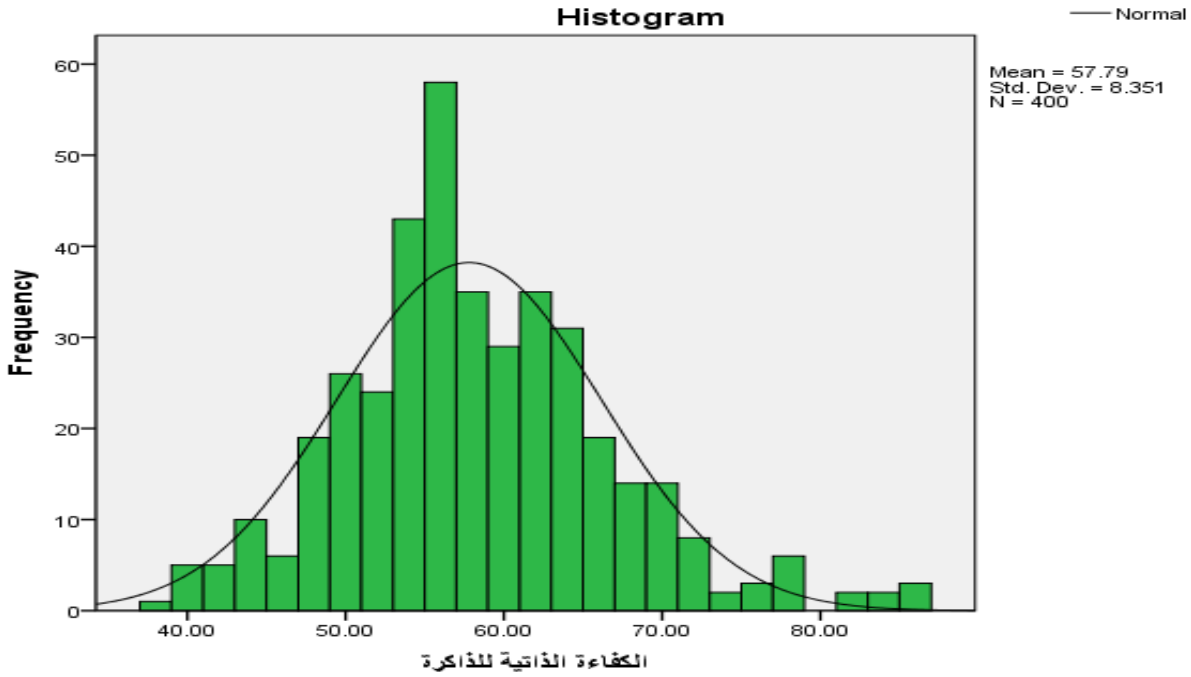

Figure (1) *Sample* analysis *graph (n = 400) of memory self-efficacy scale*

Final description of the scale

After completing the procedures for preparing the research tools, the researcher relied in extracting the research results on the research sample of (400) male and female students. Because no items is deleted from the memory self-efficacy scale in the statistical analysis procedures, the scale in its final form consists of (17) items. Each item has five responding options, which are (strongly agree, agree, neutral, disagree, strongly disagree), the range of response degrees of the scale ranged between (highest degree -85 and lowest degree 17) where the hypothetical mean is (51) degrees, and the following weights are given, respectively (1,2,3,4,5) for positive items and for negative items (5,4,3,2,1) for the purpose of correction see Appendix (6).

Chapter Four

Presentation, interpretation and discussion of the results

The first objective: to identify the self-efficacy of memory among university students

To verify this goal, the researcher has administered the memory self-efficacy scale that consisting of (17) items on the research sample that consisting of (400) male and female students. The results of the research show that the arithmetic mean of the scores of this sample on the scale is (57,795) degrees with a standard deviation of (8,350) degrees. For the purpose of knowing the significance of the difference between the arithmetic mean and the hypothetical mean, which is (51) degrees, the researcher has used the T-test for one sample. However, it is found that the difference is statistically significant, as the calculated t-value amounted to (16,274), which is greater than the tabulated t-value of (1.96), at a significance level (0.05), and at a degree of freedom (399), which means that the research sample possesses self-efficacy

of memory, as illustrated in table (9)

Table (9) *The arithmetic mean, standard deviation, and the T-value of the memory self-efficacy scale*

construct	sample	arithmetic mean	standard deviation	hypothetical	T-value		significance (0,05)
					calculated	tabulated	
memory Self-efficacy	400	57,7950	8,35059	51	16,274	1,96	دالة

It is clear from table (18) that the current research sample of university students has a normal level of self-efficacy of memory, which can be described as a good level, and to explain this, the researcher attributes this result and based on the theoretical framework, which reveals that self-efficacy of memory develops with age and that experience plays a role in enhancing this ability. As a result, individuals with memory self-efficacy, are well aware of the strength and limitations of their memory and have a strong sense of self-worth, and this is consistent with Bandura's theory (Bandura, 1996) that individuals with self-efficacy of memory use modern methods of processing and retrieving information, achieve academic achievement, they have more willing to meet challenges, they are in control of events that affect their lives, and are realistic in their own expectations. This is due to the maturity and experience they have gained through various experiences (Bandura, 1996:11).

The result of this study is in agreement with the study of (wells, 2001), which indicates that university students are more conscious and aware of the efficiency of their memory and has more ability to organize nformation in memory. They focus on how to store information in memory instead of focusing on storing it only (Wells, 2001: 23).

It also agreed with the study of (Kraemer, 2020) that students who enjoy self-efficacy in memory achieve high cognitive achievements and are relatively unaffected by failure, have the ability to persevere, have an internal control point, and see the requirements of the stressful environment as a challenge and opportunities for success (Kraemer, 2020: 43).

It also agreed with the study of (Gardiner, et al, 1997), which indicates that individuals enjoy self-efficacy in memory.

The second objective: to explore the statistically significant differences in the self-efficacy of memory in university students according to gender (male, female) and specialization (scientific, human).

For the purpose of verifying this goal, the researcher has collected the responses of the research sample, (400) male and female students on the memory self-efficacy scale, as shown in table (10)

Table (10) Arithmetic mean and standard deviation of memory self-efficacy scale according to (gender, specialization)

Standard deviation

standard deviation	mean	number	specialization	gender
9,635	59,952	42	scientific	
6,908	56,229	131	humanity	males
7,794	57,133	173	total	
8,157	59,108	83	scientific	
9,044	57,833	144	humanity	females
8,734	58,299	227	total	
8,652	59,392	125	scientific	total
8,123	57,069	275	humanity	

In order to confirm the differences in memory self-efficacy according to gender and specialization, the researcher has used the two-way variance analysis test with interaction, and the results are as shown in table (11).

Table (11) *The results of two-way analysis of variance with an interaction to identify the statistically significant differences in memory self-efficacy*

Variance Source	squares sum SS	freedom degree Df	mean squares Ms	arithmetic F-value	tabulated F-value	significance level 0,05
gender	75,543	1	75,543	1,082		
specialization	6,129	1	6,129	0,088		
gender × specialization	26,137	1	26,137	0,374	3,84	not significant
error	27648,557	396	69,820			
total	27823,190	399				

The results of the two-way variance analysis show the following data:

Gender: It is found that the calculated ratio of F-value is (1,082) which is smaller than the tabulated ratio of F-value which is (3.84) at a significance level of (0.05) and two degrees of freedom (1,396), which indicates that there are no significant statistical differences in memory self-efficacy according to gender.

The researcher attributes this result, based on the theoretical framework, to the fact that memory self-efficacy are mental beliefs and concepts related to the individual's self, which, when activated in individuals of both genders, produce a good interest in the subject of memorization, remembering, and retrieval of the study material, as well as good interest in some aids and skills that help them to efficiently acquire and recall information from memory.

The results of this study agreed with the study (Kraemer, 2020), which indicates that both genders (males, females) have self-efficacy in memory and there is no difference between them, but it differed from the results of the study of (Gardiner, et al, 1997) and the study of (Wells, 2001), which indicate that there is a statistically significant difference according to gender and in favor of males.

Specialization: It is found that the calculated F-value ratio (0.088) of specialization is greater than the value of the the calculated F-value ratio (3.84) at the level of significance (0.05) and two degrees of freedom (1,396), which indicates that there are no significant statistical differences in memory self-efficacy according to specialization.

It is also clear from the table that there are no differences according to the scientific and human specialization, the researcher attributes this result relying on the theoretical framework to the fact that students who enjoy self-efficacy of memory use various remembering strategies, and innovative plans to memorize and remember information with high efficiency, depending on the nature and difficulty of the study subjects, and academic problems. Lima and others (Lima, et al, 2010) indicate that the various academic and life challenges faced by individuals require acquiring new skills, energy and high will, as well as enjoying the best strengths, which is the presence of self-efficacy in memory, which helps them to do their academic tasks with high-level of efficiency and accuracy. (Lima, et al, 2010: 115)

Gender * Specialization: It is found that the value of the calculated ratio of F-value (0.374) with interaction between (gender * specialization) is smaller than the tabulated percentage value of (3.84) at the significance level (0.05) and two degrees of freedom (1,396),

which indicates that there are no statistically significant differences depending on the interaction between gender and specialization.

Conclusions

In light of the results of this research, the researcher has arrived at the following conclusions:

1. University students enjoy self-efficacy of memory.
2. Memory self-efficacy is not affected by both gender and specialization.

Recommendations

In light of results and their discussion, the researcher has put forward a number of recommendations:

1. The necessity to highlight the role of memory self-efficacy in achieving what the university student seeks to.
2. Providing various programs to maintain the students' memory self-efficacy level towards learning, which increases their effectiveness and academic efficiency.

Suggestions

To complete the results of this research and to develop it, the researcher suggested conducting the following studies:

1. Conducting a comparative study in the self-efficacy of memory between the groups of young people and the elderly.
2. Memory self-efficacy and its relationship to the dominant cognitive power of postgraduate students.
3. Memory self-efficacy and its relationship to the cognitive speed of university teachers.

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Appendix (1)

Memory Self-efficacy Scale

Dear student

You have a set of items that express your opinion, so please read the items accurately and answer them objectively so that they really reflect how you feel about these situations.

It should be noted that there is no right or wrong respond, the correct answer is what agrees with your opinion and your actions towards the situations you are going through, so please mark your choice on the answer sheet designated by placing (✓) under the choice that you consider appropriate which expresses your point of view. Note your answer is used for scientific research purposes only and there is no need to mention your name or any other data.

An example of how to answer

s	Item	strongly agree	agree	neutral	disagree	strongly disagree
1			✓			

Thanks, and appreciation for your kind cooperation

Gender: male () female ()

Specialization: Humanitarian () Scientific ()

s	Item	strongly agree	agree	neutral	disagree	strongly disagree
1	I remember the names well.					
2	I remember birthdays well.					
3	I think I do not have a difficulty in tracking my own schedules.					
4	I find it difficult to remember general information.					
5	I am good in remembering events and their chronological order.					
6	I remember well the conversations I had done.					
7	I forget who was with me on the occasions I attended.					
8	I remember well the places I visited.					
9	I think I have no problem remembering where to put my things.					
10	I am good in remember things like recipes.					
11	I can remember the titles of books, movies and plays.					
12	I do not have a difficulty in remembering the words of lyrics					
13	I remember well the names of the anthology.					
14	After reading a book, I do not have any difficulty to remember the facts and information in it.					
15	I am good in remembering the content of articles and bulletins newsletter.					
16	I find it easy to remember the plot and narrations.					
17	I can remember accurately about a specific thing in which place I read it or hear it.					