

## RESEARCH ARTICLE



# The status of concept mapping in teaching learning process: Exploring the present awareness, use and challenges

## OPEN ACCESS

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## Abstract

**Aims:** To explore the present status of concept mapping in teaching and learning process in India. Also, to find answers of certain questions pertaining to the usage, awareness and present status of concept maps in real life education. Further to provide some recommendation for the teaching learning process. **Method:** In this study, the researcher developed a questionnaire using google form containing 14 items. The items were revolving around the concept map and its practical usage in teaching and learning process. The questionnaire was sent to 200 teachers in the month of June, 2020; out of which 80 responses were received back. All the teachers are teaching in various school of the country. The types of schools included private, government, rural and urban. The region covered for data collection was mainly Delhi, however some respondents were from other parts of India also. The data was analyzed qualitatively and quantitatively. Ms. Excel was used for quantitative analysis. **Findings:** The study indicated that there is an awareness of concept mapping among the teachers. There are several teachers who are using concepts maps in their regular teaching learning process. Many of them learn concept maps when they were students. The use of concept maps is always considered to be effective in the classroom. However, there were some respondents who found making and implementing concept maps time-consuming and effortful. All opined that concept maps are in use and found effective in the teaching learning process. **Novelty:** The study investigates the status of uses of concept maps in teaching learning process. It also throws light on the problems faced by the teachers in using concept maps; hence the study contributes to plan the school-time table, curriculum and other activities. Moreover, the study provides basis for further in depth study pertaining to problems faced by teachers in using concept maps.

**Keywords:** Concept mapping; awareness; usage; teaching; learning; education; concept maps; purpose of concept maps; challenges

## 1 Introduction

Psychologists have been working on the learning process especially how the concepts are formed in human. When a child is exposed to the environment surrounding him, he tries to know about so many things. He has previous knowledge which he wants to relate with new situation and new concepts. During this process he interacts with many people who are more experienced. He gets receptive knowledge and discovery knowledge. In both the knowledge language plays an important role.<sup>(1)</sup> has identified two kinds of learning known as Rote learning and meaningful learning. Rote learning is just learning the facts by heart while meaningful learning is learning with the help of previous knowledge. Previous knowledge when linked to the new situation and new learning, it forms meaningful learning. It can be placed in long term memory to facilitate further learning.

For meaningful learning, new knowledge or learning has to be placed in the memory. Human memory has three stages that is attending to new information, retaining information and retrieve or recall the information. It stores the information in the form of cognitive structures. These structures are not physically visible but can be manifested in the form of maps when a child tries to make concept maps. These maps have concepts, linking words and proposition. A concept map is simply a kind of diagram that displays the relationships between concepts. The idea was originally developed by Novak<sup>(2)</sup>. “It is a schematic device for representing a set of concept meaning embedded in a framework of propositions”<sup>(3)</sup>. These are graphical tools for organizing and representing knowledge. A Concept Map is a mental presentation of schemas that an individual has in his memory. These may help a learner to memorise a specific content in a meaningful way which can be applied in a novel situation.

According to<sup>(4)</sup> concept maps are mainly made up of the following constituents:

### 1.1 Concept

A concept can be defined as a perceived regularity (or pattern) in events or objects, or records of events or objects, designated by label. In a concept map concepts are usually enclosed in circles or boxes of some type.

### 1.2 Linking words

Words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts.

### 1.3 Proposition

Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts connected using linking words or phrases to form a meaningful statement. These connected terms can be read as a sentence, such as “India has democracy.” These sentences—two terms linked by an arrow and phrase—are called propositions.

Concept maps can be used in teaching learning process in several ways like in learning, teaching, evaluation etc. As a concept map is a precise pictorial representation of concepts, it takes less space in making and less time in revising the same. It helps students in making concise notes in diagrammatic form. For teachers, it helps in making short notes for explanation, and conveying the concepts clearly and diagrammatically. Any misconception among the students could be easily understood with the help of concept maps. Thus, the extent of clarity of concepts can be recorded by using concept maps as evaluative tools.

## 2 Need and significance of the study

As far as the effectiveness of concept maps are concerned, there have been various researches regarding the same, and have proved its effectiveness in teaching learning process. Based upon these researches ‘concept mapping’ has been included in the curriculum of B.Ed course in some universities e.g. GGSIPU and IGNOU. So that the prospective teachers can get aware about the technicalities of making the concept maps and use it in their future for various purposes. There have been many student teachers who have done B.Ed programme and have gone through the curriculum which includes developing concept maps. On the basis of personal experience, the researcher as a teacher educator feels that there is lack of use of concept maps among the teachers. The researcher wanted to clarify the doubt in scientific manner through research. Moreover, it would give a clear picture of present status of concept mapping in teaching learning process. So the present study was conducted to find out answers to the following broad research questions:

## 3 Research questions

1. What is the present status of concept mapping in teaching learning process in India?

2. What are the challenges is using concept map as a pedagogical tool?

## 4 Objectives

1. To explore the use of concept maps in teaching learning process.
2. To study the awareness of teachers about concept maps.
3. To know the readiness of teachers in using concept maps.
4. To find out the extent of usage of concept maps in teaching-learning process.

## 5 Methodology

It is a descriptive study in which a survey method was used to collect the data. The researcher made a questionnaire containing 14 items related to concept mapping in teaching learning process. The responses were analyzed qualitatively and quantitatively. The population of the study comprises all the teachers who did B.Ed programme with concept mapping as a part of curriculum. To recognize such teachers the respondents were mainly those who did the programme from Guru Gobind Singh Indraprastha University, Delhi or IGNOU. Further, in the questionnaire there was an item which sought information regarding the same i.e. if respondents had gone through a curriculum which included concept maps as a component therein. The sample consisted of 80 teachers who are engaged in teaching learning process. 46 respondents were of 20-25 years age group, while 28 respondents were of 25-30 years age group, and 6 respondents were of 30-35 years age group. All the respondents fall under the age group of 20-35 years. As far as gender is concerned, 80% of the respondents were female while 20% of the respondents were male. The region covered for data collection was mainly Delhi, however some respondents were from other parts of India also. A Questionnaire was developed by the investigator with the help of google form. It consisted of 14 items based upon different aspects of concept maps like use, purpose, challenges and scope. The questionnaire was sent to 200 teachers out of which 80 responses were received back.

## 6 Analysis of Data

The analysis of the data was done by analyzing the responses made by the respondents against each question.

### 6.1 Use of concept maps in teaching learning process

The data showed that there were 14 respondents out of 80 who used the concept maps in the current month in which the data was being collected. While 20 respondents reported that they used it in the previous month. Thus, if we add both it will be 34 in total that is 42.5% of total who were using concept maps somehow in a span of a month which could be considered as being used recently. There were 32 respondents that was 40% of sample who used concept maps previous year. While 6 respondents never used it.

**Table 1.** Responses to the question- When did you use concept maps recently?

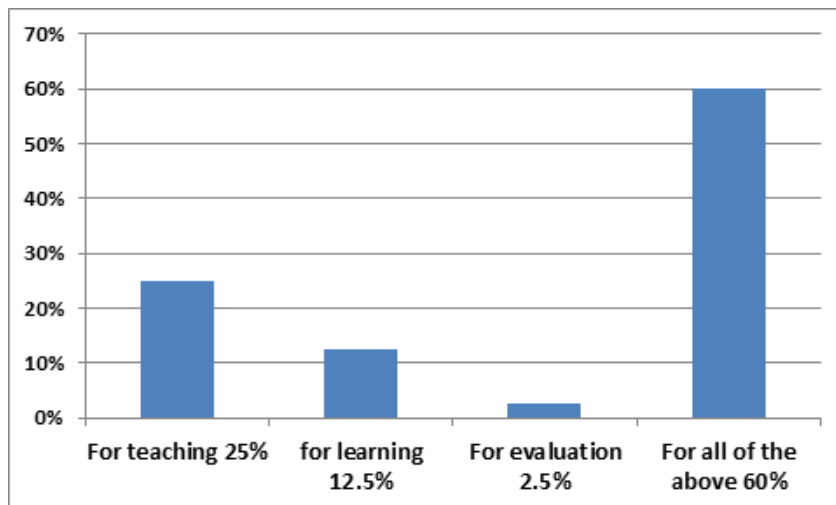
Options	Count	Percentage
This month	14	17.50%
Last Month	20	25.00%
6 months ago	4	5.00%
Last year	32	40.00%
Never	10	12.50%
None of the above	0	0.00%
TOTAL	80	100%

In another item when they were asked if they had been ever taught with concept maps, 82.5%, which counted 66 respondents, answered in positive, while 12.5% responded in negative and 5% of the sample could not decide if they were taught with concept maps. Through this item it was clear that most of the respondents were taught with concept maps which proves that their teachers must have used it, and they have an understanding of the concept maps.

While answering the question regarding the purpose of using concept maps, most of the participants i.e. 60% reported that they used concept maps for teaching, learning and evaluation. However, there were 2.5% of the respondents who said that they use it for evaluation only.

**Table 2.** Responses to the question- If they were taught with the help of concept maps

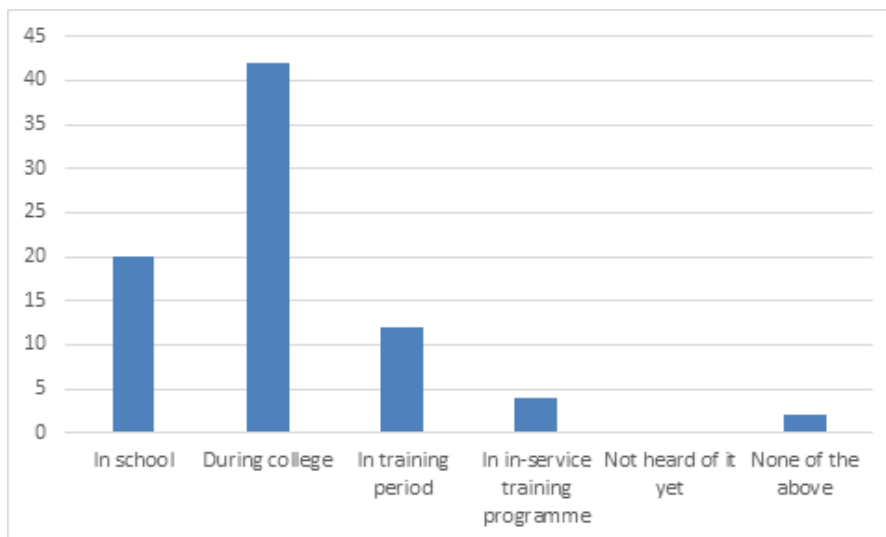
Options	Count	Percentage
Yes	66	82.50%
No	10	12.50%
Can't say	04	5.00%
TOTAL	80	100%



**Fig 1.** Purpose for using concept maps

## 6.2 Awareness of people about concept maps

In answer to the question as when they come to know about the word “concept map”, the maximum of the respondents, 52.5%, accepted that they heard of it during college, while 25% reported that they had heard about it during school. By looking at the data it could be concluded that there were no respondent who had not heard of the term concept maps. So it could be said that almost all the respondents were exposed to the term.



**Fig 2.** When 'concept map' was heard for the first time

### 6.3 Readiness of teachers in using concept maps

When respondents were exposed to the question related to the extent of usefulness of concept maps, maximum of the respondents that was 80%, agreed that concept maps are useful to a great extent for teaching learning purpose. While 12.5% said that it is useful to some extent. It shows that most of the teachers think that it is useful and effective in teaching learning process. The data such received reflects that the attitude of the respondents is positive towards the concept maps.

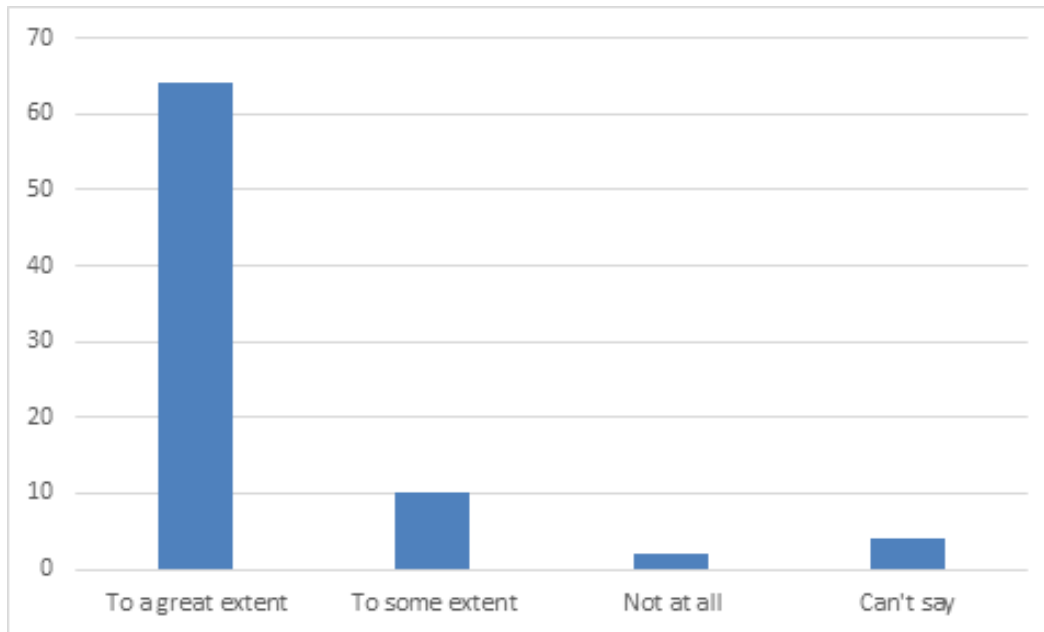


Fig 3. Usefulness of concept maps in teaching learning process

### 6.4 The extent of usage of concept maps in teaching learning process

To know the constraints if any in using concept maps, there was an item in the questionnaire which sought information regarding the effort used in making concept maps. The most of the respondents, that made 62.5% of total sample, said that it was effortful to a great extent, while 27.5% responded as “to some extent”. There were only 5% of the total respondents who said that making concept maps is not at all an effortful activity. Thus, the data revealed that most of the people think it to be effortful work.

Table 3. How effortful making concept maps is

Options	Count	Percentage
To a great extent	50	62.50%
To some extent	22	27.50%
Not at all	4	5.00%
Can't say	4	5.00%
TOTAL	80	100%

When respondents were asked to share if there is anything that hinders from using concept maps in teaching learning process then they answered in varied manner. Some of the respondents indicated that it requires clarity of the concepts included in the topic and technical knowledge to make the concept maps, some respondents said that when the concept is long and complicated then it is difficult to use concept maps for the same. Some of them reported that there was lack of time to prepare concept maps. However, there were 37% of the respondents who said that there were no any such things which stopped them from using concept maps.

## 7 Major findings and discussion

The study found that there is an awareness of concept maps among the teachers. 92% of the sample considered it as an effective tool of teaching and learning. This finding is supported by various studies which showed that the use of concept maps and collaborative concept mapping has laid positive impact on the achievement of the students of various classes and programs in higher education. According to <sup>(5)</sup> concept maps bring positive change among the higher secondary student of Biology. The students who were taught with concept maps achieved higher score in post test of the achievement test. <sup>(6)</sup> also found that teaching through concept mapping is more effective than teaching through lecture cum discussion method. According to <sup>(7)</sup> utilization of the concept map method in teaching History was able to raise students' achievement significantly for multiple choice type questions.

It was also found that 87% teachers of the study were using concepts maps in teaching learning process but not regularly. 45% teachers have not used the concept map for at least last 6 months so it can be said that teachers are using the concept maps as a pedagogical tool but occasionally. The possible reason of such situation is also revealed by the study that making concept maps and implementing them is not easy for all. There are some constraints like lack of clarity of concepts, lack of technical knowledge required for concept mapping, lack of time and lack of interest for the use of concept maps. A research by <sup>(8)</sup> also opined that there are some certain challenges in integrating concept mapping in teaching learning process. The respondents of the study mentioned that it requires effort, time and willingness of teachers. In <sup>(9)</sup> also concluded that concept mapping aims at the teaching and learning of concepts at "understanding level" in a meaningful way. Summarily it was found that teachers are aware about the concept maps and these are in use, however there are some constraints in using it in teaching learning process.

## 8 Conclusion

The findings showed that concept maps are effective in teaching learning process. The teachers accepted that concept maps are effective but its usage of them is not as regular and frequent as it could be. The need of comprehensive knowledge, complication in mapping process, lack of time may be some of the constraints behind less use of concept maps. The data shows that once concept maps made can be used frequently to make teaching learning effective. This also suggests that there should be concept maps sharing among the students and teachers. The study recommends that there should be sufficient time so that teachers could prepare concept maps. There could be modifications in school curriculum and time table to facilitate teachers for better preparation and use of concept maps. Viewing that concepts map is always effective in teaching learning process, school can decide its use desirable or compulsory in each topic at least once.

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