The effect of teaching quality in developing scientific concepts in chemistry in light of the systemic approach among female students of special education at Umm Al-Qura University in Makkah

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Abstract:

The Study: Looking forward to the effect of teaching quality in developing scientific concepts in chemistry in light of the systemic approach among female students of special education at Umm Al-Qura University in Makkah**.**

The study aimed to verify the impact of the quality of teaching on the development of scientific concepts in chemistry in the light of the systemic approach among female students of special education at Umm Al-Qura University in Makkah, and a list of scientific concepts included in the course and a guide for teaching them was identified, then building a research tool, which is a test to measure scientific concepts, and the semi-curriculum was used Experimental, on a sample of (80) female students of the course. The results resulted in statistically significant differences at the level of significance (α 0.05≥) in favor of the experimental group students. The study recommended expanding the use of the systemic approach in improving students 'understanding of the scientific concepts included in the general chemistry course for special education.

Key words: Systemic approach - Scientific concepts –Chemistry- special education

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variables and concepts overlap phasizes limiting the culture of memory and focusing on developing thinking and dealing with complex situations in whic (Abdel Sabour, 2004). The systemic approach is considered one of the contemporary approaches that has met with great demand in terms of studies and conferences, including the study (Zaitoun, 2001) in his book The Design of Teaching a Systemic Vision, and the Study of the Pope (2008) a computerized program using the systemic approach to develop and maintain scientific concepts. These studies seek quality in content, teaching strategies, methods, and thinking processes that develop among students. Therefore, universities, including Umm Al-Qura University, have been striving to improve the quality and efficiency of university education since the year 1432 AH, and quality assurance units have been established in all colleges and departments in order to ensure the advanced level of knowledge and services in them. This change requires an administration that can keep pace with it and invest all the human and technological energies to

Introduction Contemporary society is witnessing today a great scientific and technological revolution, which made the learning process facing challenges that call for reconsidering all its components. From here comes the development of education considering that its ultimate goal is to develop thinking in a way that allows the student to be able to achieve it, and the approaches of teaching are among the components of the education process to meet these challenges, the most important of which is the systemic approach in teaching as a determinant on which the discussion between the teacher and the learner is based, as well as used as a teaching tool, to facilitate content In a functional and meaningful way, which leads to obtaining positive results for the teaching process, and is used in the process of linking the different parts of the curriculum to each other and linking it to the previous stages, and helps to develop the spirit of cooperation between the learner and the teacher, and helps teachers to become more effective and efficient in teaching, The systemic approach also em h many

the systemic approach to teaching and learning. The center's experts prepared some educational units in the various branches of sciences according to this approach. Some of these units were applied at the university level and proved to be effective in teaching, and at the level. Global, where some programs have been prepared to develop science and technology education using the systemic approach in some US states, for example: the (MSSI) program in Montana, the Arkansas State Program (ASSI) Arkansas Stste Wide Systemic Initiatives and the Illinois State Program in Chicago (CSI) Chicago Urban Systemic Initializes (Najdi, 2006). Interest in the systemic trend has also increased in the Arab world, as several Arab conferences were held on the systemic approach in Cairo, some of them in cooperation with Jordan for the period between (2001-2006), namely: The first Arab conference on the trend to use the systemic approach in teaching and education, which was held in Cairo in (February 2001), then followed by the second Arab conference in (February 2002). One of its most important recommendations was to include the systemic approach to teaching and education in general and science in particular, and in the educational qualification courses to prepare university teachers and administrators Then followed by the third conference in (April 2003), which was organized by the Center for the Development of Science Teaching in cooperation with Jerash National University in Jordan. The fifth conference at the League of Arab States in (April 2005) was about developing the education system in the Arab world and the sixth conference was about sustainable development in the Arab world in (April 2006) One of his most important recommendations is to expand the use of the systemic approach in general and science in particular, to benefit from successful experiences and to activate the role of systemic thinking (Al-reach the required form to achieve the desired goals of university education and to develop the higher thinking skills of the university student using modern teaching methods, strategies and approaches that serve the characterization of new courses according to specialization, as in the general chemistry characterization of special education. The programs and courses of science in general and chemistry in particular Arab and international have received special attention and great attention, especially for non-specialists, and this aspect needs a systemic approach to design the vocabulary of the course as one unit that helps to understand the whole instead of entering into the detailed components in terms of organizing the content and methods of thinking to teach it, evaluate it and its close connection By specialization, the system in its essence means the existence of a self-integrated structure whose components are interdependent and interdependent as a spider-web structure (Al-Kubaisi, 2015, 15-16), as the non-specialists do not have sufficient scientific backgrounds to study and know various scientific phenomena and information. (Abu Ajwa, 2009) pointed out that the teaching of chemistry is of great importance in its applied value in our contemporary life, as it is the most important science that has contributed to the development and change of human life and deals with materials that consist of elements and compounds that have composition, properties, interactions and transformations that meet human needs. Contributes to all activities of life. This importance is evidenced by the attention paid by the Kingdom of Saudi Arabia represented in its general and university education to this branch of science in line with the process of development and improving the quality of education in pursuit of inclusive growth for all.

After the fourth conference (2004), the Science Teaching Center at Ain Shams University adopted

with the requirements of the times In light of this dealing with general chemistry concepts for special education, this current research was presented.

The study Problem: Despite the importance of the chemistry course in life, teaching it to special education students differs from teaching students in other majors, because some of them did not study it at the secondary level. Many countries of the world have been interested in providing academic programs based on a set of standards, which led to educational leaders seeking to make more efforts to improve the quality of the educational output, but students are still indoctrinated with information in the required courses without considering the link between their vocabulary and specialization, so what our students learn becomes just a heap My knowledge is not collected by an integrated system that achieves their comprehensive vision of the course and specialization. In terms of preparing special education teachers, a special council has been established in the United States of America to undertake the task of preparing standards for exceptional children (Council For Exceptional Children 2001) (CEC and the National Council for Professional Teaching Standards, 2008). (() NBPTS with the aim of raising the level of competence of special education teachers, and developing a special guide for redesigning special education programs and in conformity with quality standards. Therefore, universities that have special education teacher preparation programs are keen to increase the effectiveness of preparing their teachers at the undergraduate level, by focusing on courses Specialized, educational, scientific, use of e-learning and developing a plan to determine levels that include the set of knowledge and skills that teachers should be able to master and master before service and train them during service in a way that facilitates the practice Kubaisi, 2015, 21-26). This reflects the extent to which scientific centers have adopted this approach. The systemic approach emphasizes the focus and development of systemic thinking among students and dealing with complex situations in which many variables overlap, so that the student is able to have a comprehensive, interconnected and integrated future vision for any topic. Both (Fahmy and Al-Bar, 2002, 9 and Al-Kubaisi, 2015, 31-32) argue that there are many justifications for using the systemic approach in teaching and learning, the most important of which are: - The knowledge explosion extending all over the world. - Increase the speed of scientific and social development and the speed of transferring information via the Internet. - Attention to filling the mind of the learner with the vast amount of knowledge at the expense of quality, which leads to boredom of the learner. Focusing on memorization and indoctrination in the educational situation and examinations without linking what he learns and what he has of knowledge, and the student's failure to retain information. - An explosion of knowledge that extends to all parts of the world and affects all individuals and cultures. The imposed environmental problems that threaten living organisms. The weakness and complexity of the current curriculum system and the lack of coherence and integration lead to the weak personality of the student and his inability to solve his daily and future life problems. In view of the shortcomings in the quality of the description of a general chemistry course for special education in the College of Education, this may lead to a deficiency in the outputs of university education as it is a general decision for them and is due to their previous knowledge of it for those of his scientific specialization, and in order to achieve international quality in educational outcomes and to achieve educational renaissance to keep pace

information in problem-solving situations, and that is through the use of the systemic approach that has proven its effectiveness in Achieving the goals of teaching chemistry (Salama, 2004 and Nour, 2007). Sundberg and Dini, 1993 & Lawson, etal., 1990, confirms in their studies in America and their observations on students who study the biology course for non-specialists in science, it was found that: - Some students have a lack of understanding and knowledge of the important scientific concepts of the biology course, and they do not have interest in understanding the scientific phenomena that pertain to their lives. They stress the importance of using appropriate teaching methods to teach them and the course description is dedicated to them and increasing their scientific culture. As (Al-Falih, 1416 AH) pointed out in his study that teaching scientific subjects (chemistry, biology, and physics) in colleges in the Kingdom of Saudi Arabia are designed for them with vocabulary that differs from the introduction for specialists from non-specialists, but they are taught in the same way, and they find it difficult to study it, and this is also evident. Through the results of some studies such as the study (Zoller and Pushkin, 2007). - Despite the importance of what was previously mentioned by developing a description of the general chemistry course for non-specialists, the reality in the special education department is still concerned with describing courses that are not related to the specialization, such as the general chemistry course, and the description was concerned only with providing the student with an enormous amount of knowledge and scientific information fragmented for the subject and some of them are not interrelated With some and not related to the major and be forgettable, he did not care about practical applications in the student's life and understanding the scientific phenomena that pertain to the student's life and specialization. of the teaching profession, and also included the report issued by (Counci Of Chief State Officer School 2001l) which It aimed to provide a guide for professional organizations and teachers of special education in order to achieve effective teaching for extraordinary students This is in accordance with the quality standards, which included several main elements, including: the nature of curriculum content, teaching strategies, evaluation methods, and methods of curriculum adaptation (Al-Khatib, 2009, 141-145, Al-Khatib and others, 2013, 43-58 and Al-Qurashi, 2013, 141-144) It should be noted that the Arab countries have worked to keep pace with the movement of comprehensive standards and quality existing at the global and local level, as the Kingdom of Saudi Arabia has developed study plans for the Department of Special Education, including Umm Al-Qura University represented by the College of Education in terms of carrying out its educational scientific mission by preparing a study plan for the Department of Special Education Its aim in that is to improve the level of quantity and type of services provided to special groups (College of Education Guide, 2008, 1432 AH, 241). Therefore, it should be emphasized that its courses are subject to the quality standards of the extraordinary field. Among the decisions of this section is general chemistry for special education. There are many projects to rebuild science curricula, including chemistry, in the United States of America, which aim to increase the level of scientific culture by introducing important scientific concepts (Ali, 2007). Chemistry has its own language. Its letters are chemical symbols, and if they are combined, they are a chemical compound, and whoever is proficient in understanding their symbols will find himself familiar with the basics of this science and its implications except to study chemical concepts to develop his innovative thinking and use

included in the general chemistry course for special education students?

Objectives of the study:

The current study aims to:

1- Determining the concepts of general chemistry to be developed among female students of special education in light of the systemic approach.

2- Clarifying the procedures for the quality of teaching scientific concepts using the systemic approach in the general chemistry course for special education students?

3- To reveal the extent of the impact of using the systemic approach in developing the concepts of general chemistry on academic achievement among students of special education at Umm

special education in the first semester of 1440 AH at the College of Education, Umm Al-Qura University. - And it was limited to some concepts related to general chemistry for special education.

Terminology of study:

Systemic approach to teaching and learning: It is intended to study concepts or topics through an integrated system in which all the relationships between any concept or topic and other concepts or topics are clear, which makes the student able to link what was previously studied in a stage with what he will study in a stage through a specific and clear plan to prepare it in a curriculum or A specific rapporteur (Al-Kubaisi, 2015.19). The systemic approach is defined procedurally in the current research as: The systemic approach can be defined as "educational experiences that are interacting and integrated together and that depend on each other and are interconnected together through a network of correlations and mutual relationships to achieve specific goals, which make the student able to relate what has been previously studied and build knowledge on her own with what she studies of topics and what she will study in The next stages in the general chemistry course for special education Concepts of Chemistry: He defined it (Al-Asmar,

Hence, the research problem can be identified in verifying the effect of the quality of teaching on developing scientific concepts in chemistry in light of the systemic approach among female students of special education at Umm Al-Qura University in Makkah? It is divided into the following sub-questions:

1- What are the scientific concepts included in the general chemistry course to be developed by female students of special education at Umm Al-Qura University in Makkah Al-Mukarramah?

2- What are the procedures for the quality of teaching scientific concepts using the systemic approach in the general chemistry course for special education students?

3- What is the effect of using the systemic approach in developing the scientific concepts Al-Qura University in Makkah Al-Mukarramah.

The importance of studying:

1- The study provides information on how to use the systemic approach in the quality of teaching general chemistry for special education students at Umm Al-Qura University in Makkah

2- The study provides an examination of general chemistry concepts for special education students for postgraduate students and researchers

3- The availability of a new vision in the quality of teaching general chemistry for special education, and the importance of employing systemic approaches in the teaching process that may benefit those in charge of teacher preparation programs and science teachers in the Faculties of Education.

4- The current research may open a field for other research in applying the systemic approach to the branches of science (chemistry, physics and biology) and other sciences from the perspective of systemic integration.

The limits of the study:

The study is limited to a sample of female students studying the general chemistry course for

based on memorization and rote memorization. Meaningful learning, which was presented in a linear, sequential manner that there is no interconnection between them, which leads to the difficulty of students' understanding of these concepts and applying them in different life situations.To overcome the limitations of the linear approach in presenting concepts, it can be presented in a coherent, intertwined and integrated form in a systematic form, which helps them To think, the goal of teaching students how to think becomes one of the basic goals in the field of teaching general chemistry for special education. Scientific concepts in chemistry: The scientific concept is a mental process by which a group of common attributes or characteristics are abstracted, or through which a number of observations related to a group of things are generalized, and information about characteristics or a process that distinguishes between more than one concept or information is organized through it. Najdi et al., 2003,342) Al-Issawi (2008, 40) believes that scientific concepts are an abstraction of the common elements between several situations or facts, and include processes that distinguish between a group of stimuli, and are considered one of the most important outcomes of science through which scientific knowledge is organized into a meaningful form. In terms of being a product of the mental process, it is the chemical symbol or concept that is given to a group of common properties, or many observations, or a group of organized information and has a specific meaning called a concept. The concept may be descriptive, such as the concept of the atom, the element and the chemical compound. The scientific concepts in chemistry are among its most important aspects because of their importance in organizing experience, remembering knowledge, linking it to its sources, and facilitating access to it. The importance of 2008, 35, Zaitoon, 2004) as what the individual has of meaning, understanding and the ability to apply that understanding in new situations through mental perceptions of a specific phenomenon, and it consists of a name or a verbal connotation. It is a term for the terms used in describing a general chemistry course for special education General chemistry: Chemistry is the science of the components of matter and its composition through the links and interactions between elements and minerals to form chemical compounds, including genetic ones. It provides all sciences with the concepts necessary to employ them in life situations 1- Here, the role of the faculty member appears to communicate that chemical information with the strategy on which it is based in an organized manner and is related to the specialization of special education and not to the amount of the chemical scientific material that he is familiar with, so the abundance of his material becomes useless without using a specific strategy to teach him, and the best measure for him is “what you can do and not what Know or store information "(Jaafar, 2002, 26; Al-Nawashi, 2007, 59-60). General chemistry for special education procedurally: It is intended to organize the concepts in a general chemistry course for special education with each other through interactive reciprocal network relationships, working together as a whole towards achieving specific goals. In it, the relationships between any concept and other concepts are clear, taking precautions for the use of chemicals in laboratories that may lead to disability, and providing students with educational experiences through their studies using the systemic approach.

Theoretical framework and previous studies: First: The theoretical framework: The world is witnessing a revolution of scientific and technological progress, which has imposed on the field of education and education to carry out many educational changes, in line with the nature of this era, and there is no doubt that the approaches and methods of teaching were among the most prominent educational fields that have been renewed, in order to transform learning concepts

laboratory, which represents the cornerstone of teaching chemistry by conducting experiments accurately in it, and it helps the learner to quickly discover scientific knowledge and establish it in His mind, developing his scientific thinking process, raising scientific trends in him, instilling in him a love of science and scientists and appreciating the value of science in the development of society, as well as taking care of safety in the laboratory and preserving the absence of pollution or pollution of the surrounding environment because of its risks and may lead to disabilities, so mastery must be made. The instructions are not to be tolerated, no matter how simple they are. (Jaafar, 2002 24-33 and Shaheen 2006) This leads us to link general chemistry with special education.

Ssystemic approach: Definition of systemic approach: It was agreed to define it (Hassanein, 2002, 113, Al-Pope, 2008, 8 and Nasr, 2009, 264) that it is a study of organizing concepts and topics through an integrated system in which all the relationships between concepts and others are clear, making the learner able to link between previous and new concepts and perceive relationships Between them and the facts to achieve the desired goals. From the previous definition, we find that the systemic approach is a structured analytical method that enables us to advance towards the goals of teaching chemistry, by means of a coherent and successive action of the parts that make up the system, and works on the integrated vision of the concepts, so they integrate, intertwine and interact with those parts according to their functions that they perform in the overall system of the curriculum. The curriculum is considered a system made up of a group of elements that are based on interrelationships among them, and any change in one of its elements leads to a change in its other learning scientific concepts: Educators emphasize the importance of chemical concepts, as clarity of concepts and terminology is necessary for understanding, comprehension, and achieving scientific understanding and communication. It also gives scientific knowledge its flexibility and allows it to organize. (Salama, 2004, 55) explains that learning scientific concepts works on: Reduces the need to re-learn when confronted with new learning Helps guide and predict any activity Collecting facts, classifying them and reducing their complexity. Learning concepts helps to explain new and unfamiliar situations and events, and to convey the learning effect. Leads to highlight the interdependence and complementarity between the different branches of science. The study of concepts leads to an increase in students' interest in chemistry and increases their motivation towards learning it, especially when it is related to the specialization, and increases their ability to use the main and subsidiary functions of science, develop innovative thinking, choose experiences, organize educational situations, define goals and achieve them. Concepts grow through the maturity of students and the growth of their experiences since the beginning of their learning. They develop with the growth of knowledge. Therefore, scientific concepts are considered as the constructive units of chemistry and scientific knowledge in their construction of principles, generalizations and scientific theories and their reduction of the vast amount of facts. Therefore, it was necessary to use the systemic approach in order to help in the growth of chemical concepts upon learning, which is an important goal in teaching them. How do we study chemistry: Chemistry is characterized by a special language, which are the chemical symbols that each indicate an element of the discovered elements, which combine with each other to form a compound, and this formation takes place in the

background and that this theoretical cognitive background was a theoretical basis upon which this approach was based. Here, it is necessary to clarify the objectives of the systemic approach in teaching and learning, leading to the organization of the content of a general chemistry course, in light of this approach as being of interest to this research. Objectives of the systemic approach: The systemic approach to teaching and learning aims to achieve the following: 1- Raising the efficiency of teaching and learning 2- Making the study materials attractive to students instead of being repulsive to them. 3- Developing students' ability to systemic thinking so that the student is able to have a comprehensive future vision for any topic. 4- To develop the ability to see relationships between things 5- Growing the ability to learn, increasing its speed, and retaining and retrieving the learned material 6- Developing the ability to develop higher skills for thinking, such as analysis, synthesis and evaluation, in order to reach creativity, which is one of the most important outputs of any successful educational system. 7- Preparing a generation capable of positive interaction with the ecosystems in which they live and the state agencies to raise their efficiency. 8- Developing the ability to analyze and relate events taking place around the world. 9- Developing the ability to use the systemic approach when addressing any problem to develop creative solutions to it (Al-Kubaisi, 2015, 27-28 and Fahmy, 2002, 12). Systemic approach to teaching general chemistry for special education: Many researchers in the field of science for special education have confirmed that the systemic approach in its teaching is a modern approach in terms of graduating students from one stage to expanding their perceptions and knowledge about this course, through the adoption of educational approaches and theories that prove their effectiveness in teaching students. In this elements. Considering that teaching chemistry is one of the branches of science as part of the curriculum, this part is affected by what the whole is affected by. Therefore, chemistry teaching must emphasize the development of higher mental processes to achieve understanding and indicate the extent of correlation, complementarity and relationships between scientific knowledge in the form of a regular structure on which the learning process proceeds, Here, the idea of inclusiveness that characterizes the systemic approach becomes clear as it represents a system that includes the role of the teacher and the learner, methods, content, the learning context, and other elements of the curriculum, which considers the curriculum system with its various aspects of objectives, content, methods of teaching, media and evaluation, as it is a comprehensive framework for preparing and training students in the present and future to think The systemic approach to the content of the chemistry course in particular, and if we consider the curriculum as a set of experiences that students go through during their learning period, then by using the systemic approach, these experiences can be organized through a system in which all the relationships between those experiences are clear. The components of the curriculum are based on interrelated relationships among themselves, and it follows that any change in one of the components of the curriculum requires changes in the other components, so they must be organized (Al-Khalifa, 2015, 2 and Al-Tanawi, 2002). Among the most important features of the systemic approach mentioned by Al-Kubaisi: 1- Systemic 2- Constructivism 3- College 4- Double feeding 5- Integration 6- Continuity 7- Educational umbrella 8- Quality (Al-Kubaisi, 2015, 28-29). From the above, and from the clarification of the systemic approach, it becomes clear that the approach was based on an educational and psychological

course development process. - It increases the efficiency of the faculty member. It is used in various stages of the lecture from beginning to end. Helps in connecting the different parts of the course with each other Helps develop the spirit of cooperation between the member and the learner. - It connects previous knowledge, current knowledge, and next knowledge. - It interacts with the problem in a comprehensive and integrated manner, as it calls for what suits the problem from previous experiences. - Help a teacher to organize the content in an investigative manner through short outlines. Provides an environment rich in sensory stimuli that allows the learner to actively interact with them. - An exercise in inference that leads to the inclusion of new knowledge within the cognitive structure and linking it to previous knowledge. - It helps to increase the effectiveness of meaningful learning, and thus the collection and assimilation of concepts, in a more stable and less likely to be forgotten. The systemic approach is based on the theories of cognitive psychology in presenting new experiences in the form of interconnected and interconnected systemic schemes. (Al-Kubaisi, 2015, 85-86) The systemic approach acquires value and vitality in the field of teaching, as it highlights the basic concepts and ideas that have been learned, and clarifies the relationships between them and the above in an integrated method that does not distract attention on small particles, as it is a determinant on which the discussion between the teacher and the learner is based, and a tool to facilitate learning content in a functional manner. Meaning, which leads to positive results of the learning process. It is also used in the process of linking the different parts of the curriculum to each other and with what was previously studied in previous stages. And it helps to develop the spirit of cooperation between the student and the teacher, which helps to identify alternative perceptions present in the cognitive regard, we are trying to define the relationship between the systemic approach and the field of general chemistry for special education, given that this approach is of interest to this research, as it was mentioned (Al-Qadi, 2012 and Jaafar, 2002, 65-67) that he directs a lot of attention to teaching science in its branches (chemistry Biology and Physics) for non-specialists and this aspect needs a lot of precision in designing the vocabulary of the courses because they do not have sufficient scientific backgrounds related to those courses and the study of the various scientific phenomena that surround them and are related to the specialization. There are American and British projects to teach chemistry whose aim is to provide the student with the ability to help him reach chemical facts and concepts in practical application in daily life and not by preserving chemical information through the method of indoctrination. Jafar also added that everything around us includes chemistry in its composition, even our bodies and what is in it. Operations condemned for chemistry (Jafar, 2002, 162-163), and he added (Abd al-Saadawi, 2009, 217) by linking chemistry with special education specialization through genetic compounds that contain chemical elements and God Almighty has designated these compounds to carry the genetic traits and any defect that leads to To disability and that is through the systemic entrance.

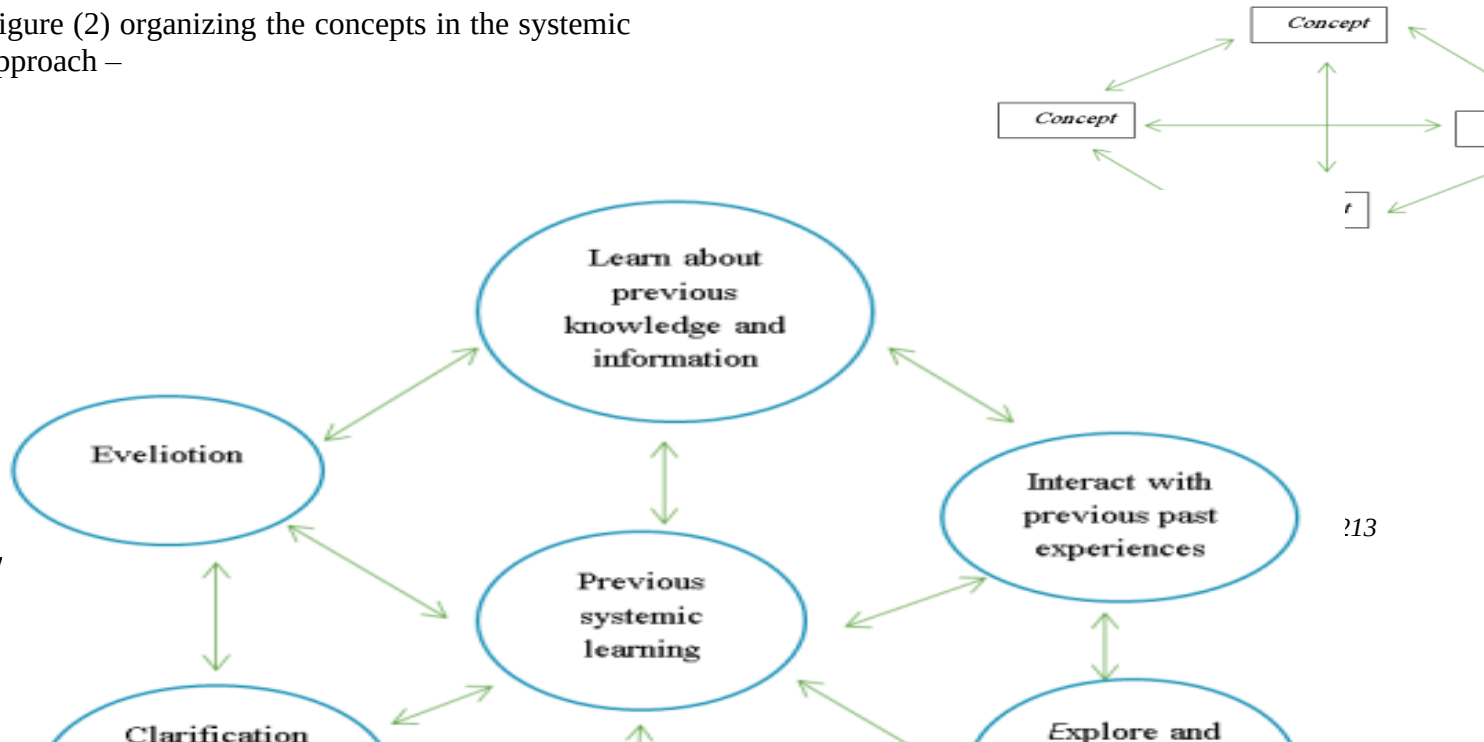
The importance of using the systemic approach in teaching chemistry: The systemic approach is used in the teaching of chemistry to reveal the relationships between compounds and to clarify the processes that make up these compounds. It prevents fillers and recurrences, saving time and effort. Emphasizes the interrelationships between experiences. - It is used in the process of planning and organizing the course, which confirms the knowledge function, and the relevance of experiences to life problems It is used in the

The content of chemistry concepts for special education is organized according to the systemic approach in a comprehensive systemic form that highlights the intertwining, overlapping and complementary relationships between the various concepts and ideas that make up the course content (Al-Zamil and Repet, 2001, 76). The researcher has organized general chemistry concepts for special education according to the systemic approach according to the following steps: Review the literature on the systemic portal. Determine the educational goals to be achieved. - Developing a perception about the interrelationship of what has been studied and what the student will study in this course. - Preparing the teacher's guide according to the above so that the proposed concepts are divided into lectures so that each lecture includes a title and previous experiences, the timing of the lecture, the activities involved and the educational aids, the behavioral procedural goals, the implementation steps and the evaluation of all kinds. Since this study is concerned with studying the effect of employing the systemic approach in developing concepts, the researcher will explain in some detail the research vocabulary that includes the systemic approach and scientific concepts in the general chemistry course for special education as in Figure (2).

Figure (2) organizing the concepts in the systemic approach –

structure of the learner, and correct them during the learning process. Steps to build and plan course content systematically (Al-Saeed, 2005, 500): 1. Determine the course (or subject or unit) to be formulated systematically. 2. Determine the various goals that the learners want to develop, and this step is one of the most important steps in building the system 3. Analysis of the academic content or unit to be built in the systemic approach. 4. Determine the meaning of each concept as it appeared within the content or topic. 5. Defining the previous concepts used in the academic stages necessary for studying this unit or topic. 6. Arranging concepts and principles in a systematic diagram to highlight the relationships between them. 7. Establishing links between concepts and principles to highlight the quality of the relationship between them. Lines and arrows are used to indicate the direction of the relationship with writing a specific expression on the line indicating the relationship between the concepts. (Fahmy, Abdel-Sabour and Al-Sayed, 2005) summarized the stages of the systemic approach to education in the following figure (1):

Figure (1) The stages of the systemic approach Systemic approach for organizing the content of chemistry concepts for special education:



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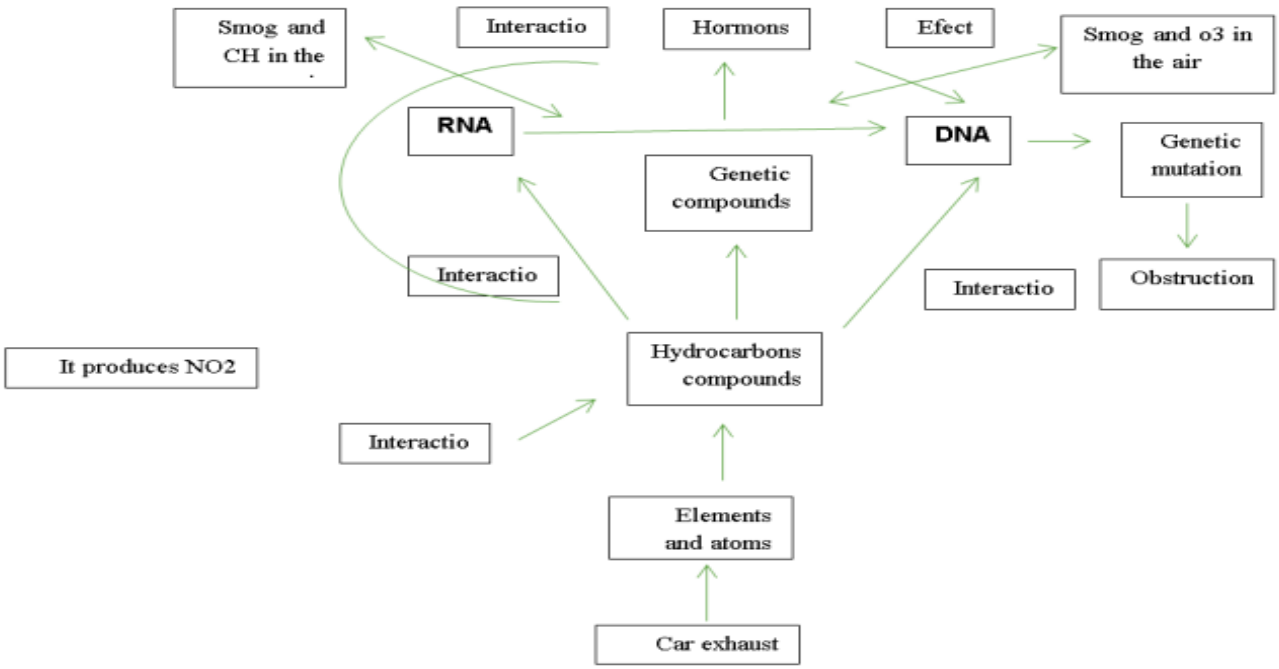
Some concepts were identified in a general chemistry course for special education, namely (composition of matter, elements, symbol, formulas, minerals, hydrocarbons, reactions, chemical bonds, chemistry and humans, the harmful effects of chemicals on the functions and health of human body systems and the environment, chemical composition of genetic compounds. (DNA & RNA and hormones) and its relation to disability, safety and security precautions in chemistry education in laboratories to avoid disability). They are related to general chemistry for special education. We will put some of them in a systemic form as in Figure (3)



systemic approach to overcome the difficulties of learning science for third-year middle school

Second: Previous studies: Nasr Study (2009): This study aimed to know the effectiveness of the

by teaching them effectively 2- Providing teachers with observation and diagnosis skills, and developing programs for the disabled 3- Preparing teachers to teach physically and mentally handicapped people until the end of secondary school 4- Preparing a consultant teacher and an expert in individual education in teaching the disabled who are unable to learn 5- Preparing educators, researchers and intellectual intellectuals and innovators The talented people may have clear and specific courses, including science courses in their branches that help in the detection and crystallization of their preparations and talents of knowledge and work to develop them and create opportunities for training and practical and actual practice (Al-Qadi, 2012, 20). A study (Lawson etal. 1990): And confirms in their studies in America and their observations on students who study biology course for non-specialists in science, it was found that - Some students have a lack of understanding and knowledge of the important scientific concepts of the biology course, and they do not have interest in understanding the scientific phenomena that pertain to their lives. They emphasize the importance of using appropriate teaching methods for their teaching and the course description is dedicated to them and increasing their scientific culture. - As (Al-Falih, 1416) pointed out in his study that teaching scientific subjects (chemistry, biology, and physics) in Teachers Colleges in Riyadh in the Kingdom of Saudi Arabia, where vocabulary is designed for it that differs from the introduction of specialists from non-specialists, but it is taught to them in the same way, and they find it difficult to study it. . Zoller and Pushkin (2007): And among the results of their study, as it resulted in a low level of learners as a result of caring for the amount of knowledge without adapting during the teaching process - Study (Al-Nawashi, 2007, 33-39): He referred to studies that students, and to know its impact on the development of thinking. The researcher followed the descriptive and analytical approach and the experimental method by selecting a sample consisting of (238) male and female students, on whom a survey and diagnostic test were applied. Of two groups, one of them is a control group of (44) male and female students, and the other is a reckoner, which is (45) male and female students. The tools used are the diagnostic test, the opinion poll and the systems thinking test. The results of the study showed the effectiveness of the systemic approach in both the achievement tests and the systemic thinking tests. The Pope's Study (2008): This study aimed to know the effect of a computerized program using the systemic approach to develop scientific concepts in science and to retain them among tenth grade students. The researcher used the descriptive, analytical and experimental approach to measure the program and the structural approach to build a byte unit using the systemic approach. He selected a sample of (40) male and female students, and distributed equally between the control and experimental groups. The tools were to test scientific concepts and a content analysis tool to determine the scientific concepts included in the unit. The study showed the effectiveness of the computerized program and its role in developing and retaining scientific concepts among tenth grade students. A study (Najdi et al. 2006, 100-108): A study of twenty departments of special education in the universities of the United States of America was presented with an analysis of the content of the curricula of each department and a proposed conception was developed for the Department of Special Education at the Faculty of Education at Helwan University. The objectives of all the departments are relatively close, and they are as follows: 1- Preparing educators, teachers and clinicians who are competent in special education

academic achievement and trends towards science for the first grade Preparatory and study (Yasmine Hassan, 1996) to measure the academic achievement of first-grade agricultural secondary students The survival effect of their learning These studies agreed on the existence of statistically significant differences in favor of the experimental group who They studied using advanced organizations on control group students who studied in the usual way of achievement Scholastic, and the trend towards science subject and the survival impact of learning.

Ccommentary on previous studies: In light of the studies presented and the results obtained, it can be said that the current study differed from previous studies in identifying the effect of using the systemic approach in developing scientific concepts in the general chemistry course for special education students, and it did not address this topic on the limits of the researcher's knowledge, and the researcher noticed Most of the studies dealt with the subjects of science and mathematics almost and (Al-Falih 1415) mentioned that scientific courses must be taught in colleges of education that differ from specialists. He did not mention the female students of special education, and this is consistent with our current study by developing scientific concepts related to the specialization of special education. As for (Najdi, 2006) I talked about the special education program in general and did not address the scientific decisions, and the studies that I referred to (Al-Tanawi, 2002, Nasr 2009, and Al-Pope 2008,) To measure the effectiveness of the systemic approach, and this is consistent with the current study of using the structured approach for a general chemistry course for special education. The current study is similar to some studies in terms of the goal of using the systemic approach, and in terms of methodology, most of the studies used the experimental method, as they agreed in examine the relationship between the acquisition of scientific concepts and its relationship to cognitive development in children. Ball & Sayre (1972) to measure the level of achievement in biology and chemistry, study A (Subhadhira, 1977) in Thailand to measure the level of achievement in science. Lawson, 1983) study in California, USA, to measure the level of achievement in science. - The study of al-Rhetoric and Na'ashi, (2000): In Jordan, to measure the level of achievement in science, and he also indicated that many The Arab countries suffer from low outputs of teaching sciences in general and chemistry in particular, which is represented by weak scientific skills And the process and the diminishing interest of learners and their scientific tendencies, and sought to reveal the level of cognitive development of students The basic stage in Jordan and its relationship to educational level and achievement in the sciences, and found statistically significant differences It is attributed to the educational level and the existence of a positive and statistically significant correlation between the level of students' performance Knowledge and achievement in science. The two researchers recommended the importance of educators and those in charge of developing science programs With the level of knowledge development of students when developing curricula and teaching methods, the researchers also recommended that more be done Of studies on strategies that contribute to developing students' understanding of abstract scientific concepts and science processes And scientific thinking skills. A study (Al-Tanawi, 2002, 287-296): As indicated by the studies concerned with the use of developed organizations in Teaching, was a study (Mr. Al-Maraghi, 1994) to measure the level of achievement of scientific concepts of science for college students Education and Study (Mohsen Abdel Qader, 1994) to measure

Umm Al-Qura University, and the equivalence of the two groups was ascertained and one group represented the experimental group that studied using the systemic approach and the other was a control and the number of students (40) female students, and another officer who studied in the usual way. Their number is (38) students, and the total number becomes (78) female students. Study tools: To answer the study questions, the researcher prepared the following study tools: A- Analyzing the content of a general chemistry course for special education. B- The systemic thinking test for chemical concepts of the special education. Search procedures: To answer the study questions, the following steps were followed: 1- Analyzing the content of the general chemistry course description for special education to determine the concepts to be used as a framework for the systemic approach. 2- Defining the concepts related to special education from the description of a general chemistry course for special education. 3- Building the analysis tool from the defined concepts according to the systems approach and ensuring its validity and stability. 4- Defining goals for the concepts 5- Building holistic systems that clarify the relationships between concepts and distributing their teaching to several lectures so that the relationships between them emerge according to the systemic approach. 6- Establishing links between concepts, principles and topics such as lines and arrows to highlight the quality of the relationship between them, and building a comprehensive systemic diagram to clarify the concepts, principles, facts and important topics that are taken into account, and after that, it is possible to move to building sub-system diagrams that clarify part of the course and so on. 7 - Building systems can take place at different levels when teaching the course during the first semester, and its implementation took eight weeks 8- terms of tools using the scientific concepts test. Studies and researches differed in dealing with the educational stage, some at the secondary stage, and some at the intermediate stage. Study procedures: In this chapter, the researcher deals with the procedures that were followed in this study and which were included Research methodology used in the study, a description of the population and sample of the study, the method of selection, and a constructive statement Study tool, finding its validity and stability, experimental design, controlling variables, It also contains how the study was carried out, and the statistical treatment that was used in data analysis Here is a breakdown of that:

Study Approach:

In this study, the researcher used the experimental method, which is called the experimental design and is known as the design with equal control and experimental groups, so that the pre and post test for the two groups are applied. In this curriculum, students of the two groups undergo a pretest to verify their equivalence. Then the experimental group is subjected to learning using the systematic approach of chemical concepts to describe the general chemistry course for special education, while the control group studies the chemical concepts to describe the general chemistry course for special education in the usual way. Then the two groups are subjected to the post test. And the independent variable in the study is the effect of using the systemic approach with which the experimental group was studied, compared to the usual input with which the control groups were studied, and the dependent variable is the achievement and learning of chemical concepts. The study sample : Two divisions were randomly selected from the groups of the Special Education Department who taught the general chemistry course for special education in the first semester of the year 1440 AH at the College of Education -

chemistry for special education, and the test vocabulary was formulated from the type of objective tests - multiple choice, distributed on the previous concepts, The test consists of (40) items in its initial form. - To verify the validity of the test, the researcher followed the method of validating the content, as it was presented to a group of professors who specialize in curricula and teaching methods, to find out how appropriate it is to the goal for which it was set, the correct formulation of its linguistic and scientific vocabulary, and to what extent the vocabulary measures the specific levels of knowledge. The amendments suggested by some of the arbitrators were made, so that the test consisted of (35) singles, and it was found that the agreement coefficient between them was ((0.88), which is an appropriate parameter that makes us trust the validity of the test and its suitability for the desired goal. And to verify the stability of the test according to the reliability coefficient using the Cronbach Alpha coefficient, it was found that its value is equivalent as a whole (0.97).

Table (1) Calculation of test reliability

The stability value	analises	variance	Mean	The number of test items
0.95	Alpha Cronbach	161.56	17.60	35

beforehand to the experimental and control research samples, and the arithmetic averages and the standard deviation were calculated as in Table (2).

Table (2): Arithmetic averages and standard deviations on the General Chemistry Pre-test

S.D.	Mean	No. of Students	groups
11.95	15.51	40	Expermental
5.53	3.80	38	Control

Preparing a guide for teaching the selected concepts using the systemic approach and identifying methods, strategies and methods of teaching it to develop students 'thinking. 9- Presenting the guide and the tool to a group of referees from among the faculty members of the Department of Curricula and Methods of Teaching Science and Special Education to explore their views on the selected concepts and they have been approved and appropriate for the special education major to be taught. 10- Preparing an achievement test for chemical concepts. It aimed to measure students 'achievement in the cognitive content of the chosen concepts (composition of matter, elements, symbol, formulas, minerals, hydrocarbons, reactions, chemical bonds, chemistry and humans, the harmful effects of chemicals on the functions and health of the human body's organs and the environment. The chemical composition of genetic compounds (DNA & RNA and hormones) and their relationship to disability, safety and security precautions in teaching chemistry in laboratories to avoid disability). They are related to general

11- After determining the validity and reliability of the test, making sure of the time required to perform it, and the clarity of its instructions;The test in its final form has become composed of (35) items of the objective test - multiple choice. 12- The achievement test for general chemistry concepts for special education was applied

Results of the study and their interpretation: This chapter deals with a detailed presentation of the results of applying the experimental study to the study sample, analyzing and interpreting them through answering and interpreting the study questions. The answer to the first question of the study What are the scientific concepts included in the general chemistry course to be developed by female special education students at Umm Al-Qura University in Makkah Al-Mukarramah? To answer this question, the researcher analyzed the content of the description of a general chemistry course for special education. The results of the study resulted in a list of chemical concepts, and their validity was confirmed after they were presented to a group of arbitrators, and the list was reached as in Table (3

13- General chemistry concepts for special education for the control group were taught in the usual way, and the experimental group was applied to the systemic approach to general chemistry concepts for special education. 14- The achievement test for general chemistry concepts for special education was applied to the experimental and control research samples. Monitor results, process them statistically, analyze, discuss and interpret them. Data were analyzed using the SPSS program 15- Submitting recommendations and proposals 16- The statistical methods used in the study: The researcher used the following methods: -Test (T) to test the differences between the control and experimental groups after applying the experiment. - Impact calculation to verify the effectiveness of using the systemic approach on the experimental group.

Table (3) the chemical concepts to be developed for the female students

Concepts	No.
Atom	1
code	2
Elements	3
Composition of the material	4
Chemical formulas 1	5
Chemical compounds	6
Minerals	7
Chemical reactions	8
Chemical bonds	9

various strategies, methods, and activities to motivate the students to learn concepts. The concepts were studied by the control group in the usual way. Then, he applied the post test after teaching all the concepts in the course. The arithmetic averages and the standard deviation were calculated on the post-achievement test as in Table (4). Also, to verify the presence of differences between the control and experimental groups, the researcher used the T-test.

It is clear from the previous table that the number of concepts is (13) understandable. Which was taught to the control and experimental groups The answer to the second question of the study What are the procedures for the quality of teaching scientific concepts using the systemic approach in the general chemistry course for special education students? They were taught during (8) weeks and were linked with each other using the systemic approach as in Figure (3) p. 14 in the current research of the experimental group. It also used

achievement test and calculating the effect

Table (4): Arithmetic averages and standard deviations on the general chemistry post-

Effect size	T-test	S.D.	Mean	No. of Students	groups
2.85	**2.26	11.95	15.51	40	Expermental
		5.53	3.80	38	Control

development result in large differences in their cognitive abilities, and if we take into account the growth of scientific concepts occurs as a result of the student's interaction with things. The styles and methods of direct teaching will not have an effect on their cognitive development and thus reduce their ability to understand scientific problems. This is consistent with the aim of the present study using different teaching strategies consistent with the selected chemical concepts. - The impact was significant on the experimental group for their knowledge of linking chemical concepts such as the genetic compounds entered into Their composition of chemical elements, and God Almighty has specified these compounds to carry the genetic characteristics and any defects that occur A genetic mutation in it that leads to disability. Therefore, through the systemic approach and clarifying the relationships between concepts It improved learning to become meaningful and effective learning in acquiring concepts and linking them to specialization. The students also get acquainted with the concept of the structure of matter and relate to the singularity of elements, minerals and chemical compounds (Especially genetic compounds) and chemical interactions and linkages in humans in terms of the harmful effect of substances Chemicals on the environment, then on the functions and systems of the human body, and this is what a special education student needs to know This course is about the cause of the disabilities. So it must be avoided and take safety and security precautions

It is evident from the previous table that the value of (t) is statistically significant at the level ($0.05 \geq \alpha$), and this indicates the existence of significant differences in favor of the experimental group in the post-test as a result of using the systemic approach. The answer to the third question of the study: - What is the effect of using the systemic approach in developing the scientific concepts included in the general chemistry course for special education students? To answer this question, the size of the effect was calculated and it was large in the total score of the test, and this indicates that the effect of teaching when using the systemic approach on the experimental group is large in developing chemical concepts as in Table (4) above. Interpretation of the results: It is evident from the results of the impact size of using the systemic approach in teaching chemical concepts to the experimental group students has a great impact on developing their systemic thinking. And because recent trends focus on a new concept of the role of a chemistry teacher based on organizing and directing students to learn by means of investigation, discovery, and work in groups, and not on indoctrination or direct education. Hence, the basic task of a chemistry teacher is to teach students how to think, not how to memorize lessons without understanding, absorbing, and employing them in life. This is consistent with the objective of the present study. The teaching of chemistry is closely related to the cognitive development of students, as the differences in their levels of cognitive

group to acquire the skills of working in a team spirit, accepting the opinions of others, discussing them and evaluating the group activity, which encourages innovation in providing information and knowledge related to the description paragraphs and also individually and when each student speaks at a specific point of the description The proposal, here we reduce the use of the traditional method that focuses on the presentation of the faculty member to the lecture and his activities only. In the field of university education quality, there is a need to plan the description of the courses and their relevance to the specialization and aim to develop the student's ability to think and how to propose and present the vocabulary in the description with new, attractive and exciting ideas for female students.

Conclusion of the study results:

The results of the study showed that the use of systemic crowbar in teaching has a significant effect on developing chemical concepts compared to the usual method. Study recommendations:

In light of the results of the study, the study recommends the following: 1- Expanding the use of the systemic approach in improving students 'understanding of the scientific concepts included in the General Chemistry course for Special Education 2- Paying attention to the development of chemical concepts through the use of different strategies and methods of teaching and approaches 3- Development of higher-order thinking skills for university students, through the use of modern teaching methods, strategies, methods and approaches. Suggested studies: 1- Study the effect of employing the systemic approach in developing various thinking skills. 2- Study the effect of employing the systemic approach in developing chemical enlightenment. 3- Study the effect of employing the systemic approach in the decisions of the Special Education Department and its relationship to educational level and achievement when using chemicals The results were consistent with the results of the studies of both Al-Falih and Al-Nawashi (Zoller and Pushkin Sundberg and (Dini, 1993 & Lawson, etal)) about the low outputs of teaching science in general and chemistry in particular, which is represented by a lack of understanding and knowledge of important scientific concepts and phenomena that pertain to their lives in the science course and a diminishing interest in Educated people and their scientific tendencies, especially non-specialists. As for the results of the rhetoric and the nawashi, the development of curricula, decisions and teaching methods, and this is consistent with the aim of the current study in terms of teaching general chemistry concepts for special education interconnected with each other through the systemic approach, as it resulted in a decline in the level of learners as a result of concern for the amount of knowledge without adaptation during the teaching process Especially for non-professionals. The agreement was with the results of the studies of Al-Falih and Al-Nawashi, Al-Khattabiah and Al-Naashi (Zoller and Pushkin Sundberg and (Dini, 1993 & Lawson, etal)) and they emphasize the importance of using appropriate teaching methods to teach them and the course description is intended for them to increase their scientific culture and develop students' understanding of scientific concepts Al-Nawashi, Arthur Costa and Wilberg, also explained about the teacher and the importance of his role in the educational process and the extent of its influence on the behavior of his students, their concept of themselves, their social relations, their level of thinking, the development of their mental skills, their achievement and their learning through the use of modern and different strategies, methods and teaching methods. And because the cooperative learning method is considered a group activity that takes place through working in a

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