

The Depth of Knowledge Among Postgraduate Students

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Abstract

The Current Research Aims to:

- 1- Recognizing the depth of knowledge of postgraduate students.
- 2- Identifying the differences in the depth of Knowledge levels among postgraduate students according to the variables (gender, specialization and stage).
- 3- Identifying the statistically significant differences in the correlation between the depth of knowledge according to the variable of gender (males - females), specialization (scientific - human) and the stage of study (Masters - PhD).

The research's sample (construction and application) consisted of (800) male and female students at the faculties of the University of Al-Qadisiyah, they were chosen randomly according to the Department of Post-Graduate Studies at the University of Al-Qadisiyah, with (156) males, (174) females from the master's degree, and (38) males, (32) PhD female. The researcher used a research tool, which is building a depth of knowledge scale.

The first: the depth of knowledge scale, which the researcher built according to the theory of Norman Webb (Webb, 1997).

The psychometric properties of the scale were verified from the apparent validity, construct validity and stability by the method of analysis of variance (Cronbach's alpha) and halving, where the statistical means were used (percentage, t-test for two independent samples, Pearson correlation coefficient, Spearman-Brown equation, variance, standard deviation, skewness) .

The Search Results Showed The Following:

- 1- The postgraduate students at the University of Al-Qadisiyah have a wide range of knowledge.
- 2- There are no statistically significant differences in the degrees of the depth of knowledge among postgraduate students according to gender (males, females), specialization (scientific, human), and study stage (Masters, PhD).
- 3- The postgraduate students have depth of knowledge and emotional consistency.

Keywords: postgraduate students, gender, Knowledge.

Chapter One

Research problem

When looking at the reality of teaching in the stages of public education, it is noted that the

traditional method is still the dominant method in its teaching, which focuses on the use of the lecture method and focus on memorizing scientific facts, and the lack of interest in developing thinking skills and scientific inquiry,

as well as the passivity of learners, as well as the weak interest in creating opportunities for educational situations. It raises the motivation of learners and develops the depth of their scientific knowledge, which leads to the difficulty of the scientific material and the weakness of their comprehension of it. (Mahmoud, 2020: . (1055 .)

As the development of levels of depth of knowledge among students helps them to build self-schemes correctly, and self-schemes are the most complex in the aspects of personality because they focus on the self directly, they depend on experience, present behavior and future expectations and also bear the congruence between expectations and personal goals, and some may have. People have bad plans, and it may be a method that people acquire or fail to acquire about the self, as it is related to the way individuals think about themselves in that they have a good and high self-efficacy, or vice versa.

The crystallization of the sense of self is the outcome of the interaction of the physical attributes and the psychological, mental, emotional and social characteristics of the individual, through which he reflects his behavior, self-control and making decisions as a result of his awareness and knowledge of himself (Al-Kaabi, 2020: 3)

The Research Importance:

The importance of research for the depth of knowledge among Postgraduate students is due to the achievement of meaningful learning and linking new knowledge with previous knowledge within a conceptual framework of knowledge existing in the cognitive structure of students, which leads to the production of interconnected ideas and the ability to compare, distinguish and understand contradictory ideas, as the individual who is characterized by depth of knowledge has the ability to analyze and evaluate new knowledge and link with the knowledge has in its knowledge building and put it in a conceptual framework, which leads to the formation of the so-called (depth of knowledge), retention of concepts and the development of the ability to solve problems, interpret information in depth, distinguish, compare, ask questions and apply scientific knowledge in Unfamiliar new contexts, and one of the most important reasons for students' low levels of knowledge is that there is a clear weakness in the dimensions

of deep learning, lack of interest in how students process knowledge and organize it within their cognitive structure, not encouraging them to ask questions that focus on logical explanations, not urging them to generate New ideas, not arousing curiosity towards knowing what is beyond the concept (Hussain, 2018: 134).

The development of knowledge levels of depth in the educational process is of great importance, including:

- 1- Linking new experiences, information and ideas with previous experiences, ideas and information.
- 2- The use of organizational methods and processes during learning.
- 3- Organizing educational situations so as to stimulate the student's thinking, allowing him to form his cognitive structure.
- 4- The long-term impact of learning and the consolidation of the principle of independence in learning.
- 5- Developing the problem-solving skills and decision-making to adapt to the surrounding environment.
- 6- Acquiring the skill of linking ideas together in the light of a comprehensive and integrated vision.
- 7- Develop the skills of searching for, critiquing and evaluating information and solutions.
- 8- Integration and employment of knowledge and linking it to life situations.
- 9- Develop the student's level of strategic thinking and extended thinking, which is reflected on his future thinking
- 10- Encouraging self-work by forming concepts correctly and reducing misperceptions of them (Al-Rifai, 2019: 800).

The importance of the research from the researcher's point of view:

- 1- Forming a depth of knowledge for graduate students by linking new knowledge with previous knowledge in a conceptual framework for the knowledge in their knowledge structure.
- 2- Develop the cognitive depth of postgraduate students through developing their mental abilities.

3- The importance of research for graduate students in producing interconnected ideas and their ability to compare, distinguish and strategic thinking to reach the required knowledge.

4- The ability of postgraduate students to think deeply in order to reach the building of self-plans to achieve what they must accomplish and reach.

5- Creating self-schemes for graduate students by building knowledge, skills, experiences and mental abilities capable of achieving what they aspire to.

The Research Aims:

1- Recognizing the depth of knowledge of postgraduate students.

2- Identifying the differences in the level of cognitive depth among graduate students according to the variables (gender, specialization and stage).

3- Identifying the statistically significant differences in the correlation between the depth of knowledge according to the variable of gender (males - females), specialization (scientific - human) and the stage of study (Masters - PhD).

The Research Terms:

First: The Depth of Knowledge

1- Idiomatic Definition:

Defined by (Holmes, 2011) the depth of knowledge:

(It is the levels of thinking that students must master in processing knowledge).

(Ibrahim, 2017: 109)

(Al-Otaibi, 2007) was defined it as the depth of knowledge:

(It is to focus on the main concepts and ideas of the topic in a way that enables students to examine the links and relationships between them to produce a relatively deep understanding). (Hussain, 2019: 10)

Webb (2002, Webb) defined it as the depth of knowledge:

(It is an educational process that requires teachers to explain the depth in which learning takes place, and teachers must reflect this depth

and specify the purpose of their education to students, and evaluate them on the basis of the information that must be retained for lifelong learning. (Shaheen, 2020: 422).

2- The Procedural Definition of The Researcher:

(It is the ability to apply what students learn from information, knowledge, skills and experiences resulting from the educational process in order to achieve learning goals and develop their cognitive structure and mental abilities in order to develop these abilities to help them solve complex scientific problems that they face).

Or (it is the total score that the student obtains through his answers to the paragraphs of the cognitive depth scale prepared by the researcher).

The Research's Limits:

The current research is limited to postgraduate students (diploma, masters, doctorate) of both sexes (males, females) at the faculties of the University of Qadisiyah for the academic year (2020-2021).

Chapter Two

First, The Theoretical Framework:

There are some theories that explain the depth of knowledge, which are:

1- Bloom's Hexagonal Model: Benjamin Bloom and his collaborators (1956) created what is now called Bloom's classification, where the perception in it is from the simplest to the most complex (Bloom, 1956), which we summarized as follows:

Knowledge: The ability to remember and recall or retrieve information and facts of knowledge.

Comprehension: understanding information and facts, which is the most common level of intelligence.

Application: Deduce or apply information from one case to another.

Analyze: deconstructing parts of a whole and understanding their relationship

Synthesis: putting parts together and understanding the relationship between them.

Evaluation: Issuing judgments using evidence and standards.

(Mankiw, et al, 2018:29)

Second: Norman Webb's model (Webb, 1997):

Webb (2002) defined cognitive depth (an educational process that requires teachers to explain the depth in which learning takes place, where teachers must reflect this depth and define the purpose of their education to students and evaluate them on the information that must be retained for life, as Webb) The development of the cognitive depth theory by representing the cognitive component in four levels, where each level deals with a type of thinking process that includes each level, taking into account the difficulty of the task presented, not the degree of similarity in the performance of the task, where the higher level of cognitive depth requires greater understanding and cognitive processing before Learners. The Depth of Knowledge model of (Webb, 1997) presents the cognitive expectations required by standards, curricular activities, and assessment tasks. This model is based on the assumption that curricula elements can all be classified based on the cognitive requirements required to produce an acceptable response, as each group reflects From the tasks a different level of cognitive expectations or the depth of knowledge required to complete the task, as we find that the term knowledge here aims to include all forms of knowledge on a large scale (procedural, declarative , etc.) and from the levels of depth of knowledge in Web (recall and reproduction, skills and concepts, strategic thinking (short-term thinking), extended thinking (ie, extended thinking) (Webb, 2009:5).

- Webb's Depth of Knowledge Levels

Level One: Recall and Reproduction

This level requires the student to write or narrate simple facts, this writing or recitation does not include synthesis or complex analysis but includes basic ideas, where students engage in narrating ideas or words as in the brainstorming activity before written formation or participate in a spelling assessment or Simple vocabulary or require them to write simple sentences (for example, use punctuation correctly). (Webb, 1981: 2).

The first level of retrieval and reproduction also requires recall of information such as the fact or definition of a term or the implementation of a process or a simple scientific procedure where this level requires students to show a response, use a known formula, follow a specific procedure, or perform a clearly defined series of steps (Hess, 2005:1).

Level Two: Application of Concepts and Skills (Concept/Skill)

This level includes the involvement of some mental processes in processing information that goes beyond the usual response, as this level requires students to make some decisions about how to deal with the problem or activity. These procedures involve more than one step. Among the activities covered at this level are:

- 1- Note and describe non-simple patterns
- 2- Explain the purpose and use of the experimental procedure
- 3- Executing the experimental procedures
- 4- Make notes and collect data
- 5- Categorize, organize and compare data
- 6- Organizing and displaying data in tables and charts

(Webb, 2007: 12).

Level Three: Strategic Thinking

This level includes deep knowledge as it requires students to encourage them to go beyond the text and ask them to explain, deepen or link ideas, where students must be able to support their thinking while citing references from the text or other sources. Between a group of passages or students' application of prior knowledge. (Hess, 2004:3).

Strategic thinking is the cognitive process that enables the learner to access previous information, correct false information, explore and synthesize information, as well as ask clarifying questions that are related to the topic, as strategic thinking is one of the most important types of thinking because it includes creative thinking, critical thinking and analytical thinking at the same time. Among the strategic thinking skills are (systematic thinking skill), (reflection skill) and (paraphrasing skill).

Strategic thinking also includes the ability to synthesize information to generate new knowledge and ideas that are more effective and efficient, how to convert these ideas into a product and how to take advantage of the available conceptual tools. (The Elephant, 2016: 63).

Fourth Level: Extended Thinking

The curricular elements assigned to this level require extensive use of higher-order thinking processes such as synthesis, reflection, evaluation, and modification of plans over time, where students participate in investigations to solve real-world problems with unexpected results, as well as the ability of the student to deal with the problem in different circumstances and from different mental landscapes (Webb ,2009:13).

Among the possible activities of this level are

Applying information to solve unclear problems in new situations.

Tasks that require a number of cognitive skills to complete.

Writing or research tasks that involve formulating and testing hypotheses over time.

Tasks that require students to make multiple strategic and procedural decisions.

Tasks that require creating or creating graphs, tables, and charts.

Writing tasks that have a strong focus on persuasion. (Hess, 2006: 2).

Comparison of Bloom's Taxonomy and Webb's Classification of Cognitive Objective Levels

Web Ranking of Depth of Knowledge	Bloom's Taxonomy of Cognitive Objectives
Webb (1997,999)	Bloom's Taxonomy (1956)
• With a wide and flexible scope of knowledge goals.	• Specific and inflexible scope of cognitive objectives.
• It clearly included the importance of enabling learners to apply knowledge to their life	• He did not clearly indicate the importance of enabling learners to apply

situations at levels of knowledge.	knowledge to his life situations.
• It is suitable for areas and topics of specific structure and undefined structure.	• Suitable for specific structure areas and topics only
• Include clearly the activities that the teacher must do to achieve the goals.	• Did not clearly indicate the activities that the teacher must do to achieve the goals
• It includes basic and higher thinking skills.	• It includes only basic thinking skills.
• Focuses on active knowledge, which means knowledge that learners can transfer to new situations.	• Focuses on passive knowledge and it means knowledge that learners cannot transfer to new situations as a result of memorizing this knowledge without understanding it.
• Focuses on superficial and shallow knowledge and deep knowledge directly (explicit).	• Focuses on superficial and shallow knowledge, and a little indirectly (not explicitly) deep knowledge.
• It is suitable for both beginners and expert students.	• It is especially suitable for beginners students.
• It is commensurate with the theoretical, scientific and practical subjects and disciplines.	• It is particularly compatible with the theoretical (literary) subjects and disciplines.

Third: Ausubel's Learning Theory 1975'Ausubel.

The Ausubel's theory is one of the cognitive theories that explain meaningful learning or meaningful learning. The purposeful learning theory was proposed by a psychologist (David Ausubel, 1975), who excelled in the fields of

developmental psychology, educational psychology, psychopathology and self-development, where (Ausubel) assumes that new knowledge must be acquired from interesting (meaningful) material for the learner and based on his previous knowledge, as it allows the interaction of new knowledge with pre-existing ideas through its cognitive activity, and to reach a meaningful learning requires two conditions:

1- The student's desire to learn, if he only wants to store content, then learning will be useful without merging knowledge with what he already knows.

2- The presented content must be logical and psychologically meaningful. The logical meaning is clear and coherent, and the psychological meaning is the experience that each individual carries from his point of view and previous experiences, and therefore the student chooses the content that he considers meaningful.

(Ato, et al, 2015: 627).

Fourth: The Information Processing Form

Obaid (2005) defines information processing as a cognitive process that includes controlling the flow of information entering or leaving the working memory through the use of processors such as receiving information from sensory memory and recalling information from long-term memory, in addition to its inclusion in the processes of identifying symbols in working memory, comparing and detailing them. And storing information in long-term memory, whereas Al-Zogoul (2007) indicated that the information processing model explains the

mechanism of the occurrence of cognitive processes and their role in processing information and producing behaviour. He sees that behavior is not just a set of responses that are automatically linked to stimuli that occur, but rather as a product of a series of processes. The cognitive mediating the reception of this stimulus and the production of the appropriate response to it by tracing the steps and stages through which information is processed according to a processing system characterized by sequence, organization and integration. (Hussain, 2019: 78).

Chapter Three

First: Research Methodology:

The researcher followed the descriptive research method (correlative studies) to reach the results of the research by studying the relationship between the research variables. The researcher has descriptions and values of the phenomenon that he is trying or wants to study, and when it is necessary to identify the extent of the correlation between two or more variables, the researcher resorts to correlational studies or descriptive approaches.

(Elfat, 2018: 62)

Second, The Research Community:

The current research community of postgraduate students in the faculties of the University of Al-Qadisiyah for the academic year (2020-2021) is represented by the number of (1064) male and female students from the master's and doctoral degrees for all faculties at the University of Qadisiyah .

Table No. (1) *The research community for postgraduate students in the faculties of the University of Al-Qadisiyah*

humanities colleges	Master Degree		PhD		Total
	Male	Female	Male	Female	
Faculty of Archaeology	8	12	0	0	20
college of Literature	30	50	17	16	113
College of Education,	75	103	23	11	212

Humanities Departments					
College of Law	28	20	0	0	48
Total	141	185	40	27	393
Scientific Faculties	Master Degree		PhD		Total
	Male	Female	Male	Female	
Faculty of medicine	31	23	6	12	72
College of Veterinary Medicine	13	14	1	7	35
College of Engineering	27	35	0	0	62
College of Science	51	51	7	14	123
faculty of Agriculture	9	7	0	0	16
Faculty of Administration and Economics	54	55	9	11	129
College of Physical Education	19	6	20	6	51
College of Computer Science	10	11	0	0	21
College of Education Scientific Departments	62	76	17	7	162
Total	276	287	60	57	671
total summation	417	463	100	84	1064

Third: The Basic Research Sample:

The basic research sample consisted of (400) male and female students from the Department of Graduate Studies for all faculties of the University of Al-Qadisiyah, and they were chosen by random stratified method according to gender, specialization and academic achievement with a proportional distribution

from (12 faculties at the University of Al-Qadisiyah).

(College of Archeology, College of Arts, College of Administration and Economics, College of Education, College of Physical Education, College of Agriculture, College of Medicine, College of Veterinary Medicine, College of Science, College of Law, College of Engineering, College of Computer Science)

with a number of (165) students and (174) A master's student, with a total of (38) male

students and (32) female doctoral students, and table (2) shows this:

Table No. (2) *The basic research sample for graduate students in the faculties of the University of Al-Qadisiyah according to gender and academic achievement*

Humanities Faculties	Masters		PhD		Total
	Male	Female	Male	Female	
Faculty of Archaeology	3	5	0	0	8
college of Arts	11	19	6	6	43
College of Education, Humanities Departments	28	38	9	4	79
College of Law	10	8	0	0	18
Total	52	70	15	10	147
Scientific Faculties					
College of medicine	12	8	2	5	27
College of Veterinary Medicine	5	5	0	3	13
College of Engineering	10	13	0	0	23
College of Science	19	19	3	5	46
College of Agriculture	4	3	0	0	7
College of Administration and Economics	20	21	3	4	48
College of Physical Education	7	2	8	2	19
College of Computer Science	4	4	0	2	8
College of Education Scientific Departments	23	29	6	3	61
Total	104	104	23	22	253
total summation	156	174	38	32	400

Fourth: The Research Tools:

The current research aims to identify the cognitive depth of postgraduate students, which requires the provision of a scale (cognitive depth), so the researcher built a scale (cognitive depth), and the following is an explanation of the procedures for the scale

1- The Depth of Knowledge Scale :

After reviewing the studies and literature related to cognitive depth, the researcher did not find a scale that fits the objectives of her research - as far as the researcher knows - in Arab magazines and research. To achieve the research goals, the researcher built a scale of knowledge depth to suit graduate students according to the following steps:

1- Determine the concept to be measured

2- Determining the areas of the concept to be measured (if any)

3- Drafting paragraphs and their validity

4- Statistical analysis

The researcher will detail the steps as follows:

A- Defining the concept of cognitive depth:

For the purpose of determining the concept to be measured, the researcher reviewed the literature, previous studies, and theoretical frameworks. In light of this, the researcher adopted Norman Webb's definition (Webb, 1997) because the researcher had previously stated that she had adopted his theory in the depth of knowledge, which he defined: in cognitive information processing) (Holmes, 2011).

B - Defining the areas of the concept of knowledge depth:

In light of the theoretical framework adopted by the researcher in the research, the areas of cognitive depth have been identified according to Norman Webb's theory (Webb, 1997), which occurs through four areas:

C- Recall & Reproduction

D- Concepts and Skills

C- Strategic thinking

H- Extended Thinking

Where the depth of knowledge provides a different entrance to the organization of knowledge and the depth of knowledge varies in complexity depending on the stage of study to which the student belongs in what he must be able to transfer to different situations, and the complexity in the depth of knowledge depends on the amount of previous knowledge of the student and the extent of his ability to make generalizations or Different cognitive structures (Efil , 2018: 239)

C- Drafting and validity of paragraphs:

For the purpose of formulating the appropriate paragraphs to measure the cognitive depth of graduate students, the researcher reviewed previous studies and literature. The researcher found only a study (Shaheen, 2020) to benefit from in formulating the paragraphs of the scale, but the scale prepared by (Shaheen, 2020) is for secondary school students and was The research

is experimental, meaning that it is not suitable for the current research.

For the purpose of formulating the paragraphs, the researcher took into account its formulation:

1- Avoid paragraphs that have more than one meaning

2- The language of the paragraphs should be easy, understandable and clear

3- The absence of some kind of cognitive complexity in the formulation of the paragraphs

4- That the paragraphs achieve the objectives of the research and what can be used from them

5- Avoid double negatives in one sentence

6- It belongs to the theoretical construction of the adopted theory (Elfatt, 2018: 66)

In light of this, (60) items were formulated for the cognitive depth scale in its initial form, and (20) items were dropped by the arbitrators, which led to keeping (40) items to be applied to the students, knowing that the alternatives used in the scale (5) (always apply to me - Applies to me often - applies to me sometimes - applies to me rarely - does not apply to me at all) When correcting, weights are taken (5, 4, 3, 2, 1,) and paragraph No. (4) in the scale is considered a negative paragraph, that is, it takes weights or degrees of alternatives in a way Opposite, for example: (The alternative always applies to me) takes the weight / degree (5) in the positive paragraph, but in the negative paragraph it takes (1) and so on the rest of the alternatives) and as shown in Appendix (2) and each alternative represents a degree of cognitive depth by (15) A paragraph for each field, and Appendix (2) illustrates this, and for the purpose of verifying the validity of the paragraphs, the cognitive depth scale was presented to (20) arbitrators specialized in educational and psychological sciences,

Preparing Cognitive depth meas. instructions:

The scale instructions are a guide that guides the respondent to how to answer, so the researcher took into consideration in preparing the instructions that they should be clear, accurate, easy to understand and appropriate to the level of the examinees. How to answer, and the respondents were asked to answer them honestly and openly for the sake of scientific interest. The

examinees or respondents were asked not to mention their names in order to overcome the inclination factors of approval and lack of embarrassment, and the examinees were reassured to keep the answer confidential and only the researcher viewed it and that the scale was intended for purposes Scientific research only.

C- The Preliminary Survey:

The aim of the exploratory study is to identify the extent to which the instructions and paragraphs are clear in terms of wording, meaning and the time it takes for the respondent to respond to the paragraphs of the scale. Therefore, the scale was applied to a randomly-purposive sample of both sexes of (15) male and female graduate students at the University of Al-Qadisiyah .The researcher discussed with the respondents the clarity of the instructions and paragraphs of the scale, and it was found from the application that the instructions and paragraphs were clear, and the average time for answering was (15) minutes, and the minimum time was (11) minutes, and the highest time was (18) minutes.

F- The Scale Correction:

The cognitive depth scale consists of (60) items, and for the purpose of correcting the scale and finding the total score obtained by the

respondent, the researcher placed five alternatives in front of each paragraph, ranging from complete agreement to the content of the paragraph and total rejection, as each situation represents a degree of cognitive depth and the respondent chooses one alternative. From these five alternatives, and when correcting, the alternatives are taken (it always applies to me - applies to me often - applies to me sometimes - applies to me rarely - never applies to me) (5-4-3-2-1) as the higher degree indicates that the respondent He has a high level of cognitive depth and vice versa, the lower the respondent's degrees, the lower the level of cognitive depth.

g- The Statistical Analysis of The Scale Items (a Sample of Statistical Analysis)

The sample of statistical analysis consisted of (400) male and female graduate students at the University of Al-Qadisiyah selected by random stratified method according to (gender - specialization - academic achievement) with a proportional distribution of graduate students of all faculties of the University of Al-Qadisiyah by (156 males) and 174 females) for the master's degree, (38 males) and (32 females) for the doctorate, and table (5) shows this.

Table No. (5) *Research Sample Statistical Analysis*

Colleges of the University of Qadisiyah	Master		PhD	
	Male	Female	Male	Female
Humanitarian	52	70	15	10
Scientific	104	104	23	22
Total (400)	156	174	38	32

The Discriminating Power of The depth of Knowledge Scale Items:

The researcher verified the discriminatory power of the cognitive depth scale items using the two peripheral groups method by applying the scale items to the statistical analysis sample of (400) supervisors. After correcting the answers, the researcher followed the following steps:

1. Determining the total score for all the cognitive depth scale forms,
2. The scores are arranged in descending order from the highest score to the lowest score,
3. The two extreme groups were determined in the total score at a rate of (27%) for the upper group, and the scores of the members of the higher group ranged between (181 - 152)

And a percentage (27%) for the lower group of questionnaires, and the scores of the members of the lower group ranged between (130 - 73), as this percentage gives two groups with the largest size and maximum differentiation (Kelly, 1973, p 122), and the number of individuals reached (108) in the upper group. (108) in the lowest group, i.e. with a total of (216) individuals,

4. Using the t-test for two independent equal groups, the significance of the differences between the average scores of the lower and

upper groups was tested by comparing the calculated T-value for each paragraph of the cognitive depth scale with the tabular value. It was found that the differences were statistically significant at the significance level (0.05) and the calculated value is higher than the value The tabular (1.98) and with a degree of freedom (214) for each paragraph of the scale, it has a good ability to distinguish, and Table () shows the discrimination of the paragraphs of the cognitive depth scale.

Table (6) *T-test for two independent samples to find out the discriminatory power of the items of the cognitive depth scale in the two-end group method*

Significance level at 0.05	Calculated T-value	standard deviation	Arithmetic mean	Group	Paragraphs
Function	5.915	1.022	3.759	upper	F1
		1.030	2.926	Lower	
Function	6.714	0.846	4.296	upper	F2
		1.141	3.370	Lower	
Function	7.515	0.656	4.667	upper	F3
		0.981	3.806	Lower	
Function	9.235	0.928	4.213	upper	F4
		1.188	2.861	Lower	
Function	8.039	0.803	4.528	upper	F5
		1.330	3.315	Lower	
Not function	8.941	0.523	4.769	upper	F6
		1.133	3.685	Lower	
Function	4.546	1.254	3.843	upper	F7
		1.325	3.037	Lower	
Function	7.947	0.645	4.704	upper	F8
		1.082	3.731	Lower	
Function	12.373	0.740	4.222	upper	F9
		1.108	2.620	Lower	
Function	7.891	0.514	4.815	upper	F10
		1.120	3.870	Lower	
Function	9.414	0.755	4.472	upper	F11

		1.066	3.278	Lower	
Function	11.004	0.630	4.574	upper	F12
		1.016	3.296	Lower	
Function	10.693	0.631	4.648	upper	F13
		1.014	3.407	Lower	
Function	5.198	0.854	4.593	upper	F14
		1.369	3.778	Lower	
Not function	6.353	1.362	3.352	upper	F15
		1.107	2.269	Lower	
Not function	9.381	0.663	4.500	upper	F16
		0.987	3.417	Lower	
Function	13.017	0.754	4.463	upper	F17
		1.018	2.861	Lower	
Function	9.809	0.530	4.787	upper	F18
		1.060	3.657	Lower	
Function	9.477	0.650	4.769	upper	F19
		1.384	3.361	Lower	
Function	11.774	0.601	4.556	upper	F20
		1.027	3.194	Lower	
Function	8.633	0.845	4.426	upper	F21
		1.105	3.259	Lower	
Function	10.139	0.771	4.176	upper	F22
		0.984	2.944	Lower	
Function	5.758	0.934	4.315	upper	F23
		1.140	3.491	Lower	
Function	7.868	0.702	4.454	upper	F24
		1.161	3.417	Lower	
Function	10.293	0.648	4.509	upper	F25
		1.025	3.296	Lower	
Function	9.947	0.753	4.352	upper	F26
		1.122	3.046	Lower	

Function	11.363	0.749 1.174	4.333 2.796	upper Lower	F27
Function	8.305	0.766 1.075	4.454 3.389	upper Lower	F28
Function	12.819	0.978 1.101	4.157 2.324	upper Lower	F29
Function	13.035	0.709 0.931	4.037 2.556	upper Lower	F30
Function	7.400	1.105 1.171	4.111 2.954	upper Lower	F31
Function	12.539	0.750 0.967	4.083 2.593	upper Lower	F32
Function	12.883	0.765 1.036	4.352 2.741	upper Lower	F33
Function	13.663	0.707 1.195	4.380 2.537	upper Lower	F34
Not function	13.016	0.674 1.056	4.352 2.769	upper Lower	F35
Function	14.070	0.902 1.030	3.991 2.120	upper Lower	F36
Function	12.503	1.035 1.181	4.222 2.315	upper Lower	F37

The Correlation of Paragraph Scores With The Total Score of The Scale

The correlation coefficient between the degree of each paragraph and the total score of the scale was calculated using the Pearson correlation

coefficient, and the value of the correlation coefficient was tested using the t-test for the significance of the correlation coefficient. greater than the tab value (1.96) and the table () shows that .

Table (7) *Correlation coefficients of the paragraph degree with the total degree of the cognitive depth scale*

N o.	correlat ion coeffici ent	T-test for correlat ion coeffici ent	Signific ance at 0.05	N o.	correlat ion coeffici ent	T-test for correlat ion coeffici ent	Signific ance at 0.05	N o.	correlat ion coeffici ent	T-test for correlat ion coeffici ent	Signific ance at 0.05
1	0.302	6.320	Function	14	0.299	6.251	Function	27	0.548	13.070	Function
2	0.375	8.070	Function	15	0.329	6.950	Function	28	0.519	12.113	Function
3	0.428	9.448	Function	16	0.475	10.769	Function	29	0.574	13.984	Function
4	0.446	9.941	Function	17	0.604	15.119	Function	30	0.589	14.540	Function
5	0.414	9.073	Function	18	0.478	10.857	Function	31	0.357	7.625	Function
6	0.491	11.244	Function	19	0.505	11.672	Function	32	0.608	15.278	Function
7	0.271	5.617	Function	20	0.596	14.807	Function	33	0.653	17.201	Function
8	0.448	9.997	Function	21	0.504	11.641	Function	34	0.581	14.241	Function
9	0.548	13.070	Function	22	0.535	12.633	Function	35	0.621	15.806	Function
10	0.509	11.797	Function	23	0.326	6.880	Function	36	0.614	15.519	Function
11	0.497	11.426	Function	24	0.467	10.536	Function	37	0.568	13.768	Function
12	0.544	12.934	Function	25	0.546	13.002	Function				
13	0.553	13.241	Function	26	0.548	13.070	Function				

The Relationship of the paragraph to the field to which it belongs

The correlation of paragraph scores with the degree to which they belong

The correlation coefficient between the degree of each paragraph and the degree of the domain to which it belongs was calculated using the Pearson correlation coefficient, and the value

of the correlation coefficient was tested using the t-test for the significance of the correlation coefficient. All correlation coefficients were statistically significant at the level of significance (0.05) and the degree of freedom (398), their values The calculated t is greater than the tabular value (1.96), and this gives us an indication that the paragraphs belong to their fields, and the table () shows that.

Table (8) *Correlation coefficients of the degree of the paragraph with the degree of the domain to which it belongs in the cognitive depth scale*

correlation coefficient	No.	correlation coefficient	T-test for correlation coefficient	Significance at 0.05	No.	correlation coefficient	T-test for correlation coefficient	Significant at 0.05
first field	1	0.379	8.171	Function	6	0.582	14.278	Function
	2	0.56	13.485	Function	7	0.338	7.165	Function
	3	0.457	10.250	Function	8	0.541	12.833	Function
	4	0.571	13.876	Function	9	0.617	15.641	Function
	5	0.591	14.616	Function	10	0.536	12.666	Function
Second field	11	0.544	12.934	Function	16	0.535	12.633	Function
	12	0.568	13.768	Function	17	0.647	16.928	Function
	13	0.608	15.278	Function	18	0.551	13.172	Function
	14	0.417	9.153	Function	19	0.629	16.142	Function
	15	0.389	8.424	Function	20	0.667	17.860	Function
	21	0.588	14.503	Function	26	0.641	16.661	Function
Third field	22	0.649	17.019	Function	27	0.609	15.318	Function
	23	0.455	10.193	Function	28	0.660	17.526	Function
	24	0.627	16.057	Function	29	0.543	12.900	Function

	25	0.671	18.054	Function	30	0.664	17.716	Function
	31	0.499	11.487	Function	35	0.739	21.883	Function
	32	0.688	18.913	Function	36	0.769	23.999	Function
	33	0.743	22.147	Function	37	0.681	18.553	Function
	34	0.713	20.287	Function				

Chapter Four

First, Show The Results:

schedule ()

Three-way analysis of variance results

On the significance of the differences in the depth of knowledge among graduate students according to the variables:

Gender (males, females), academic major (scientific, humanitarian), and study stage (Masters, PhD)

Contrast S.V	source	sum of squares S,S	Degree of freedom D,F	mean squares M,S	f value		Indication level 0.05
					Tabular	Calculated	
Gender		766.843	1	766.843	3,89	1.966	nonfunction
Specialization		12.393	1	12.393		0.032	nonfunction
first strategy		321.733	1	321.733		0.825	nonfunction
Specialization* sex		706.426	1	706.426		1.811	nonfunction
Level * sex		360.682	1	360.682		0.925	nonfunction
Specialization* stage		20.953	1	20.953		0.054	nonfunction
triple interaction		108.110	1	108.110		0.277	nonfunction
Error		152870.581	392	389.976			
Total		155167.721	399	766.843			

The Statistical Treatment in Table () Indicates The Following:

There are no statistically significant differences in the degrees of cognitive depth among graduate students according to gender variables (males, females). 05) and two degrees

of freedom (1-392). This result can be explained:

There are no statistically significant differences in the degrees of cognitive depth among graduate students according to the variable of academic specialization (scientific, human), as the calculated t value reached (0.032), which is smaller than the tabular value of (3.89) at the level of significance (0,032). 05) and two degrees of freedom (1-392).

There are no statistically significant differences in the degrees of cognitive depth among graduate students according to the variable of study stage (Master's, PhD), as the calculated t value reached (0.825), which is smaller than the tabular value of (3.89) at the level of significance (0, 05) and two degrees of freedom (1-392).

There are no statistically significant differences in the depth of knowledge according to the interaction of gender (male-female) with specialization (scientific-human), as the calculated t-values were (1,811) which is smaller than the tabular value of (3,89), at the level of significance (0.05) and two degrees of freedom (1-392).

There are no statistically significant differences in the depth of knowledge according to the interaction of gender (male-female) with the study stage (Master's, PhD), as the calculated t-values were (0.925), which is smaller than the tabular value of (3.89), at the level of Significance (0.05) and two degrees of freedom (1-392).

There are no statistically significant differences in the depth of knowledge according to the interaction of the study stage (Masters, PhD) with the specialization (scientific-humanity), as the calculated t values were (0.054), which is smaller than the tabular value of (3,89), at the level of Significance (0.05) and two degrees of freedom (1-392).

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