

An Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods

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ABSTRACT: Teaching methods have undergone tremendous development in recent times. However, it is still observed that most teachers continue to rely on traditional methods based on rote instruction and memorization. Such methods are no longer compatible with the demands of the rapidly developing era. Therefore, teachers need to seek modern teaching methods that stimulate students' thinking and convey knowledge to them in ways that enable them to acquire knowledge independently in the future, such as the Think–Pair–Share method and the Concepts Map method. This article presents a teaching model designed around the integration of these two methods, along with the design of a science lesson that illustrates how this integration can be implemented.

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INTRODUCTION

Education occupies the top position in many countries around the world, given its significant role in the progress and development of nations. This importance has been reflected in the need to pay greater attention to the role of the school, which has shifted from simply transmitting information to students to helping them learn how to access and obtain that information themselves. This, in turn, has encouraged students to think and acquire skills that can be utilized in their real lives.

In order for the school to fulfill this role, it has become necessary to seek teaching methods that keep pace with the knowledge explosion and the rapidly accelerating developments. These methods should make the student an active learner and place them at the center of the educational process.

One of the teaching methods that emphasizes student activity is cooperative learning. It seeks to make the student active in constructing knowledge and developing concepts. It is also defined as a type of learning in which students work together in small groups, with each member helping the others to achieve a common educational goal. All members of the same group strive to reach the required level of mastery according to objective assessment criteria prepared in advance (Al-Fawwal & Suleiman, 2013, p. 441). Cooperative learning can be implemented through various methods, including the Think-Pair-Share Method, which was developed by Frank Lyman. It derives its name from its three stages: thinking, pairing, and sharing. In the thinking stage, the teacher stimulates students' thinking by posing a question, and students are given a few moments to think about it. The pairing stage involves students working in pairs to discuss the answers they have reached. They then compare their mental or written notes and identify the answers they believe are the best, most convincing, or most unique. In the sharing stage, the teacher invites the pairs to share their thinking with the rest of the class (Lyman, F., 1981).

In the era of modern technology, teaching methods have witnessed new developments, including presenting information through innovative approaches such as concepts map, which are used to express the interrelationships among ideas in order to achieve the highest possible level of understanding of information.

“Concept mapping is considered one of the applications of meaningful learning. It was introduced as a teaching method in the field of education by Novak and Gowin” (Al-Tanawy, 2002, p. 297).

According to Novak, concepts map are two-dimensional schematic representations in which the concepts of a subject are arranged hierarchically, progressing from the most inclusive and least specific concepts at the top to the least inclusive and most specific concepts at the bottom (Katout, 2009, p. 7).

Concepts map contribute to the development of thinking because students' representation of the conceptual structure they possess through a concepts map is related to their internal mental representations of concepts, the way in which these concepts are organized, and the relationships that connect them.

Given the importance of both the Think-Pair-Share Method and concept mapping, the researcher considered it necessary to integrate these two methods. This integration involves thinking, followed by pairing and drawing a concept map, and then sharing the ideas of each pair with the rest of the students.

Before discussing the model, it is necessary to provide a brief explanation of the Think-Pair-Share Method and concept mapping as follows:

Think-Pair-Share Method:

The Think-Pair-Share Method is one of the cooperative learning methods that places the student at the center of the educational process, requiring the student to work actively and think about what he or she is doing. It is also one of the methods used to activate learners' prior knowledge relevant to the educational situation and to elicit a response to a particular topic. After individually reflecting on and thinking about a problem or topic for a period of time, each pair of students discusses their ideas in order to solve the problem together. They then share their discussion with another pair of students regarding the same idea, after which they record the conclusions they have collectively reached (Zaitoun, 2007, p. 113).

Hussein (2013, p. 10) states that in the Think-Pair-Share Method, the teacher asks students to work in pairs to discuss and think together about the question or activity presented for approximately five minutes. The teacher then asks each pair, one after another, to participate by presenting the solutions and ideas they have reached concerning the activity under investigation. This Method is characterized by giving students an opportunity to reflect internally on their own and externally with their peers, as well as to think and review their ideas before answering, and subsequently to cooperate and share ideas and solutions collaboratively.

The Method has been defined by several scholars, including:

1. **Jaber:** It is defined as: "One of the cooperative learning methods that includes a thinking stage, during which the teacher asks students to think individually (for one minute), with walking around and talking not being permitted after the teacher poses a question related to the lesson. During the pairing stage, the teacher asks students to discuss what they have thought about in pairs. During the sharing stage, the teacher asks each pair to share with the whole class what they have discussed" (Jaber Abdel Hamid, 1999).
2. **Nasr:** It is defined as: "One of the newly developed teaching strategies derived from cooperative learning. In addition to incorporating group learning situations based on participation, it provides students with more time to think and use their prior experiences during the thinking stage and to assist another peer during the pairing stage" (Nasr, 2003).

Steps of the Think-Pair-Share Method:

The steps of this Method can be summarized as follows:

First Step: Thinking

The Think-Pair-Share Method begins when the teacher poses an engaging, thought-provoking question or a problem related to the lesson topic to the entire class in order to seek a solution. The teacher then asks each student to think individually about the solution to the proposed question or problem and gives them a specified amount of time for individual thinking. The amount of time allocated for individual thinking is determined according to the students' level of knowledge and the nature and degree of complexity of the question (Susan, 2001, p. 51).

Second Step: Pairing

The teacher asks the students to form pairs and discuss what they have thought about (a two-way discussion). Each student discusses and shares the ideas and answers reached during the thinking stage with the classmate sitting next to him or her. Each student attempts to clarify his or her viewpoint and convince the partner of the validity of the idea. They exchange opinions and ideas until they arrive at a common answer on which they mutually agree (Christine, 2001, p. 15).

Third Step: Sharing

In this stage, students verbally express their answers to the question posed in front of the class. The teacher invites them to share the ideas they reached through the two previous stages. Answers are collected by asking students to raise their hands. Depending on the time available, the teacher may ask only one-quarter or one-half of the pairs to share their responses (Gunter et al., 1999).

Benefits of the Think-Pair-Share Method:

The Think-Pair-Share Method has several benefits, as it helps students to:

- Construct their knowledge through pair and group discussions.
- Increase their motivation to learn and develop their confidence to participate.
- Reflect internally with themselves and externally with their peers, and think and review their ideas before answering.

- Organize their prior knowledge.
- Generate questions, engage in discussion, and reflect on the topics presented (Badawi, 2010, p. 464).

The Think-Pair-Share Method is one of the cooperative learning methods. It begins with the teacher posing several questions to the class concerning what has been explained, an activity, or a problem. Students are then asked to think individually about the question for one minute, while talking and moving around the classroom are not permitted during the thinking stage. After that, the teacher asks students to form pairs so that each pair can discuss and think together about the question presented. Finally, the teacher asks the pairs, one after another, to participate by presenting the solutions or ideas they have reached concerning the question (Al-Fawwal & Suleiman, 2013, p. 446).

Concepts Map Method:

Novak, as cited by Al-Shahrani (1999), defined concepts map as a set of organized facts, concepts, generalizations, and theories arranged hierarchically, in which general and abstract concepts are positioned at the top of the organization, followed by progressively less general concepts until reaching the specific information at the base of this hierarchical organization (Al-Shahrani, 1999, p. 8).

Concepts map were used as an instructional Method by Novak and Gowin under the framework of concept mapping. They consist of diagrams or schematic representations that connect concepts to one another through lines or arrows labeled with words known as **linking words**, which clarify the relationship between one concept and another. When constructing these maps, the most general and comprehensive concepts are placed at the top of the diagram (the hierarchy) or map, followed by progressively less general subordinate concepts down to the base, with links showing the relationships among them (Abdel Salam, 2001, p. 130).

Definition of Concepts map:

Qatami and Al-Rousan (2005) defined concepts map as: "A method that aims to help students generate meanings from learning materials. It is an approach through which the cognitive structure of information that develops in the student as a result of developmental experience is organized." Concepts map perform a cognitive function that can be identified as follows:

1. A process of cognitive organization.
2. A process of generating meanings in the student's mind.
3. A process of linking concepts together in relationships that lead to meaningful concepts.
4. A process in which cognitive structures are organized according to the learner's developmental stage (p. 13).

Schau, as cited by Qasim (2010), defines concept mapping as a model that identifies the cognitive processes through which knowledge can become usable by long-term memory. It is one of the tools for interconnected understanding (p. 83).

From the above, it can be concluded that concepts map are visual diagrams or schematic representations that show the hierarchical relationships organizing concepts and clarify the relationships among them. These maps are used as a modern teaching method.

Importance of Concepts map:

Concept mapping represents a cognitive approach in which a concept is analyzed and constructed independently, allowing the student to develop toward achieving the goal of constructing meaning. Meaning is connected to the process of understanding, which constitutes a continuous motivation for organized learning in school. Al-Khalili et al. (1996), as cited by Abdel Salam (2001), indicate the importance of concepts map as follows:

1. They help connect new concepts with the student's cognitive structure.
2. They help students search for relationships among concepts.
3. They help teachers and students focus on the main ideas of a concept.
4. They help teachers identify students' level of understanding.
5. They help teachers measure higher-order thinking levels according to Bloom's taxonomy, including analysis, synthesis, and evaluation (p. 131).

Plotnick (1997) identifies the importance of concepts map as follows:

1. Helping students integrate old and new information in an explicit manner.
2. Helping students generate ideas and communicate complex ideas (p. 2).

The preceding definitions and descriptions demonstrate a general agreement that concepts map are of considerable importance. They contribute to the development of learning and learning planning, enhance the processes of teaching and learning, and enable teachers to identify students' cognitive structures and determine the main frameworks of the learning process.

Steps for Constructing a Concepts Map:

Constructing concepts map involves several systematic steps aimed at developing a hierarchical representation of knowledge concerning a particular topic. Novak, as cited by Al-Najdi et al. (2003), presents these steps as follows:

Step One: Selecting the Topic

Select the topic for which the concepts map is to be constructed. This may be a page or a lesson.

Step Two: Analyzing the Content

Analyze the content of the selected topic or unit in order to identify the general concepts.

Step Three: Arranging the Concepts

Arrange the concepts to construct the concepts maps follows:

1. Arrange the concepts from the most general at the top of the map, followed by the less general concepts and then the specific concepts. In other words, the abstract or most highly abstract concepts are placed at the top of the map, followed by the less abstract and then the concrete concepts. Thus, the vertical axis of the map illustrates the progression of concepts. Concepts are written inside geometric shapes, such as circles, squares, or rectangles.
2. Concepts that have the same degree of generality, specificity, or abstraction are placed at the same horizontal level, while concepts that are related to one another are positioned close to each other.
3. Examples are placed at the bottom of the map at the end of each branch. These examples clarify the concept represented by the corresponding branch and support the map. Examples are not placed inside the geometric shapes used for concepts.

Step Four: Establishing Relationships among Concepts

Establish links between the concepts and label these lines in a manner that clarifies the ideas, as follows:

1. Lines, rather than arrows, are used when connecting higher-level concepts with lower-level concepts.
2. One-directional arrows are used when connecting lateral concepts. These arrows indicate the integration of relationships among concepts and therefore represent a higher level of meaningful learning while encouraging learners to engage in innovative thinking.

Step Five: Adding Linking Words

Words expressing the connection or relationship between different concepts are written on the linking lines (pp. 434–436).

An Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods:

An Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods can be represented through the following steps:

1. First Step: Thinking

In this step, the teacher stimulates students' thinking by posing questions or presenting pictures, videos, situations, or a set of concepts. The teacher then allows sufficient time for each student to independently respond to the questions presented.

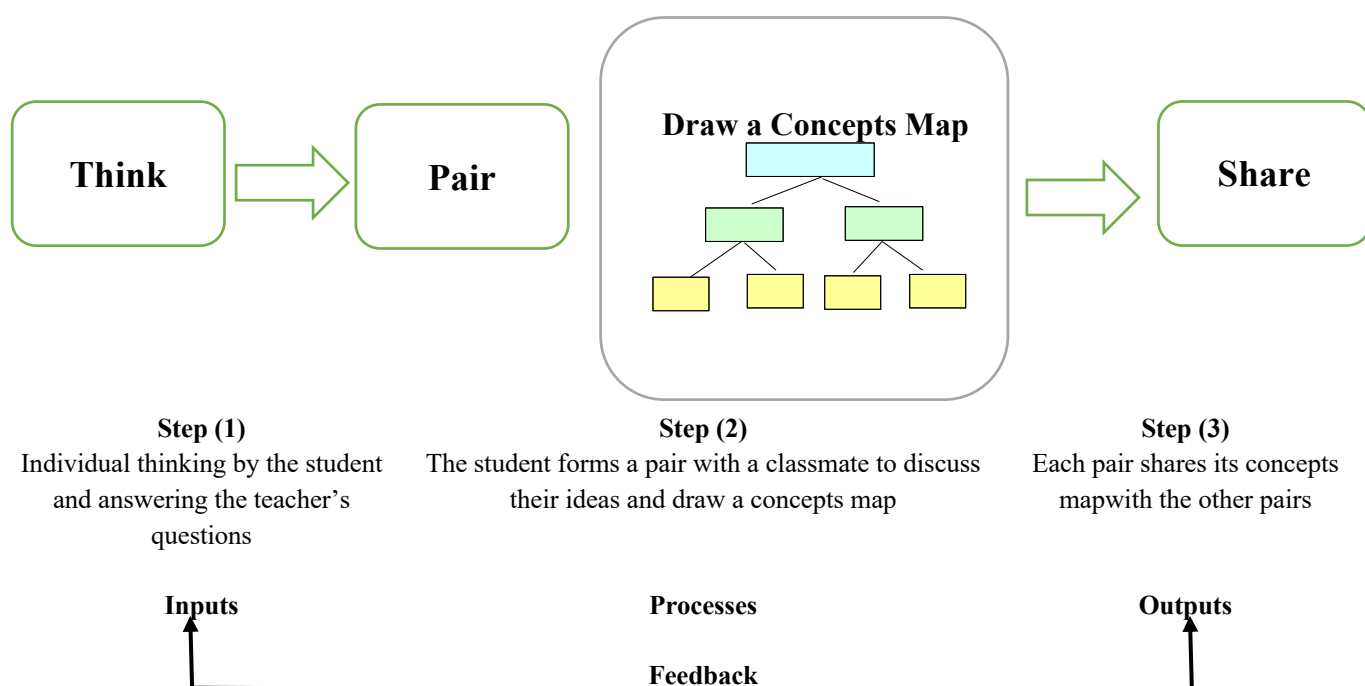
2. Second Step: Pairing

At this stage, the teacher asks the students to form pairs, with students seated together, and to share the answers reached during the Think stage. They then agree on specific answers to the questions and construct a concepts map representing those answers.

3. Third Step: Sharing

At this stage, each pair shares the concepts map they have constructed with the other pairs.

The following figure illustrates the model for integrating the two Methods according to the Systems Approach:



It can be seen from the previous figure that the systems approach was used in designing the model, as follows:

1. Inputs:

The objective of this step is to:

- Ask students to engage in individual thinking in order to answer the teacher's questions and complete the worksheets.

2. Processes:

This step has two objectives:

- The teacher asks each student to form a pair with a classmate to discuss their ideas.
- The students construct a concepts map through discussion with their partners.

3. Outputs:

The objective of this step is to:

- Ask each pair to share the concepts map they have constructed with the other pairs.

4. Feedback:

The objective of this step is either to modify and correct what the students wrote during their individual thinking, or to modify and correct the concepts map while it is being presented to the other pairs.

Lesson Plan According to the Integration of the Think-Pair-Share Method and Concept Mapping:

Lesson Title: What Is the Environment and What Are Its Components?

General Objectives of the Lesson:

- To identify the concept of the environment and its components.

Specific Learning Objectives:

By the end of the lesson, the student is expected to be able to:

1. Define the environment accurately.
2. Correctly enumerate the components of the environment.
3. Accurately give an example of the living components of the environment.
4. Accurately give an example of the non-living components of the environment.
5. Correctly classify the components into living and non-living components.

Expected Skills to Be Acquired:

Reading pictures – distinguishing – classifying – drawing a concept map.

Lesson Materials and Requirements:

Whiteboard – textbook – computer – a short film containing a collection of pictures of gardens and their components – pictures of camels, fish, a water pond, and palm trees – worksheets – final lesson assessment sheets.

Lesson Procedures

Motivation and Engagement:

I present a short film, approximately two minutes in length, using a computer. The film contains a collection of pictures of gardens and the components found in these gardens, as well as pictures of some living organisms. I then ask the following questions:

What did you see?

(A collection of gardens.)

Who among you has visited a garden?

What can be found inside the garden?

(Toys – animals – trees.)

Where do you live with your family?

(In a house.)

The place where living organisms live is called the **environment**. This is what we will learn about in today's lesson, in addition to its components. I then write the lesson title on the board.

Lesson Procedures:

I present an educational video about the environment. Then, I display a collection of pictures of camels, fish, a water pond, and palm trees, and ask the students to observe them carefully. I then pose the following questions:

What did you see in the pictures?

Where do the organisms shown in the pictures live?

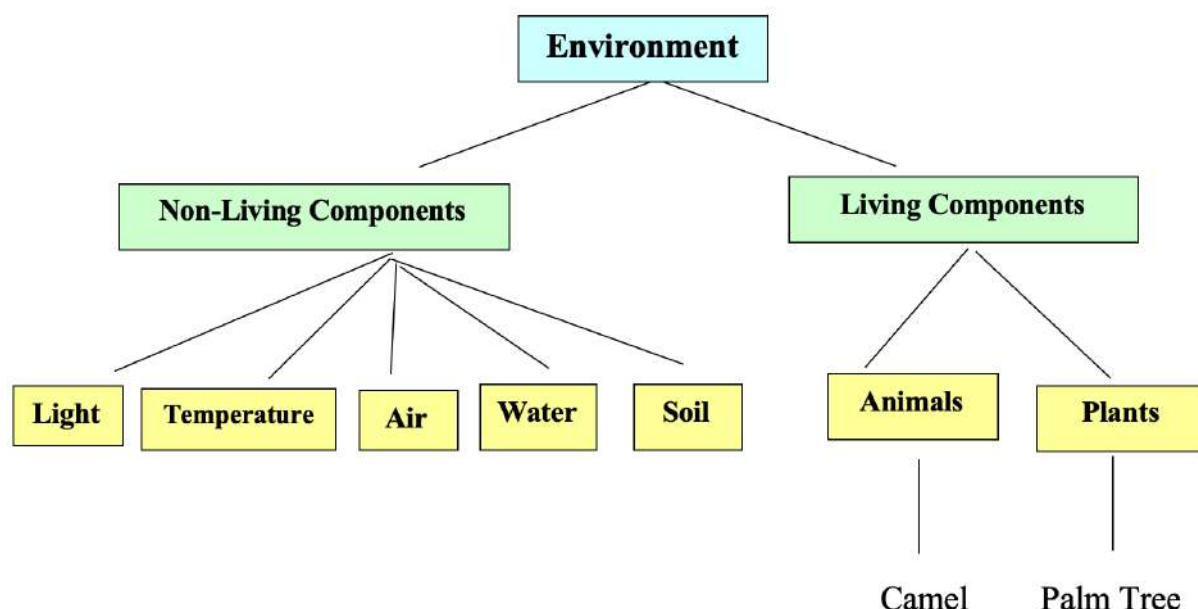
Are all the organisms in the pictures similar?

Do all organisms live in the same environment?

I then distribute **Worksheet (1)** and ask each student to think individually about the questions presented and answer them.

When the allotted time has elapsed, I ask each student to form a pair with a classmate, with each pair constituting a group. I ask each student to discuss with his or her partner what they have thought about and the answers they provided on **Worksheet (1)**. The students then reach an agreement on the answers and record the agreed-upon responses on **Worksheet (2)**, while also constructing a concept map.

After that, I ask each group (pair) to share its concepts map with the other groups (pairs). (**One-quarter or one-half of the pairs are selected for discussion.**) The concepts map is discussed by the students and the teacher, after which I draw the **correct concepts map**.



Final Lesson Assessment:

Complete the following blanks:

- The non-living components of the environment are:,, and
- The living components of the environment are:,, and

Lesson Closure and Extension:

We have discussed the environment and its components. Who can tell me what the components of the environment are? In the next lesson, we will discuss the different types of environments, the characteristics of each environment, and the organisms that live in them.

Homework:

I ask the students to complete the exercises and activities on page 83 of the textbook.

Worksheet (1)

Think and Then Answer:

1. Based on your observation of the video clip about the environment and your observation of some pictures, define the concept of the environment.

The environment is:

.....

2. You have the following pictures. Observe them carefully and then answer the questions:



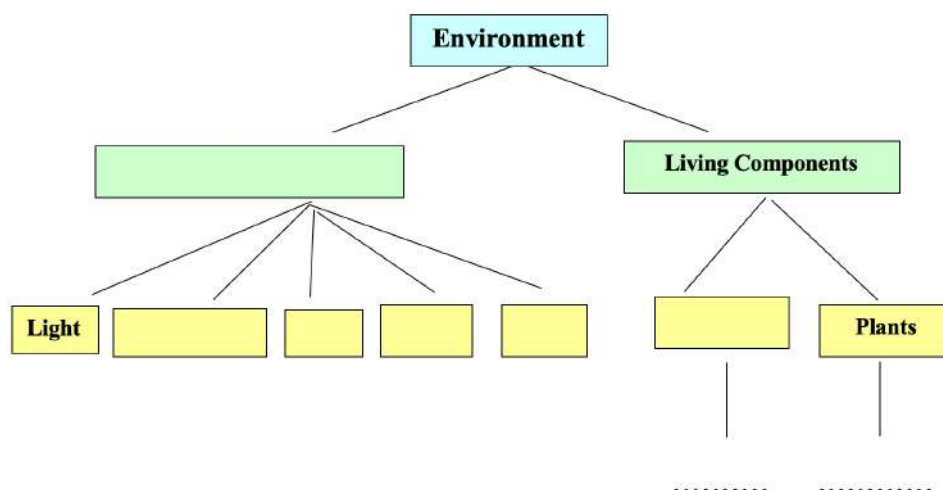
1. What are the names of the organisms shown in the two pictures?
2. Where do they live?
3. Are they components of the environment?
4. Are they classified as living or non-living components?



1. What are the names of the organisms shown in the pictures?
2. Are they components of the environment?
3. Are they classified as living or non-living components?

Worksheet /2/

Discuss the information you wrote on the first worksheet with your partner, and then complete the following concept map:



Research Recommendations:

- Adopt the An Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods for use across all grade levels and academic subjects.
- Conduct training courses for teachers on the Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods to enable them to use it effectively in their teaching.
- Organize the classroom environment and equip it with appropriate educational resources, technologies, and material and non-material resources in a manner consistent with active learning strategies.

CONCLUSION

Given the lack of effectiveness of traditional teaching Methods in the educational process, as confirmed by the findings of numerous studies, and in response to recent trends calling for the development of teaching methods that meet the demands of rapid developments and enhance students' active participation, the researchers explored a modern, flexible, and appropriate teaching method that would be compatible with the actual teaching context in schools, on the one hand, and with students' educational needs, on the other. Accordingly, the researchers selected An Integrated Teaching Model Based on (Think-Pair-Share) and Concepts Map Methods, as this integration may contribute to making teaching more effective. Both strategies may facilitate students' understanding and acquisition of knowledge in a simple and accessible manner. Moreover, their integration does not require advanced technological resources, high financial costs, or procedures that exceed students' ability to understand and apply them.

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