Concept Mapping: An Influential Factor

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Abstract: Today, learning another language has become quite popular. Although learning and teaching a foreign language is not a new field, but like any other filed of science it is still experiencing a lot of problems, and teachers are looking for new solutions to overcome this task with much more success. As instructors we are placed in the middle of the challenging position of making the lesson meaningful to our learners. This will be fulfilled by introducing concept maps into the curriculum of the students. Recently, the appropriate time for introducing concept mapping into the education is suggested to be early in education. The present study aims to review the benefits of teaching and creating concept maps to make EFL students learn much more easily.

Key words: foreign language; meaningful learning; concept maps; EFL

1. Introduction

As instructors, we are often situated in the challenging position of making the knowledge, existing in the text books assigned for the course, comprehendible to our learners in a way that makes sense and is useful to them. In this regard, we have to understand both 1) how will they will be useful/helpful to the learner, and 2) how to relate the new knowledge to the students previous knowledge in order to make the meaningless information meaningful to them. Although, it takes time to fulfill both areas, this will help the instructor to understand the purpose of teaching and fulfill the needs of the audience in a better way. The latter is based on a major element in education, which is based on what the learner already knows.

2. Literature Review

2.1 Concept Mapping

Concept maps are graphical instruments that are used for organizing and representing knowledge. They consist of concepts, usually positioned in some form of circles or boxes, and the relationships between concepts are shown by a connecting line linking two concepts. Words on the lines, referred to as linking words or linking phrases, show the relationship between the two concepts (Novak & Cañas 2008).

In 1972 concept mapping was for the first time introduced by Joseph Novak to broaden concept learning in science education. Ausubel's assimilation learning theory (1963; 1968 cited in Maas & Leauby, 2005) mostly influenced Novak's work and founded the base for the learning theory from which concept mapping was born. In perhaps the most classic concept mapping research published, Novak and Gowin (1984) defined concept mapping as an instrument for education which was developed for the teacher and learner to point into the learner's cognitive structure to examine the learners' knowledge.

The concept mapping is claimed to lead (Clayton 2006) to meaningful learning and has been used for more than 25 years as an important tool for meaningful learning in (Wheeler & Collins, 2003) educational settings (cited in Nirmala & Shakuntala, 2011).

It is a skill which enables the expansion of the students' thinking skills through more meaningful learning activities. Enabling is related to that skill which when learned, can help students arrange what they know and think in much more complicated ways (Maas & Leauby, 2005).

Concept maps are those mental relationships and connections of the structures which the student makes based on the learned knowledge demonstrated in the form of drawings or diagrams (Angelo and Cross, 1993; cited in Maas &Leauby, 2005). Mintz , Wandersee, & Novak (1998, cited in Kharatmal & Nagarjuna, 2010) mention that it is a simple graphical form of knowledge representation method which is comprised of nodes (concepts) and arcs (linking phrases). In the most ordinary form, a concept map

includes only two concepts which are connected by a linking word (Novak and Gowin, 1984).

Concept mapping is a technique which is related to teaching and learning and establishes a bridge between the way people learn knowledge and cognizant learning. Students need to have a good base and a critical thinking about concept mapping and the relations between different concepts. Concept mapping claims to be helpful in increasing meaningful learning and students' conceptual understanding in Science and Physics (Novak and Gowin, 1984). On the contrary, positive feelings are also usually helpful in connecting new information to existing knowledge in a meaningful way. Concept mapping is useful in helping teachers to teach and students to learn more meaningfully.

Although concept maps have proved to have significant effect in education (Mintzes, Wandersee, & Novak, 1998, cited in Kharatmal & Nagarjuna, 2010), it has been critiqued by the knowledge representation community for being informal (Sowa, 2003; Kremer, 1997). A survey of four different types of knowledge representation models (Sowa, 2006), which concept maps were one among them, claimed them as being informal. Although they can easily be constructed, the maps made by various persons of the same domain usually do not match. This is usually because of different linking phrases, although the chosen concept names are mostly the same. Although this may serve as the purpose of extracting the knowledge of the learner, usually because of the lack of rules the propositions cannot express the intended meaning since the linking phrases are chosen from natural language. It is clear that this prevents them from being suitable for a formal representation (Canas & Cravalho, 2004), but also the overt use of linking phrases does not lead to strictness in representation of scientific knowledge (Kharatmal, & Nagarjuna, 2006).

Concept maps include meaningful prepositions, connecting words, cross links and relevant (Steele, 2007) examples. Among these, the cross links are responsible for the development of critical thinking or meaningful learning which connects different vertical (Protzman, & Raval, 2004) linkages in the conceptual structure. The prepositions can be rote learned while the cross links relate concepts in different domains that advance the non – linear thinking which is a necessary aspect of critical thinking (cited in Nirmala & Shakuntala, 2011).

2.2 Meaningful Learning

Research in cognitive science has proved that whenever students are active and relate new knowledge to relevant ideas that they already know, learning is meaningful (Canas, Hoffman, Coffey & Novak, 2003). Such research is based on Ausubel's (1968, cited in Koc, 2012) assimilation theory of learning, which puts the importance of individuals' existing cognitive structures into effect in being able to learn new concepts.

Usually students' ability in developing to think in more creative and meaningful ways is limited. They are mostly not qualified in how to connect new concepts and ideas to previous knowledge. This model becomes even worse over time. When the students' current knowledge frameworks are neither strong nor organized they become less capable to learn and apply more complex knowledge and concepts. Novak (1998) observed that the more one learns and arranges knowledge in a given field using the knowledge in that domain would be much easier. Novak also mentions that when learning in a domain in which one knows little or what he knows is not properly arranged meaningful learning will be difficult and usually tiring and time consuming.

In many instances, one may escape the challenge by using rote learning, even though it is known that what is learnt will soon be forgotten and it will have no value in future learning (Maas, & Leauby, 2005).

2.3 Characteristics of Concept mapping

Normally concept maps are represented in a hierarchical way with the most comprehensive, most general concepts at the top of the map and the more specific, less general concepts arranged by rank below (Novak & Cañas, 2008).

The second important characteristic of concept maps is the existence of *cross-links*. These are connections or links between concepts in different portions or fields of the concept map. Cross-links help us see the way a concept in one field of knowledge shown on the map is connected to a concept in another field demonstrated on the map. In creating new knowledge, cross-links often show creative moves on the part of the producer of the knowledge. In order to facilitate creative thinking the hierarchical structure which is shown in a good map along with the ability to search for and show new cross-links are important (Novak &Cañas, 2008).

Besides specific examples of events or objects that help to make the meaning of a given concept clear is another characteristic of concept maps. Usually these are not presented in ovals or boxes because they are specific events or objects and do not show concepts (Novak & Cañas, 2008).

2.4 Importance of Creating Concept Maps

Novak (1990; cited in McClure, Sonak, & Suen, 1999) mentioned four uses of concept maps: "as a learning strategy, as an instructional strategy, as a strategy for planning curriculum, and as a means of assessing students' understanding of science concepts"(p. 475).

Concept mapping as a strategy in education is parallel with the movement from teacher to learner and as a result has the power to improve academic achievement (Peterson & Snyder, 1998). Therefore, learners should be taught and motivated to create concept maps (Laight, 2004). The important point is that the beginning stage of drawing a map not only needs active participation of the learner in the learning process but also paves the way on

their understanding of a specific learning area. As a result, such information about learners' understanding empowers facilitators to determine learners' cognitive deficiencies and provide corrective feedback (Nowruzi Khiabani & Nafissi, 2010).

Concept mapping has also been shown to increase the learners' writing ability Gorjian, Pazhakh, & Parang, 2012). This improvement has been demonstrated in terms of the quantity and quality of producing, arranging and relating ideas (Pishghadam & Ghanizadeh, 2006). Ebrahimi and Ebrahimi (2012 a) also mention that in writing if the students are able to relate new information to their existing information their writing skill will improve. In this regard, Ebrahimi and Ebrahimi (2012 b) mention that textual theme awareness can also lead students towards creating cohesive texts. Moreover, in this way they can organize the message in the clauses, create texts, and create a local environment in which the readers can interpret their text.

Another research performed by Jegede et al. (1990) showed that the use of teaching strategies like concept mapping and problem solving increases achievement and reduces both male and female students' anxiety (cited in Nnamdi & Okechukwu, 2006) (which has an important psychological role in language students learning as mentioned by Izadi & Atasheneh, 2012).

Moreover, giving students more chance to get involved in the learning process through the use of concept mapping and problem solving skills makes them perform significantly better than their counterparts who have been exposed to the teaching using the usual traditional lecture method of teaching (Nnamdi and Okechukwu, 2006).

It has also became clear that for students who have some concept mapping experience, there exists a correlation between their concept mapping ability and performance in achievement test (Chee and Wong, 1996).

Concept mapping has also proved to be a useful vehicle to fill the usual gap between theories and practice (Sutherlang & Katz, 2005). Besides, informality makes them easy to be learned (Sowa, 2006).

Access of representation as a given situation in learning is also helped through concept maps (Bruillard, et al., 2000). They have also been proved as useful tools in lesson design, and can determine the key concepts and their relationship, and build the whole curriculum as a content analysis tool in itself (Kaszas, Turcsanyi-Szabo, 2003). Another very powerful use of concept maps is as an evaluation tool, thus encouraging students to use meaningful-mode learning patterns (Novak, 1998; Novak & Cañas, 2008; Novak & Gowin, 1984).

Concept maps can be used as a dependable, current assessment method and as a research tool, which gives a great advantage on academic studies (Novak and Gowin, 1984).

2.5 Problems with Concept Maps

It has also been mentioned that informality and undisciplined use can create concept maps that are even more ambiguous than an English sentence. Mapping a sentence fragment to a path of several nodes is a typical error. Even implicit relations which are shown by English syntax can be ignored. Moreover, trying to express characteristics of logic which cannot be expressed in a simple network is another error (Sowa, 2006).

3. Conclusion

Concept maps enable the instructors to simplify and present theoretical ideas on graphical content. This tool will prevent memorizing, which is very common method on our education system and will encourage and advance sensible learning. Sensible learning builds a logical meaning between the new information that has learned by previous education and establishes a complete meaning on the part of the learner, while memorizing learning creates misunderstanding or inability to build a connection between the students' previous and new learned knowledge (Novak, 1998). Therefore as Pishghadam and Ghanizadeh (2011) and Fahim and Tabataba'ian state concept maps are ought to become part of any education and assessment and must be used in classroom settings. But we should be careful as working with concept mapping activities, for short time work seems to have no effect on student's attitudes towards the subject content (Chee and Wong, 1996) while long-term use can lead to improving critical thinking in clinical setup (Nirmala & Shakuntala, 2011).

Since the use of concept mapping in many studies has shown positive effects on some measurements and no major negative effect has been reported, it is suggested that concept mapping can be a good supplementary activity. Although they have been proved to be useful devices, but many steps are required to change them to a formal specification.

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Vitae

Mansoor Fahim was born in Iran in 1946. He received a Ph.D. in TEFL (Teaching English as a Foreign Language) from Islamic Azad University in Tehran, Iran in 1994, an M.A. in General Linguistics from Tehran University in Tehran, Iran in 1978, and a B.A. in English Translation from Allameh Tabataba'i University in Tehran, Iran in 1975.

As for his professional background, he was the chairman of the EFL department at Allameh Tabataba'i University from 2003 to 2007 and a member of the faculty of English Language and Literature at Allameh Tabataba'i University in Tehran, Iran from 1979 to 2008 when he was retired as an associate professor of TEFL. He has also taught English at a welter of universities and language schools. At present, he runs Psycholinguistics, Applied Linguistics, First and Second Language Acquisition, and Discourse Analysis courses at M.A. and Ph.D. levels at a number of universities in Iran, including Allameh Tabataba'i and Islamic Azad Universities.

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