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# **The impact of an educational program based on the meta-Cognitive strategies in the development of systemic intelligence among the students of the Ninawa Technical Institute**

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## **Abstrac**

The aim of the study was to identify the impact of an educational program based on the meta-knowledge strategies in the development of organizational intelligence in the students of the Ninawa Technical Institute in the light of the variables of the group and sex and the interaction between them. The sample consisted of 64 students from the accounting and financial and banking techniques, (32) students from the accounting department. The control group consisted of (32) students from the Department of Finance and Banking, as well as equivalence procedures in the variables (tribal test, age in months, gender). The researcher devised an educational program based on meta-knowledge strategies with (14) sessions based on the four meta-knowledge skills according to the For Sternberg's theory (awareness-planning- control- Evaluation), The results showed that there was a statistically significant difference among the research groups between the averages of the development of systemic intelligence and the benefit of the experimental group. There was a statistically significant difference among the research groups between the averages of developing systemic intelligence and gender and interaction Between group and gender in the development of systemic intelligence and for the benefit of females.

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# El impacto de un programa educativo basado en las estrategias metacognitivas. en el desarrollo de la inteligencia sistémica entre los estudiantes de Ninawa Instituto Técnico

## Resumen

### 5 estrategias

El objetivo del estudio fue identificar el impacto de un programa educativo basado en las estrategias de metaconocimiento en el desarrollo de la inteligencia organizacional en los estudiantes del Instituto Técnico de Ninawa a la luz de las variables del grupo y el sexo y la interacción entre ellos. La muestra consistió en 64 estudiantes de las técnicas contables y financieras y bancarias, (32) estudiantes del departamento de contabilidad. El grupo de control consistió en (32) estudiantes del Departamento de Finanzas y Banca, así como procedimientos de equivalencia en las variables (prueba tribal, edad en meses, género). El investigador ideó un programa educativo basado en estrategias de metaconocimiento con (14) sesiones basadas en las cuatro habilidades de metaconocimiento de acuerdo con la teoría de Sternberg (conciencia-planificación-control-evaluación). Los resultados mostraron que hubo una estadística significativa diferencia entre los grupos de investigación entre los promedios del desarrollo de la inteligencia sistémica y el beneficio del grupo experimental. Hubo una diferencia estadísticamente significativa entre los grupos de investigación entre los promedios del desarrollo de la inteligencia sistémica y el género y la interacción entre el grupo y el género en el desarrollo de la inteligencia sistémica y en beneficio de las mujeres.

## Introduction

The student works hard to keep pace with development, and the pressures experienced by the student, especially at the university stage lead to the inability to agree with the environment, the student is always seeking to achieve its goals, whether these pressures result from the family or study, increased pressure with The technological development and the complexity of life and complexity and the resulting problems that make the student confused.

In view of the objective of the researchers to the psychological reality and

knowledge of students in the university and technical institutes, it was found that the majority of students at this stage have the talents and abilities and different types of intelligences, including systemic intelligence, but unfortunately did not employ these capabilities correctly and the lack of interest by teachers or specialists on the measurement and employment. In teaching for their development, as the loss of the individual's systemic intelligence leads to the so-called spatial blindness and distorting his knowledge and his unawareness of the field to which he belongs.

In the other direction, the researchers believe that most of the advanced educational systems have given great importance to the educational, training and educational programs because these programs have a role in achieving the overall goals of the human personality in its three aspects of knowledge, skills and emotions. Hence the focus is on adopting the concept of knowledge and adopting teaching strategies. To achieve its role in building the intellectual system of students and their ability to practice systemic intelligence, and in a related context and to govern the educational, academic and field experience of researchers in the field of knowledge education tried to employ these advanced views in the treatment of. There is a lack of knowledge and organizational intelligence among the students of the Technical Institute because they are in dire need of such a kind of intelligence through an educational program based on meta-knowledge strategies. The problem of research can be determined by the following question:

"The impact of an educational program based on the meta-knowledge strategies in the development of systemic intelligence among the students of the Ninewa Technical Institute".

research importance :-

Recent decades have seen great interest in cognitive processes and the attention of cognitive psychologists has become the focus of study and understanding of complex cognitive mental processes (Zayyat, 2006: 209), because it is the only way society can communicate with the growing changes of human knowledge. The developed person can dispense with these processes, especially when faced with a problem that he can not solve by the usual behavior (Abdel-Sattar, 2011: 196)

University education is one of the most distinguished educational stages in the society. It is incumbent on it to promote the society to cope with the educational and social changes. The academic future of the university student depends on the degree of its social and academic compatibility with the new academic environment in which it is being studied. The community in which the university student receives his education as well as the acquisition of scientific, academic,

and technical expertise and qualifications, and because the human being is a social being with the ability to deal with different circumstances and respond to the developments of life, Compatibility with the university environment requires a number of special components that make the university environment a good environment for study (Safadi, 2015: 2).

A person who possesses systematic intelligence is a person who has a high ability to understand complex interrelationships and interactions in the systemic environment, and this person has the ability to identify elements that hinder the functioning of the system and the factors that help it (Westerlund, 2004: 24). The behavior here is influenced and influenced, with better performance for the individual, and calls systemic intelligence to be optimistic and positive (Saarinen, et al., 2003: 14,18).

Systemic Intelligence is one of the most recently discovered topics. The term began to appear in 2002, and systemic intelligence is defined as a set of abilities: the ability of the individual to be aware of the components of the system, to understand the relationships of influence and influence among elements of the system, And the ability to explain the role of self in the system as well as the ability to control the components of the system in ways that produce the behavior in the system and develop and improve the system (peaceful, 2017: 57).

Systemic intelligence is a new vision of self as part of a holistic context, which includes a cognitive organization of the individual's perceptions and awareness of his thoughts and actions. He also includes the organization of his feelings and feelings, as well as the integration of them in a holistic context that produces an integrated system. Systemic intelligence also includes interaction between the self-system (with all its experiences and knowledge) And the trends and beliefs of the individual) and the external environment (with all the variables it carries), as this interaction leads to behavioral patterns capable of employing the energies of the individual in line with the variables of the situation, and develop and develop both the individual and the system that deals with them (Zoghbi, 2017: 3), since systemic intelligence It helps to improve the quality of the individual's mental life by providing him with a range of abilities that makes him deal with the environment and society as a system with ease through the proper recruitment of strategies. Systemic intelligence is a sophisticated mental adjustment and a link between the individual's system and the outside world. ) The variables of organizational intelligence and quality of psychological life have an

impact on the life of the university student in general, as this stage is the stage of complete mental and cognitive maturity in which the student goes through the preparation and training for the future, as leaders and educators of future generations, students face many problems Which may be academic or psychological, or social, and lack the sense of life and compatibility with them and their inability to

solve problems, because it requires some sort of intelligence must have a university student (Jassim 0.2018: 4).

Al-Barakati (2018) pointed out that organizational intelligence is one of the most important types of intelligence that contributes to the creation of an effective environment for individuals, contributes to increasing student productivity, and contributes to the increase of individual activity within the community. Systemic intelligence is concerned with individuals' vision of situations and events with a systemic vision, Within the system in a smart way, which helps the learner to develop the level of intelligence (Barakati, 2018: 34).

Students 'use of meta-knowledge strategies increases the students' ability to consciously and consciously control the thinking process. This is a major aspect of the learning process. When a student is aware of his thinking process, he can apply this thinking to similar situations. Knowledge has helped correct misconceptions within their cognitive structure. Studies have shown that students who use meta-cognitive strategies usually have the ability to predict outcomes and goals to be achieved, explain how they progress, understand and plan for their learning Identify the time they need in their education, and have the motivation to learn to satisfy and increase their cognitive development. Meta-knowledge strategies usually take the form of internal conversation within the individual (Shawk et al., 2015: 631).

The meta-knowledge strategies are fundamental to the theory of intelligence and information processing. Sternberg (1986) referred to operational processes in the higher components and performance components of his three-pronged theory of intelligence. Three components of information processing were Meta Components, Performance Components, , And the components of the knowledge components. The higher components refer to the higher settings that are used in planning, monitoring, and controlling the performance of the individual or his mental activities while performing a specific task (Al-Alwan, 2009: 311).

Metacognitive strategies assume that learners can build knowledge and the ability to form models and systems through the interaction in the learning process between past experiences and newly acquired experiences. This interaction leads to the interpretation of information and knowledge through their previous experiences, To build the meaning according to the needs of learners and their backgrounds and knowledge of their interests, and hence the basis of systemic thinking based on the individual's awareness to think about models and systems are clear and aware that they are systems and models and not facts and that he can build and analyze, Basis of Available Representations (Saadi, 2010: 180).

Hence, the importance of the present research is that people who have the strategies of "knowledge of thinking" are able to form internal systems based on past experience, new experiences and the ability to link information and knowledge

through systemic thinking that involves analysis and synthesis. Knowledge is an important element of intelligence as Sternberg pointed out and systemic thinking. It can be said that meta-knowledge strategies have the potential to develop systemic intelligence because systemic thinking precedes systemic intelligence. Systemic thinking is knowledge and information, While the ultimate response to systemic intelligence is through the intelligent behavior of the individual, and the main objective of studying any group of mental abilities is to find useful methods to help develop these mental abilities for the benefit and importance of learners. The importance of current research can be summarized in the following points : -

1. To highlight the role of the meta-knowledge strategies and their ability to develop organizational intelligence through the skill of awareness - planning - control and control - calendar and how to guide the student to use thinking correctly and provide a smart response, and knowledge of the roles of the self within the system.

2- Presenting a proposal for the skills and abilities to be taught so that the learner can employ them in his daily life and how to overcome the new problems which are an obstacle to the learner and avoid going into it without understanding or knowledge.

3 - The current research should be the beginning of the development of the capabilities of the students of the Technical Institute and the role of educational and educational programs in improving the educational, cultural and social level.

Search Goal:

The current research aims to identify:

"The impact of educational program based on the strategies of knowledge in the development of organizational intelligence in the students of the Ninewa Technical Institute in the light of the variables of the program and gender."

Research hypotheses

To achieve the goal, the researchers formulated the following main and subsidiary zero hypothesis:

"There is no significant difference in the level of (0.05) between the average development of systemic intelligence in the members of the research groups depending on the variables of the group, sex and interaction between them."

Terminology

First: Educational program: Has been known by: -

Al-Hamdani (2007)

"Is a series of activities involving the positions of paintings and stories planned in advance to be appropriate to the nature of the sample and their potential for

the achievement of educational changes and behavioral, social and behavioral goals according to the search. (Al-Hamdani, 2007: 9)

Al-Akidi (2017)

"A set of experiences, lessons and activities planned and built on the basis of scientific and theoretical students through the positions of stories and educational lessons, which can contribute to the development of mental processes and knowledge to them." (Al-Akidi, 2017: 27)

Second: Meta-Knowledge Strategies:

Sun, Lihua (2013) (Sun, Lihua)

They are ideas and activities that help learners to think about their own learning process, develop a learning plan, monitor how and how to learn, and evaluate results by using strategies to become well-educated. (Sun, Lihua 2013: 204)

Ingol, M & Shefali (2014)

It teaches people what they know, understands what they need for a particular task, how they learn, how to use their current skills to learn what they do not know, and identify strategies for the task. Then implement the strategy (Ingole, M & Shefali, P, 2014: 85)

The researchers define the student's ability to be aware of the knowledge he possesses within his cognitive structure, to think about what he thinks, to monitor his progress, and to be able to control the information by managing his thinking system, evaluating the performance and activities in which he adjusts the plans he sets for himself in order to reach the goal As soon as possible

Third: Systemic intelligence: It was known by: -

Hamlanen and Sarnen (2004)

As intelligent behavior in complex contexts and systems that involve interaction and feedback, that the individual perceives himself as part of the whole, and perceives the vulnerability and influence of these systems.

(Saarinen, E. & et.al, 2003: 9)

Rani (2007)

As a behavioral efficiency and is intended to act intelligently with complex systems involving feedback and interactions. (Ranne, R, 2007: 1)

Full (2010)

As the system of performance of complex systems, such as the brain system, scientific systems, and includes complex systems complex, seeking to build the work as a team. (Kamel, 2010: 64)

The Elephant (2015)

"As a set of capacities which is the capacity for systemic awareness, systemic integration, systemic control, and systemic development, which leads the individual to improve his / her life"

(The Elephant, 2015: 32)

Jassim (2018)

"That the process of performance in which the learner employs his skills and abilities in the areas of performance based on those abilities and skills." (Jassim, 2018: 11) The definition of systemic intelligence in theory: The ability of the individual to be aware of the field in which it is located and interact with its parts to reach a state of total integration and impact and influence through feedback, which helps the individual to control the field and develop it to improve the life of the individual.

The experimental procedural definition of systemic intelligence: the degree to which the student of the technical institute is to test the systemic intelligence in the tribal and post-test.

Theoretical framework and previous studies

This axis includes the following two areas:

Metacognitive strategic strategies

The skills of the meta-knowledge are the most recent topics of psychology, and they are not new. James and Dewey describe the processes of knowledge as containing self-reflection through the processes of "learning and thinking." Kaniel (1998) Knowledge is due to the "complex thinking processes" used by the learner during his cognitive activities, while Livingston (1997) considers them to be of high-level thinking, which includes "active control of cognitive processes", namely task planning, , And the concept of knowledge and entered into the fields of psychology The first to suggest the term metacognition at the beginning of the "seventh decade" of the "twentieth century" when he presented in his research on the study of memory and beyond memory (Memory & Met) memory through evolutionary psychology through his experiments, which revealed that children rarely observe their memory, understanding, and other cognitive things, and that they have complete limitations in the skills of knowledge (Akasha, and Iman, 2012: 114).

Nolan (1994) stated that meta-knowledge strategies are one of the fields of knowledge that play a prominent role in the development and advancement of the "educational process." It focuses on the learner's ability to plan, monitor and evaluate his / her own learning, Improve their learning processes, "and encourage students to recognize and think in their own thinking so that they become more effective, educated, purposeful and independent (Jassim and Faten, 2013: 337).

(1977) that the meta-knowledge strategies are of a kind that relate to awareness of knowledge or cognition (meta cognition), which means awareness of, and control over, cognitive processes in which man controls, including the knowledge of memory (met memory) to mean awareness of strategies Memo

ries and things remembered, controlled and controlled by the individual, such as understanding comprehension, attention attention, and meta thinking.

Alexander et al. (1995) and Carr et al (1996) note that meta-knowledge studies and research have focused on three attributes:

1. What do students know about thinking strategies?
2. Can they use these strategies?
3. Can they monitor their knowledge processing?

(Sousa, 2006: 48)

### Systemic Thinking and Beyond-Knowledge Strategies

The skills of "higher thinking" are concerned with the application, analysis, conclusion and understanding of relations and arrangement. The main characteristics of systemic thinking are:

- 1- Issuing complex or multiple solutions.
- 2 - make conclusive judgments and give specific views.
- 3 - needs multiple standards or measurements.
- 4 - needs a great mental effort.
- 5 - establishes a real meaning of the situation.

This is in line with what was stated at the 10th Conference of the National Center for Educational and Development Research that "higher thinking skills" occur when a person receives new information stored in memory and then interacts or arranges and evaluates this information to achieve the goal. As systemic thinking is an analysis of the educational situation And the re-installation of its components in multiple ways with the achievement of the goals and access to what is required in the framework of the organization and management of the process of thinking, which can be seen as "the thinking in which the individual is aware that he thinks in clear models and have the ability to build and analyze," can be considered systemic thinking Is a form of higher levels of thinking, where through this pattern the individual is able to "vision of the future" of any subject without losing the subject elements, that is, the transition from the individual thinking specifically to the comprehensive thinking, which makes it look at many of the elements that deal with it As divergent themes which he sees as common in many respects, in the sense that objects are viewed with a systemic perspective (Rizuqi, Suha, 2015: 437-438).  
Sort Sternberg Sternberg theory

The Sternberg theory, known as the "Trochaic Theory of Intelligence," confirms postmodern operations as one of the main components of intelligence. It is seen as an operational process that controls other components of intelligence, especially cognitive components, and Sternberg believes that Cognitive knowledge processes are primarily responsible for planning the implementation of a task, ensuring that it is properly implemented, monitoring the proces

ses and knowledge activities, and finalizing the results.

Sternberg stresses that cognitive processes in time control all cognitive components. They receive feedback from these components. Sternberg pointed out that meta-knowledge strategies are the critical factor in intelligence, because the ability to identify the sources of knowledge required is appropriate to make decisions about How, when and why should a task be accomplished? Is the important factor in intelligence (Zaghloul, Emad, 2009: 83) Sternberg (Sternberg 1985-1988) defined the meta-knowledge into three main skills:

1- Planning skill: which can be applied in the following cases:

- When defining a set of goals or goal.
- When the individual feels that there is a problem, and work to determine its nature.
- When selecting the implementation strategy and skills.
- In order of sequence of operations or course of performance steps.
- When identifying potential obstacles or errors.
- When identifying methods to address multiple difficulties or obstacles.
- When predicting expected or desirable results.

2 - Control skill (control and control): It can be applied in the following areas:

- When the target is retained at Focus or Interest.
- When maintaining the sequence of processes or the course of performance steps.
- When determining when to achieve sub-goals.
- When you schedule the transition to the next task or steps.
- When selecting the appropriate process or step that comes into context.
- When obstacles, difficulties and mistakes are detected.
- When choosing a strategy to overcome obstacles or eliminate errors.

3- Evaluation skill: It is applied in the following cases:

- When assessing the extent to which the goal is achieved.
- When judging the accuracy and adequacy of the results.
- When evaluating the appropriateness of the methods used.
- When assessing the process of addressing difficulties or obstacles.
- When assessing the effectiveness and implementation of the plan.

(Al-Ayasra, 2015: 110)

4 - Skill of awareness: These three skills are added to the skill of awareness, and the skill relates to the awareness of the level of awareness of the individual and his awareness, abilities and level of attention, it means that the individual is aware that his work is true or incorrect, and this skill requires doing some work, The awareness and awareness of the required work and responsibilities, the awareness of the interrelated relations between these works, the awareness

of the mental processes that he uses to address them, and awareness of what is in his memory of knowledge and previous experience and information related to the current task and awareness of the level of success in the performance of the task entrusted with it.

(Najjar, Amal Muhammad, 2015: 301-302)

The Sternberg classification has been adopted in the preparation of the program as well as the skill of awareness as one of the most important skills beyond memory and thinking skills. The Sternberg theory is a tool for linking intelligence and meta-knowledge and thinking strategies. Meta-knowledge strategies are an essential component of intelligent performance, Input, information and response to these inputs in complex and interconnected situations, and cognitive processes emphasize their role in raising intelligence. The researchers also adopted a set of strategies in program performance, including self-questioning and the Think-Zug-Sharek strategy. Strategic self-table.

#### Systemic Intelligence

The word "intelligence" appeared at the hands of the Roman philosopher Cicero, a Latin word meaning "Intelligentia" and "English", meaning "Intellect" and "Understanding" and then translated in Arabic into intelligences (Ghanim, 2011). : 1), and the successive developments in understanding the various aspects of intelligence, and with the development of understanding of the growth of intelligence and the possibility of development, has emerged in recent years, the jurisprudence based on modern approaches to intelligence, especially cognitive and cultural inputs, and aims to deal with a range of abilities and aspects of intelligence, There were many theories of intelligence as the theory of "intelligences Howard specified Kardner Gardner "triple intelligence or successful intelligence Robert Sternberg" Sternberg "(Ghanem 2015: 3).

Mayer, Roberts and Barsade (2008) argue that the types of "intelligence" that will be discovered after Emotional Intelligence can help predict some of the outcomes of people's academic-social life, (2010). Systemic intelligence is one of these intelligences (Rauthmann, 2010: 41). The system is defined as the structure of a set of interrelated, interdependent and integrated elements and components interacting with one another and influencing each other in order to Perform functions and tasks whose final result is to achieve the desired output The system clearly presents the internal relations between different parts and components on the one hand and the relations between them and the system as a whole on the other, and the system falls within certain limits within an environment that surrounds and is affected by them (Sevin, 2017: 227).

The origins of Systemic Intelligence SI were born into scientific efforts and serious research that had a role in all branches of science in general, such as

sPeter Senge (1990-1994-1999), Farouk Fahmy & Lagawsky (1999) 2002-2004) and Essa Saarinen and Raimo Hämäläinen (2004-2002) (Kamel, 2010: 483).

Hamlingen and Sarnin (2007) point out that the starting point in the emergence of systemic intelligence through the five systems of Singh (1990-2006) and the introduction of systemic intelligence on the self-mastery referred to by Singh and Systemic Intelligence (Systemic Intelligence) Personal empowerment "(Hämäläinen, & Saarinen, 2007: 41).

Although there are many studies that have laid the theoretical foundations of systemic intelligence, the need for empirical studies in systemic intelligence (Rauthmann, 2010: 6)

"Systemic intelligence as a theory is based on the belief that some individuals have an innate ability to work effectively in other systems, that individuals have the potential to trigger positive systemic changes, and that it is based on the idea that intelligence can be developed and improved," Joneskorner (2011) How individuals respond to feedback in a way that fosters successful interaction, organization, and behavior modification (Anzi, India, 2018: 16).

Systemic Intelligence is the most recently discovered type of intelligence. In 2002, the concept of Systemic Analysis Laboratory was published at the University of Science and Technology at Alto University, "Systemic Intelligence" as an interface between Holistic Orientation and human control that sheds light on human potential (Hämäläinen, & Saarinen, 2007: 4).

In the view of the researchers that the abilities of systemic intelligence helps people to interact and learn better, since the individual can not live apart from the system or separate from it, the work of the system lies in the size of inputs and the extent of interaction that results through the impact and impact regardless of the type of the system, whether environmental or educational or Social, affect and affect the thinking of the individual and the speed of intuition, and understanding the requirements of the system and rules and identify the negatives and positives through the process of control and systemic control in order to reach positive results and bring development and change in a positive direction, The main intelligence systematization died, as follows: -

1. Systemic structure.

Adaptive structure.

3- The periodic and chronological table of structural development.

4. Rules of adaptation and learning.

5. Organization of knowledge and logic in memory. (Jassem, 2018: 28)

McNamara (2006) points out that systemic thinking is a means of helping the individual to see the system from a broad perspective that includes a broad

vision of the system's structures, its different patterns and the role of the system, rather than seeing only certain events in the system. The real causes of the problems of the system and the exposure to an appropriate starting point to address them, McNamar (2006) believes that systemic thinking has helped produce many principles and tools to help individuals analyze and change the system (Elephant, 2013: 64).

Models of systemic intelligence

The model of Hämäläinen & Saarinen

1. Systemic perception - our ability to see the systems around us.
2. Effective response - the individual's talent for making the right decisions at the right time
3. Positive integration - our ability to think about our thoughts and think about our thinking.
4. Effective discovery - emotional engagement with ideas.
5. Meditation - the ability to feel and organize.
6. Positive attitude - the individual's approach to life and order.
- 7 - the wise act - our ability to act understanding under a time frame.
8. Harmony (harmony) interaction within the system positively  
(Hämäläinen, & et al., 1014: 19)

Elephant Model (2015)

"Systemic intelligence" is a set of capacities, which consists of the ability of systemic awareness, systemic integration, systemic control, and the ability of systemic development. The elephant sees "systemic intelligence" leading the individual to quality of life. The elephant has identified four abilities of systemic intelligence:

First: "The capacity for systemic awareness" includes: awareness of the components of the system, awareness of the relationships of influence and influence among the components of the system, continuous feedback among the components of the system.

II. The ability to integrate systemically and include: "vision of the self" within the system, "" see the roles of the self within the system. "

Third: "The ability to system control" includes: the identification of new methods of "behavior-producing" within the system, control of the system, performance of "behavior-producing" patterns in the system.

IV. "The ability to develop the system" includes: Supporting the intelligent behavior of the system, system attention and maintenance, the vision of the problems facing the system, and the development of the system (elephant, 2015: 59-60).

Previous studies

After reviewing many of the previous studies related to the variables of research as they were classified on two axes:

First: Studies related to meta-knowledge strategies

Al-Alwan and the invasion (2007)

The study aimed to identify the "effectiveness of a training program for the skills of the knowledge of the development of critical thinking skills among university students." The sample of the study included students of Al-Hussein Bin Talal University in the faculties of Arts and Sciences. The study sample consisted of 72 students (male-female). The experimental group reached (36) male and female students. The control sample was (36) students. The results reached the effect of the program in the development of critical thinking in the study sample for the benefit of the experimental group. , Level of study, college). (Al-Alun, Al-Ezzo, 2007)

The study of Qaisi and the memory of (2009)

The aim of the study was to identify the impact of the meta-knowledge strategies in solving problems among the students of teacher training colleges in Kirkuk education. The research society reached 924 students with 577 students and 347 students. (25) males and 25 females as experimental group and 25 males and 25 females as control group. The results showed a statistically significant difference in favor of the experimental group to which the program was applied.

Abu Shraikh study (2016)

The study aimed to identify the "effectiveness of a program based on the strategies behind the cognitive achievement in the development of creative and strategic thinking skills and self-intelligence among the students of the Islamic culture course at the University of Jerash, Jordan." The sample consisted of (98) students were divided into two groups: (18,19). The highest mean of strategic thinking (Orientalism) came with an average of (18,30). The highest mean of self-skill (skill Self understanding) with an average sense (17,76) (Abu-Rish, 2016).

Second: Studies related to "systemic intelligence"

The Elephant Study (2013)

The study aimed to identify the effect of "the design of an electronic course in psychology based on the principles of the theory of cognitive flexibility and its impact on the development of systemic intelligence and reduce the cognitive burden of students of the Faculty of Specific Education, Alexandria University." The sample of the study consisted of (66) female students (34) (32) as a control group, and the researcher prepared the four-dimensional "system intelligence scale" (Systemic Awareness, System Integration, Systemic

Control, Systemic Development) and (36). The results showed statistically significant differences between the average scores of the two groups Experimental and remote measurement control Intelligence systematization total aggregate for the experimental group (elephant, dream, 2013).

#### Core Study (2015)

The aim of the study was to learn about the effectiveness of the FPSP program in the development of both organizational intelligence and collective creativity skills among the students of the College of Kindergarten. The sample included 100 female students from Alexandria University, Faculty of Kindergarten, The results of the study

indicated that there were statistically significant differences at the level of (0.01) between the scores of the tribal measurement and the post-measurement of the scores of the students of the experimental group in the system intelligence test for the benefit of telemetry (core, 2015).

#### Al-Barakati Study (2018)

The study aimed at identifying the extent of the effectiveness of the ring house strategy in developing the organizational intelligence of Rothman and the academic achievement of the female students of mathematics at Umm Al Qura University. The researcher applied to the original community of (64) female students and they were divided into two groups, experimental and female (32) (32) students as a control group. The results indicated that the effectiveness of the ring house strategy in developing the organizational intelligence of Rothman for the benefit of the members of the experimental group (Al Barakati, 2018).

#### Method of Research

The current research aims at the impact of an educational program based on the meta-knowledge in the development of organizational intelligence in the students of the Ninewa Technical Institute. The methodology to be followed in the research procedures is the experimental approach as follows:

First: Determine the research community Population of Research

The research community included the students of the Technical Institute / Nineveh for the academic year (2018 - 2019) of (870) students.

Second: Selecting the Sample of the Research: Sample of the Research

A total of 64 male and female students from both departments were enrolled in equal numbers with 32 students as experimental group and 32 students as control groups.

Fourth: Experimental Design

Experimental design is applied with experimental and control groups. Two

groups, one experimental and one control, are used. The experimental group is exposed to the causal independent variable and the control group is left unaffected. At the end of the experiment the results of the two groups are measured for the phenomenon called the dependent variable , 2000: 143).

Seventh: Research Tools:

#### A - Systemic intelligence test

Systemic intelligence is one of the most recent topics. The current research requires a ready-made test that is compatible with the Iraqi environment and the research sample. The researchers consulted a group of experts and arbitrators in the field of educational psychology and, through a series of studies, Most of the studies reviewed have adopted views, because there is no specialized theory of systemic intelligence, as the capacities identified by the elephant (2015) have been adopted as shown below:

1 - The ability of systemic awareness: "Awareness of the components of the system and awareness of the relationships of influence and impact among the components of the system and awareness of the continuous feedback between the components of the system."

2. The ability to integrate the system: "the ability to see the self and the roles of the self within the system."

3 - The ability to control the system: "Identify the methods of producing behavior in the system and control of the system, and the practice of productive methods of behavior in the system.

4 - The ability to systemic development: "Supporting intelligent behavior systemically and attention to the system and maintain it and see the problems that face the system and the development of the system." (Elephant, 2015: 59-60)

#### Formulation of test paragraphs

After determining the areas of systemic intelligence according to the model of the elephant dream, which was adopted in the construction of the test paragraphs, 36 (procedural position) statements were constructed expressing multiple attitudes in life. The four abilities of systemic intelligence include (9) paragraphs per capacity, (3) Three alternatives, one of which is the correct answer, which represents the systemic intelligence and gives (one degree) for the correct answer and (zero) for the wrong answer, and the test instructions were set and how to answer them.

#### Eighth: Psychometric Properties of Test

##### Virtual Validity (Scale Validity):

The characteristics of psychometric in psychological and educational research are used as indicators of the accuracy of standards, as the extraction of honesty and consistency of the most important characteristics (Shaughnessy & et.al.,



2012: 168), the test was presented to a group of experts and arbitrators in the field of educational psychology, An agreement reached (80%) of the opinion of the commissioner as (3) paragraphs were deleted and the scale became (33) paragraphs, as well as amendments proposed by the experts.

#### Construction Validation:

The validity of the building included extracting the discriminating force of the test and the internal consistency of the test paragraphs through the relation of the grade of the paragraph to the total grade of the test. The test was applied to a sample of 180 students. After correcting the test forms and sorting the data from top to bottom, (49) students and the minimum (49) students. Accordingly, the total number of applications that were subjected to the statistical analysis (98) form, the results showed that paragraph (32) is not Characteristic of the capacity to be measured, being deleted Bh test (32), paragraph, and to calculate the degree of each paragraph correlation coefficient college degree test, pulled a sample of discrimination itself forms and subjected to statistical analysis and then use the equation of Pearson correlation coefficient in order to find a correlation between the scores of each paragraph with a total score of the test.

#### II. Reliability of the test

Stability was obtained to test systemic intelligence in a retest method. The stability coefficient (0.81) was obtained by using the Pearson correlation coefficient. In addition, the stability was obtained by dividing the test segments into pairs and individual. (0.72). When the Spearman Brown equation was applied, the stability was 0.83.

#### Sample the final application of the test

(215) students from 271 students divided into three divisions for each department, in order to identify students with a decrease in Systemic intelligence capabilities and their subordination to the system intelligence development program.

After completion of the test, the grades obtained from the application of the pre-test were sorted and the number of students who received grades below the satisfactory average was examined. The sample of the study was 38 students from the accounting department and 35 students from Financial and banking techniques for obtaining grades below the satisfactory average of 16 years.

After the diagnosis of the pre-test forms, the students were divided into two equal groups, the first being experimental and the second being an officer. This process was conducted by organizing the data in the form of equal pairs. 32 students were selected from the accounting department as a pilot group, 32 were students from the Department of Finance and Banking As a control group and Table (1) shows this.

#### Table (1)

group	Females	Male	Total
Experimental	17	15	32
Control	15	17	32
Total	32	32	64

### Parity between research groups

In order to achieve the research objectives, the researchers performed a parity between the research groups and ensured equivalence of multiple variables. The parity between the experimental and control groups was carried out in the tribal test by the pairing of the test. The gender parity was also performed, as was the equivalence of the student's age. The age of the two groups was calculated in months. The alpha values calculated at the pre-test and age variables were less than the numerical value of the table and the same situation at the sex variable in the square test. Thus, equivalence In the three variables.

### Educational program

An educational program based on meta-strategies was developed based on the four skills identified by the world of Sternberg (Awareness, Planning, Control and Control - Calendar). The program consisted of 14 sessions of three sessions each, as well as an opening session and a closing session, In order to verify the validity of the program, the following steps have been taken:

#### A - The educational program is valid

The sessions of the program were presented to a number of experts (32) as well as to their views at each session of the program and the suitability of the sessions to develop organizational intelligence and modify what they deem appropriate and to add or delete any session of the program. The experts and arbitrators in education and science And their opinions and observations about the sessions of the program has been made some minor amendments and the program got the proportion of agreement reached (93%).

#### B) The exploratory experience of the educational program

The program was implemented on a sample outside the basic application sample and on the students of the first stage of the computer department on 17-18 / 10/2018 with two sessions. The purpose of the application of this session was as follows:

1. Know the feasibility of applying the program and the difficulties that researchers may face during the implementation of the program.
- 2 - Identify the necessary time required for each session during the application of the program and found that each session requires between (50 - 60) minutes,

which is equivalent to a lecture from the lectures of the Technical Institute.  
 3 - to identify the extent to which students understand the sessions of the program and their desire to the content of the session.  
 4 - Knowing the appropriateness of examples, stories, judgment and questions within the session.

Statistical means:

The researchers used the statistical package for social sciences (SPSS) in the extraction of the results of the research and the statistical means used by the researchers (square Kay, Pearson correlation coefficient, the test of the analysis of one-way and two-way interaction).

View and discuss search results

After collecting the data for the members of the research sample and statistical analysis, the results will be presented according to the main zero hypothesis as follows:

The main hypothesis:

"There is no significant difference in the level of (0.05) between the average development of systemic intelligence in the members of the research groups depending on the variables of the group and gender and interaction between them.

To investigate this hypothesis, the arithmetical averages and standard deviations of the members of the four research groups were extracted in the development of systemic intelligence and Table 2 shows this.

The mean growth rates in the systemic intelligence of the four research groups were presented as polygonal columns as shown in figure (1).

Table (2)

The arithmetic averages and standard deviations for the development of systemic intelligence among the four research groups

standard deviation	SMA	number	Gender	the group
1.83085	5.0667	15	Males	Experimental
3.03896	7.8824	17	Female	
2.88419	6.5625	32	All experimental	
1.62245	1.4118	17	Males	Control
0.98561	1.4000	15	Female	
1.34066	1.4063	32	All control	
2.51126	3.1250	32	Males	Total Gender
4.00088	4.8438	32	Female	

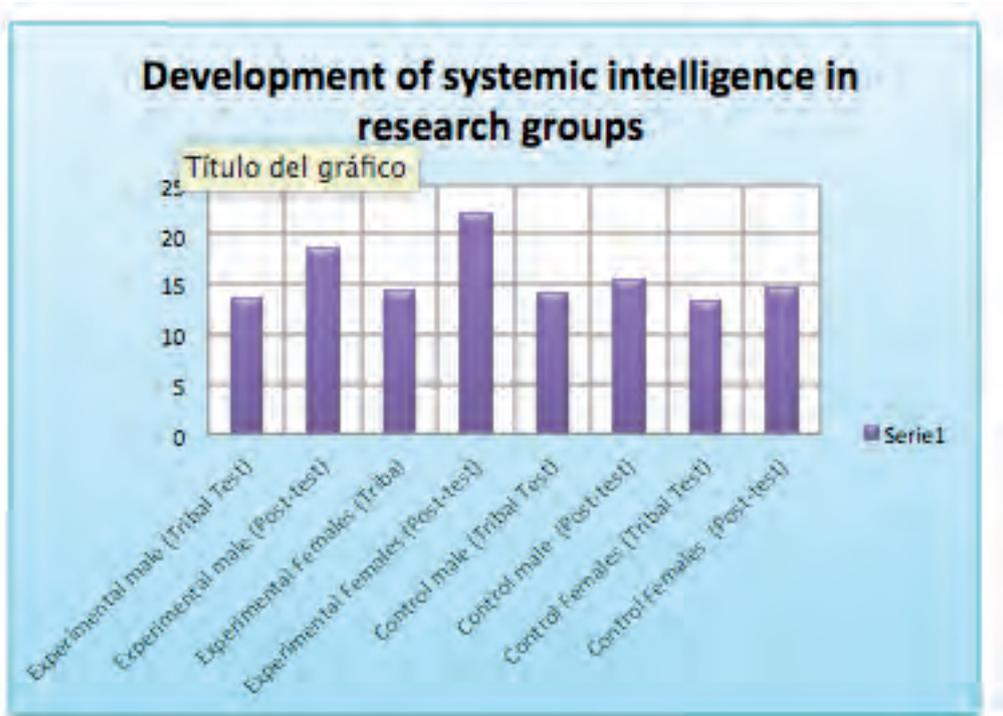


Figure (1) shows the growth of the four research groups

In order to test the three sub-hypotheses, the researchers applied the ANOVA-2WAY analysis and the table (3) shows that

Table (3)

Results of the analysis of the binary variance of the growth averages of the systemic intelligence of the members of the research groups according to the variables of the group and gender and the interaction between them

Level of significance	F		Mean squares (MS)	Sum of squares (SS)	df	Source of Variance
	Tabulated (Sig.)	Calculated				
There are differences	4,000	98,105	409,450	409,450	1	Group (Gender)
There are differences	0,05	7,506	31,325	31,325	1	(Gender)
There are differences	0,1	7,632	31,853	31,853	1	(Gender)
			4,174	250,416	60	Within Group (Error)
				723,044	63	Total

To verify the first sub-hypothesis, the value of (F) calculated at the program variable was 98,105, which is greater than the value of (F) of the scale of (4,000) at the level (0,05) and the degree of freedom (1, 60) The results of the educational program variable ( $\eta^2$ ) reached (0.566). This means that there is a statistically significant difference among the research groups between the averages of the development of organizational intelligence and the benefit of the experimental group (the educational program), thus rejecting this null hypothesis and accepting the alternative hypothesis This result was agreed with the results of the study of: Alwan and the invasion (2007) and Qaisi and the memory (2009) and Abu Shrikh (2016).

The researchers attributed the first result related to the group variable, which is attributed to the first zero hypothesis, to the effectiveness of the educational program designed for research purposes through its steps based on the strategies of knowledge and skills which are in (awareness - planning - control and control - calendar) More effective and active within their cooperative group, which enabled them to dialogue, debate, freedom of opinion, exchange ideas and ideas and express their feelings freely as well as their self-efficacy by giving importance to their roles through strengthening and nurturing This is a demonstration of the role and skill of the four meta-knowledge strategies in the development of systemic intelligence and an emphasis on previous studies, such as Hamlin and Sarnin (2007), on the role and effectiveness of meta-knowledge strategies and their ability to develop systemic intelligence.

The result of the sex variable shows that the calculated value of  $F$  (7.506) is greater than the value of  $F$  of the scale (4000) at the level of significance (0,05) and the degree of freedom (60.1). Table (3) The results of the educational program variable ( $\eta^2$ ) were obtained by (0.043). This result showed the effect of gender on the development of the abilities of organizational intelligence and for females. This result was agreed with the study of: Elephant (2017), Juhri (2015) and Brakati ), And the results are attributed to the ability of females to have a focus on the subjects and the realization of the details and possess the ability to retain as they are more tenacious and committed, although this is based on their ability to Ast And the ability to employ their abilities to develop their skills on the systemic awareness, and enable females in the experimental group to integrate and affect the impact and influence within the cooperative group to which they belong and to highlight themselves and knowledge of their roles, and how to deal with the obstacles in front of progress, and correct their mistakes After having acquired the experience in accomplishing what is required of them and what they want and how to reach their goals, and that the benefit of the girls from the role of feedback increased the information they received as a result of the performance they gave and their knowledge of what is true and what is wrong, They are to self-manage in a positive way and benefit from the experiences of others and their experiences in life.

The result on the variable of interaction between the variables of the educational program and gender showed that the calculated value of  $F$  was 7.632, which is greater than the numerical value of the table (4,000) at the level of (0,05) The results of the educational program variable ( $\eta^2$ ) were obtained by reaching (0.044). This result was indicated by the interaction between the group and the sex. This result was agreed with the study of al-Qaisi and the males (2009), elephants (2017) And Barakati (2018) in the development of the abilities of systemic intelligence in the members of the research groups, and the result is due to the positive interaction of the proposed educational program with gender variable The program's steps, based on knowledge-based strategies that are consistent with its awareness, planning, monitoring and control skills, and are consistent with the systemic intelligence capabilities of female students, are able to create systemic awareness and capacity. On systemic integration and capacity for systemic control and systemic development have helped to develop these capacities. The majority of the studies also dealt with the gender variable in favor of females as well as other experimental variables. This gives a positive indication that the educational programs related to cognitive abilities are more responsive to female students in order to harmonize with the female personality.

### First: Conclusions

Through the current research results, the researchers came up with a number of conclusions:

1- The effectiveness of the proposed educational program in the development of organizational intelligence among the students of the Ninewa Technical Institute.

2 - Students are more interactive and responsive to the proposed educational program in the development of their abilities of systemic intelligence.

### Second: Recommendations

From the above conclusions, the researchers recommend the following recommendations:

1 - Instructing the teaching of technical institutes to focus on the skills of organizational intelligence through their teaching of scientific, humanitarian and support materials.

2. Instructing the Directorate of Preparation and Training in the Directorate General of Education in Nineveh Governorate to organize joint training courses with the Ninewa Technical Institute to train the students of the Technical Institute to acquire and develop the capabilities of organizational intelligence.

### Third: Proposals

To complement the current research, the two researchers propose the following future studies:

1 - The impact of a proposed educational program to teach the technical institute based on the abilities of systemic intelligence in the development of the skills of the knowledge behind the students.

2 - The impact of educational program based on the capabilities of systemic intelligence in the development of knowledge flexibility among university students.

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