International Journal of Psychosocial Rehabilitation, Vol. 26, Issue 02, 2022
ISSN:1475-7192

THE ROLE OF THE CONSTRUCTIVIST LEARNING CYCLE STRATEGY IN THE TEACHING PROCESS

Khemmad Mohammed [1], Ben khalifa smail [2], Mezaini Djilali [3]
[1] University of El Oued – Hamma Lakhdar(Algeria), khemmad-mohammed@univ-eloued.dz
[2] University of El Oued – Hamma Lakhdar(Algeria), Benkhalifa-smail@univ-eloued.dz
[3] University Djilali Bounaama khemis miliana(Algeria), d.mezaini@univ-dbkm.dz

Received: 04/10/2022 **Published: 31/10/2022**

Abstract:

Over the past two decades, educational research has seen major transformations in the educational process by researchers. This shift from questioning the external factors affecting learning, such as teacher variables, raises questions about what is going on in the learner's mind such as his previous knowledge and ability to handle information , And patterns of thinking, and among the theories that interested in this structural theory. Several educational strategies have emerged from this theory, including the learning cycle strategy.

The learning cycle is a teaching model that can be used by the teacher in classroom teaching as a teaching strategy. It emphasizes the interaction between the teacher and the learner during the educational situation and depends on the scientific activities.

Through this paper we will try to address this strategy from the beginning of its origin and then the definition and characteristics and to address the five stages in detail, and then the role of both the teacher and learner in this strategy, and how to plan teaching Through it.

Keywords: Stratégie de cycle d'apprentissage constructiviste ; Activer le processus éducatif

Introduction:

Piaget's theory of mental development is one of the most prominent cognitive theories whose educational applications have influenced teaching methods. Among the applications of Piaget's theory is what Atkin, Karplus and his colleagues did in designing the learning cycle model in 1962. Then Karplus and others introduced some Amendments in 1974, where the learning cycle was used in the project to improve science teaching in primary schools in America. The project to develop science curricula aims to develop students' scientific inquiry skills, develop their understanding of the basic concepts of physics and natural history, and develop students' scientific trends and abilities to use resources Learning and interacting with it in a live learning environment through the learning cycle model. Other programs were based on the learning cycle, such as the "ADAPT" project at University Nebraska 1977, where units were formulated in different curricula and each unit contains learning cycles representing each lesson cycle. It consists of three phases: Exploration Phase, Invention Phase and Application Phase, as well as the Elementary Science Study (ESS) project, and the American Association for World Criticism's project. Blame and these projects aimed to develop students' ability to acquire both scientific concepts, scientific thinking, various science skills and processes, tendencies, interests, and tendencies, and to deal and interact with them in an appropriate educational environment. (Ayman Shalayel, 2003, p. 39).

1- Learning cycle strategy concept:

Abraham & Renner defines the learning cycle as “a comprehensive teaching model that can be used to present curriculum materials, and this model divides education into three phases: the concept exploration phase, the concept presentation phase, and the concept application phase.” (Renner, Jon & Abraham, Michael: 1986, p121)

Hemler and Eking define the "learning cycle" as "a structural model that emphasizes the idea of learning occurring through three necessary phases: the exploration phase, the concept presentation phase, and the concept application phase".

Martin & Seton (1998) defines it as "a method of learning and teaching in which the students themselves carry out the process of investigation that leads to learning as seen by the constructivists." (Naif bin Ateeq Al-Sufyani, 2010, p. 14).

Good (1988) defines it as "a method of planning lessons in learning and teaching, based on the investigative process in order to organize the acquisition of knowledge and that correct understanding can be built through it." (Bushra Habad Al-Dhafiri, 2010, p. 22).

Definition of Blank (2000) “The learning cycle strategy is one of the most prominent methods that aim to teach concepts that seem difficult to many students, and helps to provide them with specific concepts whose understanding requires abstract thinking ability, and which may be difficult for students to learn through teaching methods.” In addition, it makes it easier for teachers to plan and organize the teaching process.” (Zayd Al-Adwan, 2011, p. 86).

Abdul Salam Mustafa defines it as “a teaching method or model that can be used in designing curriculum materials and content and strategies for science education, and it emphasizes the interaction between teacher and student, and depends on scouting activities to develop patterns of sensory and formal reasoning among students.” (Abdul Salam Mustafa, 2001, p. 99)

In the Dictionary of Educational Terms, Ahmed Hussein Al-Laqani and Ali Ahmed Al-Jamal (1996) defined it as: “A method of learning that depends on scouting experiences when the learner passes through the stages of detection, presentation and application of the concept using a set of educational activities and situations that help him achieve this”.

(Ahmed Hussein al-Laqani and Ali Ahmad al-Jamal, 1996, p. 111).

Effat Al-Tanawi (2002) defines it as "a method of teaching and a model for organizing curriculum materials, based on the equal roles of the teacher and the learner and the interaction between them, and it takes place according to three stages: the exploration stage, the concept presentation stage, and the concept application stage." (Mustafa Al-Tanawi, 2002, p. 182)

2-Learning course features:

The learning cycle is distinguished from other strategies in the following aspects:

It takes into account the mental abilities of the learners, and does not present the learner with concepts except what he can learn.

The progress of science as a research method, as learning proceeds from the part to the whole. This corresponds to the nature of the learner who relies on the inductive method when learning new concepts.

-It pushes the learner to think through the use of the concept of loss of balance، which is the main motivation towards searching for more scientific knowledge.

-It is concerned with developing the learners' thinking skills and work skills commensurate with how students learn.

This method provides an excellent field for planning and effective teaching in science.

)Khataiba, 2005) adds that the modified learning cycle provides in the educational learning environment a set of advantages that enable it to achieve learning effectively for students, including:

It provides the learner with the opportunity for self-learning, and activates his role in the learning process. The learner searches, explores and implements scientific activities and experiments, and builds scientific concepts by himself.

It provides the learner with the opportunity to acquire and practice various basic and integrated scientific thinking skills (such as observation, measurement, classification, formulating hypotheses, controlling variables, interpreting data, evaluating arguments and proofs), and then giving him the opportunity to represent the role of scientists, and this develops his positive attitude towards science and scientists, and towards various issues and problems. His community.

-It provides the learner with the opportunity for group discussion and positive dialogue with his fellow learners or with the teacher، which helps to develop the sound language of dialogue and make him active.

It provides learners with the opportunity to learn in groups with different academic achievement, and this develops them in the spirit of cooperation and teamwork skills.

It gives importance to the scientific content to be learned, and to how to select, plan and organize the experiences of this content in a manner commensurate with the stages of the learner's cognitive development, so that it is easy to understand and use in his daily life. (Bushra Habad Al-Dhafiri, previous reference, pg. 27-28 .

3- Stages of development of the learning cycle strategy:

The learning cycle initially consisted of three phases: exploration, concept extraction, and application. With the development of science teaching objectives, the learning cycle became comprised of four phases: the exploration phase, the interpretation phase, the expansion phase, and the evaluation phase. The learning cycle was also refined and refined by Roger Bybee in 1993, where the models of structural designs were focused in five stages: the Engagement stage, the Exploration stage, the Explanation stage, the Elaboration stage, and the Evaluation stage. (Salim Abdel Aziz Al-Khawaldeh, 2007, p. 76(

4- The Five-Year Learning Cycle (5E's) strategy:

It is clear from the above that the learning cycle was modified to the modified learning cycle (E's4), and here the modified learning cycle (E's4) was modified to the five-year learning cycle (E's5) Bybee, and referred to as (E's5), Because each of these five stages begins with a foreign letter (E), and each stage has a specific function that contributes to the learning process.

Bybee Roger has described the five stages of strategy in light of the nature of the learner, the nature of knowledge, and the method of teaching used by the teacher. The stages are:

4-1-Engagement stage:

At this stage, students' attention is directed to an object, problem, event, or situation. The activities of this stage are linked with previous activities and future activities. The linkage depends on the learning tasks, the link may be conceptual, procedural or behavioral, and the process of asking questions, identifying problems, showing contrast between events, and interacting with problem situations are among the ways that lead to students' involvement (immersion) in learning tasks and directing their attention towards them. The teacher is responsible for presenting instructional situations and assigning learning tasks. Creating excitement, generating curiosity, encouraging prediction, and asking thought-provoking questions, to raise for them questions and responses that reveal what they have of previous information and experiences, and how they think about the topic or concept.

-Why did this happen?

-How can I find this?

-What do I already know about this?

What can I find out about this concept or topic? (Sadiq Munir, 2003, p. 145).

4-2- Exploration phase:

The exploration phase activities ar designed with the aim of providing students with a foundation that enables them to continue building concepts, processes and skills. At this stage, physical materials and first-hand experiences should be made available as much as possible. The activities of the exploration phase aim to create experiences that students and teachers can then use to discuss concepts, processes, and skills. The teacher is responsible for giving adequate directions and appropriate materials related to the activity, and for

providing adequate time and opportunities to investigate objects, materials, and situations based on students' ideas of phenomena. As a result of students being physically and mentally immersed in the activity, they form relationships, see patterns, identify variables, and inquire about events.

It may be appropriate to guide students' thinking by the teacher as they begin to construct or, if necessary, reconstruct their interpretations.

The following questions help the teacher begin the planning process:

What specific concept will the students discover?

What activities should the students carry out to familiarize themselves with the concept?

What types of notes and recordings will students keep?

What types of instructions do students need? And how am I going to give it to them without telling them the concept? (Abdullah Muhammad Khataiba, 2005, p. 346)

4-3-The stage of explanation and interpretation:

At this stage, the teacher directs the students' attention to special aspects of the activities of the preoccupation and exploration stages, and then provides the appropriate explanations to put the exploratory experiences into the correct position. The stage of interpretation is a stage directed by the teacher, who uses various methods and methods in presenting concepts, processes or skills, including linguistic interpretation, video, educational films and educational software.

At this stage, the mental organization process continues, and students are able to interpret their previous experiences in general terms. Presenting concepts, processes or skills in short, in a simplified and direct manner, is the main objective of this stage, and then the move is made towards the next stage. The following questions help the teacher guide students to build a self-exploration of the concept:

What types of information or results should students talk about?

How do I help students summarize their results?

-How do I direct the students and at the same time refrain from telling them what they found، even though their understanding of the concept is not yet complete?

How can I help them use the information they get to build the concept in a proper way?

What descriptions should students give to the concept?

What justifications will I give to the students if they ask why this concept is so important? (Zayd Al-Huwaidi, 2005, p. 261)

4-4- Elaboration stage:

It is important at this stage that students use the explanations that have been developed in new situations, in order to develop and expand their understanding of concepts, processes,

and skills. This stage requires placing students in new situations and facing new problems that require the application of similar or similar explanations. This stage aims to help the learner to mentally organize the experiences he obtained by linking them to similar previous experiences, as new applications of what has been learned are discovered. . The teacher should give enough time for the students to apply what they have learned in new situations, and to link the concept with other concepts or topics. The following questions help the teacher to guide the students in organizing their ideas:

-What previous experiences did the students have related to the current concept?

How can I relate this concept to previous experiences?

What are some examples that link this concept to students' lives? And help them understand the relationship between science, technology and society? Also, help them develop investigative skills? And in possessing information about the history and nature of science.

What questions will I ask to encourage students to discover the importance of the concept? To apply the concept? Estimating the issue that could be resolved?

What experiences does the student need to enrich the concept?

What is the next concept related to the current concept? How can I encourage discovery of the following concept?

During these stages, the discussion takes place between the students themselves, and between the students and the teacher. The formative evaluation process is also carried out to determine the extent of students' progress in each stage on the one hand, and the possibility of their transition to the next stage on the other hand.

4-5 -Evaluation stage:

At certain points, students should receive feedback on the appropriateness of their explanations, and assessment should be continuous, not limited to assessment at the end of a chapter or unit. Multiple actions should be taken to conduct an ongoing and integrated assessment of learning and to encourage the building of concept knowledge and practical skills. Assessment can take place during each stage of the learning cycle rather than at the end of it. The role of the teacher is to observe students in the application of new concepts and skills, evaluate students' knowledge and skills, and allow them to assess their practical and collective knowledge. Helpful questions in this regard include the following:

What appropriate learning outcomes can I expect?

What types of techniques for assessing sensory experiences are needed to ensure students' mastery of basic skills such as observation, classification, measurement, prediction, and inference?

What are the types of sensory experience assessment techniques necessary to ensure the extent to which students master the skills of integrated learning processes, such as

identifying and controlling variables, procedural definitions, defining hypotheses, experimenting, discussing results and forming models?

What types of questions can I ask to help students reveal their ability to recall what they have learned? (Abdullah Muhammad Khataiba, previous reference, pg. 347-348).

5- The role of both the teacher and the learner in the stages of the learning cycle:

As the teaching process proceeds according to organized and cumulative steps in which each step depends on the step that precedes it, both the teacher and the learner have an important role in implementing the teaching process well, and in the strategy of the learning cycle, the role of the teacher and the learner varies in each stage of the learning cycle.

5-1-The role of the teacher during the stages of the learning cycle strategy:

(Abdullah Khataiba, 2005) indicated that the role of the teacher in the stages of the learning cycle is as follows:

Preparing the course in the form of a search for knowledge, not knowledge itself.

-Ensuring that the instructions only help the students in collecting information and that they do not suggest the concept to them.

-To formulate the concept of the learning cycle in a sound and close to the formulation of the learner.

The level of abstraction of the concept corresponds to the mental level of the learner. It is necessary for the learner to possess the mental level required to implement the learning cycle.

When recording the concept, the role is focused on the teacher and not on the students. The teacher records the results he obtained on the board and leads the discussion to reach the concept.

This requires the teacher to:

A - Ask his students to review and summarize their results from the activities.

B - To lead a discussion about the results of the students in the form of questions about the meaning of the results and aggregating them to reach the concept.

When applying the concept, the teacher should provide his students with appropriate opportunities to include the concept they have learned with other concepts that are related to it, meaning that the students use the concept they have extracted in other situations.

The teacher can choose the educational activities that serve the stage of applying the concept.

It is necessary for the teacher to be prepared for each course, so that the teacher can implement the course properly and so that the teacher does not interfere and marginalize the

role of the student. And other operations. (Abdullah Muhammad Khataiba, previous reference, pg. 344 – 345)

Among the things that the teacher must consider when implementing the learning cycle strategy are the following:

Divide the students into groups and it is preferable that the number of students in each group should not be less than five, and each group must contain students with different levels of achievement.

Preparing educational aids and tools for each lesson in advance.

-Preparing activity records in advance, and that the questions and notes written in them are appropriate for the age of the students.

-To give students, through the educational situation, sufficient opportunities for discussion and exchange of opinion within groups, and to carry out the activities of the detection stage, and the teacher should guide and observe them whenever necessary.

-The teacher must make sure that the students record their observations، observations and conclusions in the activity log.

-To be interested in carrying out training and exercises during the lesson to apply what has been learned and link it to previous learning as well.

The teacher asks his students to justify their results, predictions, or conclusions, regardless of whether those results are correct or incorrect. (Ismail Muhammad Al-Amin, 2001, pp. 53-54(

And (Abdullah Khataiba, 2005) pointed out that there is a set of standards that the teacher must adhere to when using the learning cycle or who takes Piaget’s thought as a guide for him in teaching. These standards are:

The teacher encourages his students to cooperate and work together.

It is necessary that observations or practical experiences on a particular topic precede the teacher's explanation of this topic.

It is important for the teacher to review the students' answers during their discussion and to deliberately create situations that require the use of logic, so that students practice the processes of science as well as the principles of reasoning.

When the teacher is explaining, he must stop several times to give the students an opportunity and allow time for discussion.

The teacher encourages his students to use the local environment in obtaining samples.

-When studying an abstract concept (imperceptible), it is preferable to bring this concept closer to the mind of the learner by making a model for it from the available materials.

-The teacher can organize a number of scientific trips closely related to the topic and encourage his students to think critically and the students practice practical activities on their own.

-That the democratic atmosphere prevail over the classroom atmosphere. Piaget believes that the teacher gives the opportunity for his students to participate in decision-making. (Abdullah Muhammad Khataiba, previous reference, p. 350.)

5-2-The role of the learner in the stages of the learning cycle strategy:

Since the learner is the focus of the educational process, he has a role that cannot be overlooked during the implementation of the lesson. Among the roles that the learner has to play when implementing the learning cycle strategy are the following:

1-Concept detection stage: This stage requires the learner to explore the concept to be learned by performing a series of activities. They are also responsible for exploring materials, dealing with them, collecting and recording notes.

2-Concept presentation stage: In this stage, learners build the concept in a cooperative manner by summarizing the results and assigning descriptions to the concept, the ability to give justifications for why the concept is important, and the role of the teacher is limited to providing the language or framework that helps complete the process of cognitive assimilation.

3- Concept application stage: This stage is centered around the learner, where the learner uses the information provided to him to apply it in new situations, as these applications lead to more understanding of theories and models. In the interrelationship between the science and technology curve, this may lead to an exploration of the next lesson. (Abdullah Muhammad Khataiba, previous reference, pg. 345-347)

6-Teaching planning according to the learning cycle strategy:

In order for the teacher to play his role in facilitating interaction within the classroom, whether between him and the students, or between students and each other, or between students and the experiences that he provides to them, whether sensory or logical, the burden of planning the activities of the learning cycle in all its stages falls on the teacher. Fuller, referred to in (Jassim 2001), explained that when planning to implement a lesson according to the stages of the learning cycle, the teacher follows the following steps:

-That the teacher, in light of his previous experience, formulate some of the problems and difficulties that will be included in the activities of each stage of the learning cycle, provided that the teacher takes into account, in the meantime, that the student has mental

abilities that enable him to overcome the challenges he faces during his practice for those activities.

The teacher defines the concept to be presented to his students.

-The teacher writes a list of all tangible experiences that can be provided, closely related to the concept previously defined, provided that this list contains the sensory experiences that the teacher expects his students to interact with in a reasonable manner, in addition to those activities that are directly related to the concept to be presented.

-By completing the previous step, the teacher is in the process of preparing for the next step - the stage of detection - and he has to choose the different tangible experiences in terms of form and closely related to the content that can be provided in the classroom. What is reasonably accomplished, it leads to more research on the various phenomena, all under the guidance of the teacher whenever necessary.

-Then comes the role of planning the activities of the stage of presenting the concept, and the teacher must consider what he did during the disclosure stage to reach the formulation of the concept to be presented through his discussions with the students, and in light of the relationships and assistance he provides to his students, they can reach the instructions intended by the teacher.

-The teacher should plan the activities of the application stage, including a set of sensory experiences with which the interaction of students is a direct application of the concept of learning. (Abdullah Muhammad Khataiba, previous reference, p. 350 – 351)

Conclusion:

The constructivist theory is a theory based on the idea that learning does not take place through the automatic transfer of knowledge from the teacher to the learner, but rather by constructing a meaning for the learner for what he learns by himself based on his previous experiences and knowledge. Several strategies have emerged from this theory, including the learning cycle strategy. One of the advantages of this strategy is that it takes into account the mental abilities of learners and pushes them to think. It is concerned with developing their thinking skills, provides them with the opportunity for self-learning and group discussion, and learning within different groups, and gives importance to the scientific content to be learned. It also provides him with the opportunity to acquire and practice various critical thinking skills and develop their attitudes towards academic subjects.

And the learning cycle is multi-stage (three, four, and five), and in this study we dealt with the five-stage learning cycle, and these stages are: the stage of preparation and preoccupation, the stage of exploration, the stage of interpretation, the stage of expansion and enrichment, and then the stage of evaluation. In each of the stages, the teacher and the learner have a special role for each of them. This strategy requires an organized planning of

the activities for each stage, and the teacher carries out this planning before implementing his lesson.

This strategy has proven its effectiveness in several different Arab and foreign studies in several dependent variables, including academic achievement, the trend towards science, and the acquisition of scientific concepts and different modes of thinking, including scientific thinking, critical thinking and innovative thinking...

References:

1 - Ayman Shalayel (2003), The Impact of the Learning Cycle in Teaching Science on the Achievement and the Survival of the Impact of Learning and Acquisition of Science Processes for Seventh Grade Students, Unpublished Master's Thesis, The Islamic University, Gaza, Palestine.

2- Nayef bin Ateeq Al-Sufyani (2010), the effect of using the learning cycle in teaching physics on the development of academic achievement and innovative thinking skills for the first secondary grade, an unpublished master's thesis in Curricula and Methods of Teaching Science, Umm Al-Qura University, Saudi Arabia.

3- Bushra Habad Al-Dhafiri (2010), the effect of the modified learning cycle strategy (E's5) on the achievement and creative thinking of fifth-grade female students in science, an unpublished master's thesis, specializing in curricula and teaching methods, Kuwait University.

4- Zaid Al-Adwan (2011), The Effectiveness of Using the Learning Cycle Strategy in Acquiring Geographical Concepts for Tenth Grade Students in Jordan, An-Najah University Journal for Research (Humanities), Volume 25 (10), Amman, Jordan.

5- Abdel Salam Mustafa (2001), Modern Trends in Teaching Science, 1st Edition, Dar Al-Fikr Al-Arabi, Cairo.

6- Ahmed Hussein Al-Laqani and Ali Ahmed Al-Jamal (1996), a dictionary of cognitive educational terms in curricula and teaching methods, 2nd edition, Alam Al-Kutub, Cairo.

7- Mostafa El-Tanawi (2002), Teaching and learning methods and their applications in educational research, Anglo-Egyptian Library, Cairo.

8- Salem Abdel Aziz Al-Khawaldeh (2007), The Impact of the Modified Learning Course on the Achievement of Secondary Grade Students in Science in Biology, Al-Manara Magazine, Volume 13, Number 3, Amman, Jordan.

9- Sadiq Munir (2003), The Effectiveness of the Constructive Model (Seven Es) in Teaching Science in Developing Achievement and Some Learning Process Skills for Second Year Preparatory Students in the Sultanate of Oman, Journal of Scientific Education, Volume VI, Number 3, Sultanate of Oman.

01-Abdullah Muhammad Khataiba (2005), Teaching Science for All, Edition 1, Dar Al Masirah for Publishing and Distribution, Amman.

11 - Zaid Al-Huwaidi (2005), Modern Methods in Teaching Science, University Book House, Al Ain, UAE.

12 - Ismail Muhammad Al-Amin (2001), Methods of Teaching Mathematics: Theories and Applications, 1st Edition, Dar Al-Fikr Al-Arabi, Cairo.

13- Renner, Joun & Abraham, Michael (1986), the Sequence of Learning cycle Activities in High School chemistry, Journal of Research in Science Teaching, Vol 23, No. 2.