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MEASURING THE COGNITIVE BURDEN OF KINDERGARTEN CHILDREN

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Abstract:

The current research aims to know the cognitive burden of governmental and private kindergarten children, and to achieve the purpose of the research, the researcher adopted John Sweller's theory (1980) and his definition of cognitive burden.Theresearcher constructed a test (Naba Abd al-Hussein, 2019) for the perceptual burden, which reached (24) paragraphs by (12) paragraphs for each area of burden Cognitive, and the test was presented to a group of specialists in educational and psychological sciences, kindergartens, measurement and evaluation, and their number reached (21) experts, and they agreed on all the test items by 100% with some simple modifications to the images of some paragraphs, and the test score (b) was determined by(0, one) according to the opinions of experts and specialists in measurement and evaluation.

As a score of (zero) is given in the case of the wrong answer, and a score of (1) is given in the case of the correct answer, a form was prepared to record the child's response to the test, and the researcher conducted an exploratory experiment in which it was applied.

The test was on a random sample of (30) children to ensure the clarity of the paragraphs and instructions and to adjust the time of testing, and the time taken to answer the test for children aged (5-6) years (20) minutes. In light of the research objectives, the test was applied individually to a sample of government and pre-school children in Kindergarten, who were chosen in a simple random way, and their number reached (180) children and girls.

The researcher used in the test two validity indicators, namely apparent validity and construct validity, and the test reliability was estimated using the internal consistency method and employing the (Keoder Richard Sonn 20) equation and the reliability coefficient was (72.0).This ratio is good because it is higher than the average.
According to the objectives of the research, and after applying the test to the members of the research sample and analyzing their responses statistically, (2 items) were excluded from the field of collecting information and (2 items) from the field of interaction of the elements, and thus the number of test items became in its final form (20 items). Government and civil society suffer from a cognitive burden.

Research Problem:

The early childhood years are the basis for learning and acquiring various skills, as it is the stage in which the child's senses are sharpened, which are the gates and gates of knowledge for his mind, and if they are not activated during this period, the child cannot properly perceive and does not receive the various sensory stimuli properly (Bahadur, 2002: 30), and the rapid changes that the world witnessed and development in kindergarten curricula, which imposed on the minds of children an additional burden represented by the large amount of cognitive elements and stimuli presented in the educational situation that challenge them and exhaust their minds and brains, which requires education.

Children reduce this large number of units and cognitive elements without losing anything from them, since learning does not happen unless the child interacts with the situation, that is, new experiences are formed, and in the event of poor learning, that is, learning is negative because of some methods and methods of traditional education based on recitation, memorization, and indoctrination will affect the cognitive structures of the child.
As such, this imposes an additional effort on working memory (short term) in the strategy and type of treatment that you conduct (Abu Allam, 2015: 8), and overburden it. For a child to write many pages of duties that do not fit with this age stage and not to give the children a period of time to think about the answer, the teacher is the one who asks, and she/he is the one who determines the answer that the child must provide, and not organizing educational experiences in a way that facilitates learning and remembering it unless it is linked to previous experiences he has, and not using the feedback from time to time for the information to be remembered to keep it in memory, because the review process and listening to experiences help in the success of the integrated educational experience.
All of this generates a cognitive burden on the child and reflects negative effects on his performance of the activities and tasks required His behavior, and his interaction with those around him (BRICK, 2018: 17), so one of the basics of learning deficiency is the low ability of children to understand and process information, which makes them not invest their minds when presenting experiences and activities to them, which leads to a weak ability to perform well.
Many children have a low level of their mental skills in organizing and processing information (Khuzam, 1993: 329). Through the researcher's work in the educational field in kindergartens for two years, I found that there is a problem. Children suffered from it, which is that despite the information, stimuli, and the abundance of items presented during the experience, some children have a lack of attention and focus on them, cannot understand and comprehend them, are unable to perform the activity required for them, and face difficulty in their learning for a wide range of Experience.
There are other children despite their attention and focus during the experience, some of them fail to learn and are unable to remember and recall the information and experiences they went through. Based on the foregoing, the researcher believes that it is necessary to deal with the

child and prepare him so that he is able to face the vast amount of information that increases every day.

This is what prompted the researcher to identify the cognitive burden of government and pre-school kindergarten children, especially since there are no studies to the best of knowledge.

The researcher dealt with the aspect that the researcher aims to apply, which is "the cognitive burden of the Riyadh sample." Through what was presented, the research problem can be identified by the following question: Is there a cognitive burden on the governmental and private kindergarten children?

The importance of the research:

The importance of the current research stems from the importance of childhood, because of its special importance to society as the basic basis on which the following stages of development are built (Al-Sayed, 1975: 18), due to its great influence on the formation of the child's future personality, which affects him negatively and positively according to the environment in which he lives (Al-Sorour, 1998: 383).

The scientist Piaget stressed the importance of this stage of the child's life, which ranges between (3-7) years, as it is an essential stage of its development and he called it the pre-operative stage (Zaghoul, 2008: 234). As the child at this stage becomes more capable of attention and focus, attention to information, love of discovery and exploration, and possesses multiple mental skills, such as attention, remembering, perception, analysis, thinking and innovation (Zakaria, 2009: 6-17), and the child's enrollment in the kindergarten institution is a shift in behaviors The child from the home to the external community, which positively affects his physical needs during play and movement.

Likewise, the child learns in it the acquisition of information and habits and the organization of his lifestyle that prepares him for the future, as this period represents the growth of the mind and body together (Ali, 2014: 3), The child's permanent dealings with his environment and his interaction with it requires him to know this environment, so that he can adapt to it and invest it, protect himself from its dangers and participate in its activities, and the only condition in this knowledge is attention to what interests him from this environment and perceives with his senses so that he can influence it. He controls it with his mind and his muscles.

Attention and sensory perception are the first step in the child's contact with his environment and his adaptation to it. Rather, they are the basis on which all other mental processes are based. Without them we could not perceive or remember We do not learn something or think about it, so in order to learn something or think about it we must pay attention to it (Rajeh 2009: 155), and perception is the third process that begins its work after the attention so that the individual organizes the sensations that the senses provide us with and makes them meaningful (atom) Al-Jarrah and Al-Hamouri, 2015: 232), and since learning is one of the most important concepts that have changed dramatically due to the development of our current era, which is witnessing a great spread of technology in all fields (Nasreen, 2017: 7).

Teaching and learning together are one process in terms of the strategies that the teacher and the learners must follow and employ in solving various problems. Likewise, learning is not measured by the amount of what is preserved, but by the amount of what is symbolized and stored and easy to retrieve as quickly and in the best quality as possible (Abu Judeh, 2004: 8).

Therefore, it is necessary to shed light on the problems that cause failure, impediment or weakness of the learning process, and since the cognitive burden is one of the major problems facing the learning process, it must be shed light on them, their causes should be explained and work to avoid them, because there are learners who fail to find the appropriate solution or to achieve the task or activity required of them.

This prompted specialists to search for the cause of this failure, on top of whom is John Sweller, and he based this on the activity of working memory (Naima, 2019: 59), it occurs due to the use of methods Traditional education that continuously pumps information and experiences to children, and the child's role is the role of the recipient and the listener only, as well as not giving him a time for opportunity to direct his attention to the information provided to encode, process and store it in his working memory and then in long memory.
This is where the cognitive burden occurs as a result of failure in mental processes, for the memory to perform the function of storing information; it must encode them well and organized. Then process and store it, so the information coding stage is the most important stage, because well-coded and well-organized information will facilitate remembering them.
Thus, this will lead to a reduction in the cognitive burden, and there are certain symptoms that appear on children who suffer from a cognitive burden, such as mental lockdown, a decrease in the child's level of competence in performing the activities of the experience, and the inability to retain information or activities and understand them, so the child is not Able to process information, because the understanding occurs when processing all the information elements related to the experience or the material presented simultaneously in the working memory.
The material will become difficult to understand (Hassan, 2018: 3). There are three types of perceptual burden:-

The first type is perceptual burden, which is the internal or intrinsic one that is caused by the internal complexity of learning materials (i.e., this highlights the type of burden in the difficulty of the content to be learned).

The second type is the external perceptual burden or the intruder, which is the burden imposed by the structure of the learned material, which includes the method of designing education and its presentation (i.e., this burden appears in the teaching method used).

The Third type is the burden Perception is closely related or appropriate and results from the processing that the learner performs when building cognitive schemes around the content, or to do a deeper treatment such as self-interpretation or the conscious application of learning strategies (Blarney, Kalyuge & Sweller, 2015, P203).
This type will contribute to the learning process and instead of contradicting it, it will help in building good and complex cognitive schemes in a successive way that aids the child or the learner in moving between the stimuli presented to him and memorizing the useful information, which means that it effectively donates to reducing the cognitive burden and achieving the required experience, activity or task (Al-Abadi, 2014: 6).

Research Objective

The current research aims to know the cognitive burden of governmental and private kindergarten children.

Research Limitation:

The current research is determined for kindergarten children enrolled in governmental and pre-primary kindergartens, whose ages range from (5-6) years of the General Directorate of Education in Baghdad in its two sides / Al-Karkh and Rusafa for the academic year (2019-2020).

The concept of cognitive burden:

The cognitive burden is one of the topics that have spread and received great attention among many researchers, because it represents a central point in the success or failure of cognitive processing at the level of the working memory of the learner, as working memory is the seat of effective cognitive processing and failure occurs due to the insufficient cognitive ability available for the learner.

Also, because of the large amount of cognitive elements that compress the working memory which lead to the occurrence and increase of the perceptual burden and thus the work and efficiency of the working memory will be weakened.

So, the perceptual burden refers to any information imposed on the working memory and results either from the newness of the information or the exciting or from the large number of similarities between the information and the stimuli, or the increase in the number of items and units offered (Nisreen, 2017: 12-13). The perceptual burden can be defined as "the total amount of mental activity in working memory during a certain time, measured by the number of units or cognitive elements" (Abu Riach, 2007: 193).

Studies and researches conducted on brain functions indicate that the different cognitive systems are distributed on different areas of the brain and can functionally integrate through excitation. So, any defect affecting one of these systems disturbs their integration.This results in disturbances in perception or cognitive functions that lead to interference or confusion in children when they receive information or stimuli from. Through one of the systems or media with the information or stimuli that they receive through another medium and this is reflected in a tangible decrease in their ability to withstand this interference or interferes.

Thus, it becomes difficult for them to receive the information or stimuli through different media or cognitive systems at the same time, and it becomes their perceptual system which is overloaded and unable to perform processing and processing operations with adequate effectiveness or efficiency (Melhem, 2001: 226).

Types of cognitive burden:

First: the internal cognitive burden:

This type of burden occurs through the interaction that takes place between the material that is learned and the level of the learner's experience (Abdul Amir, 2013: 617). This type of burden is called another name (intrinsic perceptual burden). Cognitive processing to complete a specific activity, experience, or specific task, which is determined by the difficulty and complexity of the task or the content of the experience or the study material (Faizal & All, 2015, P12) (If the course material contains many concepts or elements and a weakness in the process of organizing the academic content),the level of difficulty of its elements and the degree of interaction between them), the learner will find it difficult to process it simultaneously in working memory, so this material will become difficult to understand (sweller et al. 1998, p9).

Second: the external cognitive burden:

This type of cognitive burden occurs as a result of the educational techniques that learners need to participate in learning activities that are not related to the form of the cognitive construction scheme of the learner, (Palincsar, 2003, P.459). This type of burden relates to ineffective instructional design and the manner or style of presenting experience.

Otherwise, the activity (such as pictures, drawings, tables, or concept maps), which is characterized by the difficulty and complexity that affect the efficiency of cognitive processing of information, so the use of a complex and difficult method of presentation and

not suitable for the age or tendencies of children will lead to failure in the delivery of information or experience to them And the occurrence of external perceptual burden (Naima, 2019: 59-60).

Third: the cognitive burden is closely related:

The closely related cognitive burden differs from the previous two types of perceptual burden in its positive relationship with learning, because it arises as a result of devoting cognitive resources to acquiring and forming cognitive structures, as well as a result of the learner's involvement in understanding the educational material and finding interconnections between its elements and between what he has Previous knowledge in his cognitive structure, and his idea arose out of the need to define and construct cognitive schemes and automatic activities, which are useful for learning as assumed by the perceptual burden theory (El-Fil, 2015: 89-91).

Perceptual burden theory:

In the early eighties, the Australian psychologist (John Sweller, John Sweller) from the University of New South Wales in Australia laid the foundation stone for the cognitive burden theory, so he tested the educational effects of the memory model called the cognitive burden theory. This theory was based on the results of research related to learning and education and is based on Concepts of processing information in memory, developing plans, and a procedural knowledge mechanism (Abu Riach, 2007: 177-191).

Therefore, one of the most prominent factors and reasons that led to the emergence of the perceptual burden theory is the limited capacity of short-term memory (working memory), which often hinders the occurrence of the learning process.

The perceptual burden theory developed in the late nineties of the last century and focused on individuals learning to solve problems, because problem solving imposes exceptional demands on short-term memory (El-Fil, 2015: 82). With educational tasks, this theory has developed over the past twenty years, focusing on building educational materials (Qatami, 2013: 558), and influenced by developments in the fields of cognitive psychology and learning design. Yummy and educational technology innovations, according to John Sweller Jhon, that the large storage of genetic information that continues in a renewed manner in coordination with the environment produces continuous differences and changes, the active ones that disappear with the passage of time and similarly, the cognitive building of the individual is a large store of portable information in long-term memory, which works to coordinate our cognitive activities (Sweller, 2004,9).

Accordingly, we can see that learning occurs through two types of memory: working memory and long-term memory, and theorists believe that working memory is the active component that processes the required information. , And that the information to be processed imposes a high level due to its novelty and exceeding its number and this is what the working memory cannot absorb within a limited time.

The perceptual burden theory refers to any information imposed on the storage and processing of the memory of the available information, and increasing the amount of similarity between the information that requires the individual categorized and tested them, which leads to errors of inaccuracy and generalization (Atkinson, 2000, 181).

The theory focused on the importance of cognitive and mental processes in developing the abilities of children. Individuals and helps them to develop their cognitive structures and deal with knowledge and information (Abdel-Amir, 2013: 614). John Sweller defined the cognitive burden theory "as an educational cognitive theory and a model for designing learning, education and cognitive engineering (Matar, 2011: 12), and it was based on two assumptions:

1- Active treatment through attention.
2- The assumption of the dual (dual) channel, because the perceptual burden is carried out through two channels: the audio channel and the visual channel (Elliott & Others, 2009, P5).

In the second half of the nineties, researches in the cognitive burden theory focused on reducing the accidental perceptual burden (external or intruder) through educational design, because the perceptual burden is based on the nature of the learning task that is supposed to be exchanged (El-Fil, 2015: 83), so the perceptual burden theory was established. By setting two foundations or two methods for the success of learning and reducing the individual's cognitive burden: -

The first is: the principles of instructional design that are difficult to devise and innovate without considering the individual's cognitive structure (that is, the construction of designs is based on the individual's cognitive construction). **Second:** Shedding more light on the style of construction (Sweller, 2004,9), it is important to link the cognitive construction of the individual with educational designs, because the unique aspect that distinguishes human thought is the quantitative aspect, which is the volume of information in long-term memory that causes differences Intellectual property among humans and among other organisms, therefore, educational designs must be based on the individual's cognitive storage to achieve the greatest amount of learning (Sweller, 2003, 215).

Research Methodology:

1- Population of the Research

The research community consisted of all governmental and private kindergartens affiliated to the General Directorates of Education in Baghdad with its two sides Al-Karkh (first, second, and third), and Al-Rusafa (first, second, and third) who are 5-6 years old (pre-school stage) of both sexes (Males and females) for the academic year (2018-2019) distributed into (181) governmental kindergartens and (164) private kindergartens.

2- The Sample of Research:

The current research sample was chosen in the following way:
- Selection of the education directorates sample: The researcher chose Baghdad governorate, with its two sides Al-Karkh and Al-Rusafa, which includes six directorates (Al-Karkh first, second, and third), (Al-Rusafa first, second, and third)
- The researcher has determined what represents (10%) of kindergartens in each of the six education directorates for governmental and private kindergartens, indicating (Manzil and Gharaibeh, 2006) that if the community is large in size, then the sample size is (10%) or less of that may be sufficient (Al-Manzil and Gharaibeh, 2006: 26).
- The researcher intentionally chose the children of the kindergarten stage, then randomly selected (4-6) children from each division chosen from the governmental kindergartens, and accordingly, the number of children in governmental kindergarten reached (100) children and a girl by (50) male children,and (50) female children, as the researcher took into account the equality of the number between males and females when choosing, and the number of children in eligibility kindergarten reached (80) children and a girl by (40) male children and (40) female girls, where the researcher took care of equal the number between males and females that when choosing, as shown in table (1):

Table (1)
Distribution of the research sample according to the directorates of education in the city of Baghdad

No. of children		Name of the kindergarten	Ratio of10%	No. of civil kindergartens	No. of children		Name of the kindergarten	Ratio of10%	No. of governmental kinder-gartens	The directorate
Females	Males				Females	Males				
3	3	Zehour Alharthiyah	5	52	2	2	Al-Mansour Al-Tasisyah	3	32	First Al-karkh
3	3	Baghdad			3	3	Alwurod			
2	2	Melaakt Alsanafir			3	3	Alsaif Al-arabi			
2	2	Hibat Allah								
2	2	Altiyor								
3	2	Dar almaarif	2	17	3	3	Alsawsan	3	30	Second Al-Karkh
2	2	Alrawan			3	3	Albanafsaj			
					3	3	Alalyaa			
2	3	Musa Al-Kadhim (PBUH)	3	25	3	3	Almuheet	2	20	Third Al-Karkh
2	2	Alrafidayn			3	3	Al-Kadhmiyah			
2	2	Worood Aljanah								
3	2	Ashbal Algad	2	16	3	3	Alrayaheen	3	28	First-Rusafa
2	2	Alnawaris			2	2	Alrihab			
					3	3	Alafrah			

3	3	Albura m Alsageer	4	43	2	2	Alshimo us	5	51	Second-Rusafa
2	3	Mama Roz			3	3	Alrabee a			
2	2	Aldhuha			3	3	Alfaris			
2	2	Alwan Alworoo d			2	2	Alkarad a alsharqi yah			
					3	3	albasma h			
3	3	Alsuroo r	1	11	3	3	alfirdou s	2	20	Third-Rusafa
					3	3	alhadeel			
40	40		17	164	50	50		18	181	Total

- Research Tool

The researcher built a test (Naba 'Abd al-Hussein, 2019) to measure the cognitive burden of government and pre-school children in Riyadh, whose ages range from (5-6) years, as it is not possible to use the tests and measures designed on a sample with different age groups from the group The age of the research sample (Thorndike and Heigen, 1989: 185), and the following is a review of the procedures adopted by the researcher.

- Procedures for applying the cognitive burden test:

The test construction process goes through several steps, namely:

1- Defining the concept of testing:

The researcher adopted a definition (Sweller & Chadler, 1991), which means “the total amount of mental activity in working memory during a specific time, measured by the number of units and cognitive elements” (Abu Riach, 2007: 193).

2- Defining the areas or components covered by the items of the test that are appropriate for the age group in which the study is being conducted and relied on determining the test areas on Jhon Sweller's theory of perceptual burden in processing information, and accordingly, the perceptual burden test is determined by two areas:

a- Chunking of information: the extent of the child's ability to collect information in meaningful units, which makes the information in the memory occupy less space, and thus allows more cognitive elements to be processed, which leads to greater learning.

b- Element Interactivity: It is defined as the degree to which the information is capable or not comprehensible, in isolation from others, as the child may have the ability to learn simple words every day, but he finds it difficult to produce correct grammatical sentences (Abu Rias , 2007: 191--193).

- Each of the theoretical definition of the test and its fields was presented to a group of arbitrators and specialists in kindergarten and psychology, and it was 100% approved by them.

Drafting the paragraphs of the cognitive burden test:
The researcher formulated the paragraphs for each area of cognitive burden, so the number of paragraphs (24 items) in their initial form were distributed over the two areas of the test, with (12 items) for the field of collecting information and (12 items) for the field of interaction of elements.
The test items included visual stimuli, audio stimuli, and questions that fit these The age stage, in the colloquial dialect (vernacular) as well as in the classical language, took into account in its formulation the clear and understandable style, the suitability of the colloquial language (vernacular) to the classical language and its compatibility with the cognitive abilities of a preschooler (5-6) years old and capable of interpretation One (Abu Allam, 1989: 134).

Preparation of test application instructions:
The researcher prepared instructions for the application of the test in order to unify instructions for all members of the sample, as the researcher formulated the application instructions in the colloquial (vernacular) dialect and also in the classical language, taking into account when formulating clarity and accuracy so that the instructions are understandable to all children.

Validity:
Validity is one of the basic characteristics necessary in building educational and psychological standards. Likewise, the validity of the test is related to the purpose for which the test is built and the decision taken based on its scores (Allam, 2002: 186). It means validity is to what degree the test measures What was put to measure (Al-Damen, 2007: 113). To calculate honesty, the researcher took the following steps:

Face Validity:
It means the expert's judgment on the degree to which the test measures the measured characteristic (ie, compatibility between the arbitrators). The test is ostensibly valid if its title indicates the behavior that it measures (Al-Najjar, 2010: 289). To verify the validity of the test, the researcher presented it (in its fields and paragraphs in its form) First) on a group of specialists in kindergarten, psychology, measurement and evaluation, and their number reached (21) arbitrators, so I put a definition of the cognitive burden and a definition for each of its fields, and I asked them to express their opinions about the validity of its formulation and clarity to measure the cognitive burden, and to verify The validity of the paragraphs in measuring cognitive burden.

- Exploratory application of the cognitive burden test:
The researcher applied the test an exploratory application on a sample of (30) boys and girls (15) male children (15) female children who were randomly selected from (3) kindergartens, by (10) children from Riyadh affiliated to the Second Karkh Education Directorate. Al-Rabiah, Good News, Al-Nisour), and the researcher asked the administration of each kindergarten to create a quiet place characterized by good ventilation and sufficient light with the provision of a suitable table in the middle of two chairs, one for the researcher and the other for the child, and the researcher was sitting opposite the child when performing the applied test for the child.
The aim of this step is to ensure the clarity of the paragraphs and questions related to each paragraph and to correct the questions and instructions or graphic figures and amend them according to the response of the child and the suitability of the paragraphs for the preliminary stage, as well as to identify the time it takes.

So, the researcher made sure after the completion of the exploratory application of The pictures included in the cards are clear and understandable for children, and the question for each paragraph is clear and appropriate for children aged (5-6) years old. As for determining the time allotted for the test, after ensuring the clarity of the instructions and the method of answering, the researcher used an hour to calculate the time it took for each child in the survey sample to answer the test items as a whole, and after this procedure it appeared that the average time for answering the test as a whole was (20) minutes.

The key to correction and the total score of the cognitive burden test:
It is done by collecting the scores that represent the individual's responses to each of the scale paragraphs, and the total score for the cognitive burden test was calculated by calculating the highest and lowest score that the child can obtain upon completing the answer to the (24) items of the test. The highest score for the substitute is (1), and the lowest score is (zero), so the highest score that a child can get on the test as a whole is (24) and the lowest score is (zero) with a hypothetical average (12) .

- Statistical analysis of the items of the cognitive burden test:
The researcher applied the test to a sample of statistical analysis of (180) children, who were selected randomly, stratified, from the governmental and private Riyadh children from the six Baghdad education directorates, next to Al-Karkh and Al-Rusafa, distributed in (18) kindergartens from the government kindergarten And Al-Ahlia in the city of Baghdad with its two sides Al-Karkh and Al-Rusafa, as shown in Table (2):

Table (2)
Statistical analysis sample size

Total			No.of children		No. of civil kindergartens	No. of children		No. of governmental kindergartens	The directorate	Seq.
Total	Females	Male	Females	Male		Females	Male			
40	20	20	10	10	2	10	10	2	First Al-karkh	1
30	15	15	5	5	1	10	10	2	Second Al-Karkh	2
20	10	10	5	5	1	5	5	1	Third Al-Karkh	3
20	10	10	5	5	1	5	5	1	First Rusafa	4
50	25	25	10	10	2	15	15	3	Second Rusafa	5
20	10	10	5	5	1	5	5	1	Third Rusafa	6

180	**90**	**90**	**40**	**40**	**8**	**50**	**50**	**10**	**6**	**Total**

- Paragraph difficulty coefficient and discriminatory power of the two extreme groups of cognitive burden test items:

a. Paragraph difficulty factor: The difficulty factor of the test items was calculated by the researcher taking the following steps:
1- The children's total scores on the cognitive burden test were arranged in ascending order (from the lowest score to the highest score).
2- The upper and lower 27% of the total grades were chosen to represent the two extremes, and the number of children in both groups was (49) boys and girls.
3- The number of children who answered correctly for each paragraph of the test paragraphs in both the upper and lower groups was counted, then the paragraph difficulty equation was used and in order to judge the difficulty of the paragraph by keeping or excluding the paragraphs, the researcher determined the acceptable range of paragraphs and counted the paragraph is good if it was Its difficulty coefficient ranges from (0.30 - and higher).
Respectively (0.20), is not statistically significant from the field of interaction of elements, because it obtained scores less than (30.0) and according to the (Ebel) criterion, it is not significant (not distinct) (Ebel M, 1972:399), as shown in the table (3).

B - The discriminatory power of paragraphs:
The distinction of the paragraphs was calculated by applying the test to the sample of statistical analysis of (180) children and using the power discrimination equation (Item Discrimination) for the paragraphs. The researcher adopted the paragraphs whose discrimination coefficient ranges from (30.0 and above) because they are a (distinctive) function.
According to the (Ebel) criterion (Ebel M, 1972,399), and to calculate the discriminatory power of the test items, the researcher arranged the children's total scores on the cognitive burden test in ascending order (from the lowest score to the highest score), and the number of children in both higher groups and the minimum is (49) children and a girl, and the number of children who answered correctly for each paragraph of the test in both the upper and lower groups was calculated, and by adopting the formula for distinguishing the test items.
It shows that (20) items are distinguished, and paragraphs (3, 5) Which amounted to (0.12) and (0.16) respectively are not distinct from the field of information gathering, and the paragraphs (15 and 17) which amounted to (0.04) and (0.20) respectively are not distinct from the field of interaction of elements. As shown in Table (3):

Table (3)
Paragraph difficulty coefficient and discriminatory power by the two extremes method of cognitive burden test

Significance	Para-graph difficulty	Discrim-inatory power	Lower group answer (Single) 27%	Upper group answer (Single) 27%	Paragraph **No.**
Sig.	**0.43**	**0.45**	**10**	**32**	**1**
Sig.	**0.47**	**0.57**	**9**	**37**	**2**

Non- Sig.	**0.27**	**0.12**	**10**	**16**	**3**
Sig.	**0.52**	**0.31**	**18**	**33**	**4**
Sig.	**0.65**	**0.16**	**28**	**36**	**5**
Sig.	**0.32**	**0.43**	**5**	**26**	**6**
Sig.	**0.56**	**0.39**	**18**	**37**	**7**
Sig.	**0.32**	**0.35**	**7**	**24**	**8**
Sig.	**0.46**	**0.31**	**15**	**30**	**9**
Sig.	**0.72**	**0.39**	**26**	**45**	**10**
Sig.	**0.42**	**0.39**	**11**	**30**	**11**
Sig.	**0.57**	**0.33**	**20**	**36**	**12**
Sig.	**0.51**	**0.37**	**16**	**34**	**13**
Sig.	**0.42**	**0.35**	**12**	**29**	**14**
Non- Sig.	**0.53**	**0.04**	**25**	**27**	**15**
Sig.	**0.41**	**0.37**	**11**	**29**	**16**
Non- Sig.	**0.65**	**0.20**	**27**	**37**	**17**
Sig.	**0.51**	**0.41**	**15**	**35**	**18**
Sig.	**0.42**	**0.35**	**12**	**29**	**19**
Sig.	**0.43**	**0.37**	**12**	**30**	**20**
Sig.	**0.48**	**0.47**	**12**	**35**	**21**
Sig.	**0.35**	**0.37**	**8**	**26**	**22**
Sig.	**0.53**	**0.45**	**15**	**37**	**23**
Sig.	**0.34**	**0.39**	**7**	**26**	**24**

- Validity of paragraphs:

1- The relationship of the paragraph score to the total score of the test:

The researcher used the Pearson correlation coefficient to extract the relationship between the degree of each paragraph of the scale and the total score for it, and it was found that all the paragraphs are statistically significant except for the paragraphs (3, 5, 15, 17) as they are not statistically significant because the calculated T value for them is greater than the value The tabular amount (14.0) is at the level of significance (05.0) and at the degree of freedom (178), as shown in Table (4).

2 - The relationship of the total score of the test to the total score of the field:

In order to calculate the correlation of each paragraph with the total degree of the field to which it belongs, the researcher used the Pearson correlation coefficient and the results showed that all the paragraphs are statistically significant except for the paragraphs that fell in the discriminatory power, as shown in Table (4

Table (4)

Validity coefficients for test items

Significance	Coefficient of Correlation of the Relation of the Total Score of the Test to the Total Score of the Field	Correlation Coefficient of the Relation of the Paragraph Score to the Total Score of the Test	Paragraph	The field
Sig.	**0.37**	**0.29**	**1**	**1-Gathering Information**
Sig.	**0.41**	**0.44**	**2**	
.....	Non-distinguished	Non-distinguished	**3**	
Sig.	**0.31**	**0.15**	**4**	
.....	Non-distinguished	Non-distinguished	**5**	
Sig.	**0.46**	**0.41**	**6**	
Sig.	**0.38**	**0.25**	**7**	
Sig.	**0.39**	**0.24**	**8**	
Sig.	**0.27**	**0.26**	**9**	
indicator	**0.24**	**0.33**	**10**	
Sig.	**0.38**	**0.35**	**11**	
Sig.	**0.27**	**0.20**	**12**	
Sig.	**0.39**	**0.32**	**13**	
Sig.	**0.45**	**0.29**	**14**	**1-Elements Interaction**
.....	Non-distinguished	Non-distinguished	**15**	
Sig.	**0.34**	**0.33**	**16**	
.....	Non-distinguished	Non-distinguished	**17**	
Sig.	**0.28**	**0.15**	**18**	

Sig.	**0.37**	**0.30**	**19**	
Sig.	**0.35**	**0.28**	**20**	
Sig.	**0.5**	**0.42**	**21**	
Sig.	**0.46**	**0.26**	**22**	
Sig.	**0.29**	**0.36**	**23**	
Sig.	**0.31**	**0.18**	**24**	

ReliabilityScale:

It is the accuracy in estimating the real relationship of the individual on the characteristic that the test measures (Al-Najjar, 2010: 296) to calculate the consistency of testing the cognitive burden. The method of internal consistency or homogeneity between the test items was used using the (Keoder-Richard Sohn equation 20) and the cognitive burden constant was (72) 0) This value is good because it is above average.

Description of the cognitive burden test in its final form:

The test consisted of (20) distributed into two domains (information gathering and interaction of elements) by (10 items) for each field, and the total score of the test was calculated by finding the highest score that the respondent could obtain and the lowest score that the respondent could obtain on the test items.

As the highest score that the respondent can obtain is (20), the lowest score is (zero) and the hypothetical average (10). The researcher designed (the answer sheet) to record the children's answers to the test items during the application period and this list included general information about the child (his name, gender, total score for the test, stage, kindergarten name and location) as well as the parts of the test and its instructions that were designed in the manner given,it has the degree directly.

TheResults:

According to the findings of the researcher in her current study of results in the light of the research goal (recognition of the cognitive burden of governmental and private kindergarten children), the null hypothesis: - There is no statistically significant difference between the arithmetic mean of the research sample on the cognitive burden test and the hypothetical average of the test at the level of Indication (0.05).

To verify the validity of the null hypothesis, the researcher adopted the equation for the t-test for one sample to measure the perceptual burden, and it was found that there was a statistically significant difference between the two arithmetic averages, as the calculated T value reached (15.38) degrees, which is greater than the adult tabular value (1.96) a score at a level of significance (0.05) and a degree of freedom (197).

This indicates rejection of the null hypothesis and acceptance of the alternative hypothesis, which states that there is a statistically significant difference between the arithmetic mean and the hypothesis average which is in favor of the arithmetic mean, i.e. in favor of the research

sample, And this indicates the existence of a cognitive burden among preschool children (for the preschool stage) as shown in Table (5):

Table (5)
The calculated T value of the research sample on the cognitive burden test

significance level	The degree of freedom	Tabular T value	The computed T value	The hypothesis mean	Standard deviation	Arith-Metic mean	Sample size
Sig.**0.05**	**179**	**1.96**	**15.38**	**10**	**3.01**	**13.44**	**180**

The Discussion and Interpreting of the Results

In view of our findings, the governmental and pre-primary kindergarten children suffer from cognitive burden, that is, they have difficulty processing and processing information, especially with regard to working memory activity, and this is what John Sweller pointed out in the theory of cognitive burden.

As the large number of stimuli and information displayed in front of the child, which is a cause of distraction and attention, and the novelty of the situation in the memory of the learners, and the old traditional methods, methods used in learning that depend on memorization and indoctrination (hymn) and heavily infuse information and experiences to children. In most cases, the child's role is the role of the receiver and the listener only, as well as the focus of some kindergarten on the mental side of the child, as if the elementary school started at an early stage.

They put pressure on children to learn to read and write, while one of the educational demands is for the mental development of the child in these The stage is not pushing the child to learn to read and write before he is ready for it (Dababneh and Mahfouz, 1984: 22), and that most of the staff in governmental or private Riyadh are not specialists in irrigation.

This is due to the absence of binding instructions for the type of specialization required to work in kindergartens, and most of the non-specialized teachers find it difficult to deal with children as they are not qualified because they are not aware of the requirements and needs of the child's development at this age.

So all these things compress children's memory and carry a burden or additional effort represented in the perceptual burden that afflicts the working memory, which leads to the inability of this memory to perform its functions of coding, processing and storing well.

This information will become difficult to perceive and this leads to the memory failure to retain information, and this was indicated by both (Joanna and Lewis, 2006) in their study, which confirmed the existence of an effect of cognitive burden on working memory efficiency.

Recommendations:

1- Taking into account that the child has reached the level of maturity appropriate to learn to read and write and not to force him to do so in the kindergarten stage.

2- The teachers should focus on the quality of experiences and information that are given to the kindergarten child, not the quantity, and not to increase the number of stimuli presented to him more than necessary, because this will burden the child.

3- The Ministry of Education should assign the teaching tasks in kindergartens to qualified female teachers who are graduates of the Kindergarten Department 4- The Ministry of Higher

Education and Scientific Research must adopt the inclusion of educational theory (the theory of cognitive burden) as a theory of education in universities and the inclusion of this theory within the courses, especially the decisions of the department Kindergarten.

Suggestions:

1- Establishing a program to reduce the cognitive burden of kindergarten children based on the principles and a number of strategies of cognitive burden theory.
2- Conducting some studies and experimental research to study the effect of cognitive burden theory on developing the skills of kindergarten children and increasing their cognitive achievement.

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