

English Language Teaching with an Electronic Concept Mapping

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Abstract—Educational technologies have contributed greatly to the improvement of the process of education. Besides contributing to education directly, the development in new technologies made it almost compulsory to bring new approaches in teaching methods. Among these contributions can be mentioned the application of Internet Technologies in teaching. There is an ever-increasing positive impact on learning of combining technological materials with teaching methods, or using them as teaching materials. Electronic concept mapping can be considered as a teaching method to raise motivation and meaningfulness with its features being contextual, visual, multi-dimensional and interactive. Concept maps are of significant structure in language teaching because of their cognitive complexity, coherence and taxonomic organization. As concepts are contextual in English, this will create an appropriate atmosphere for it to be learnt together with its phonetic and linguistic structure. In this study a model of e-concept maps has been used as an alternative teaching method.

Index Terms— Concept maps, Educational technology, English language teaching,

I. INTRODUCTION

One of the favorite subjects in education is learning theories based on constructivist epistemology and the related instruction approaches developed on the basis of these theories. Some of the currently popular concepts are cognitive constructivism, social constructivism, situational and cooperative learning. The new ideas in this new learning concept are based on the method that information is formed by the learners, rather than being transferred by a teacher to the learners. The new values popularly accepted by a great many of the surroundings focus on the fact that learners should be active formers of information, not passive recipients. In this sense knowledge is constructed by an individual, rather than transmitted to the individual.

As information is based on the context [1] and is styled by individuals [2], the language becomes very important because it is used as a means in this process. Learning takes place around the context and in a social interaction. The basic issues of cognitive psychology could be the way information is processed in the brain, the way it is reached and the way it is kept in memory until it will be necessary. Learners will need to form a cognitive map in their memory to use as a reference in the information process. The more the maps in their memory increase in completely; the more learners will be able to engage in the most efficient of learning activities, in accordance with their potential [3, 4, 5]. The learners will prefer a

context-based method and an individualized creative style in this process.

One of the most preferred learning strategies is the concept map, which was developed on the basis of David Ausubel's constructivist theory of meaning by Novak (1984), inspired from Piagetian learning theory [3]. The main idea of the concept mapping is that learners will learn something in the present basic structures by adapting and assimilating new concepts and relations. Therefore, concept mapping is a strategy and method to support learners to learn by them. The meanings are subjective and the control of a person's meanings of life must be given to him/herself.

Concept mapping is active and also helps learners to learn meaningfully. This is because in meaningful learning, learners integrate what they have already learnt with what they are learning at that moment. With rote learning, learners do not need to connect what they are learning with what they already know. Concept mapping is the learning or teaching strategy to show how learners learn something and how they give meaning to it. Meaningful learning, which is defined as forming information, between concepts in a way to associate the concepts and statements one owns with the new information, will only be possible when a relation between concepts is formed [6].

The discussion of the mind process and the new approaches in learning has brought new dimensions to the use of technology in the field of education. The current studies support constructivist education with the use of hypermedia, concept maps, simulations, the Internet, web support [7, 8, 9, 10, 11, and 12]. On the other hand, the new developments such as anchored instruction, cooperative learning, and situated learning can be made easier by using digital videos. The use of digital videos will be efficient to reflect the relationship between distance regarding time and moving objects regarding speed, and graphic presentation. The use of different materials such as texts, dialogues and videos will be combined to form complicated knowledge structures in language learning especially to learn or broaden vocabulary as they will provide different learning activities besides other applications in language learning.

Concept maps are used in educational sciences, psychology and philosophy of science to present a visual language in knowledge and discussion forms. They will complete the natural language as a method of communication. Rather than an objectivist epistemology, they will display a constructivist epistemological approach based on students forming the knowledge themselves.

A concept map is a heuristic device. It facilitates students to understand the structure of knowledge and process of knowledge construction. Since a concept map is based on generally paper-pencil work, it does not provide a rich media of necessary picture, graphic, animation, etc. to students. Teachers present examples of such concept maps readily. Students also construct them as paper-pencil work or word processing programs on the computer. However, electronic and digital technologies supply a rich learning multimedia to users. Additionally, they give opportunity to combine and organize various multimedia such as texts, audios, videos, and animation. Therefore, in this study we have developed an e-concept map for students to learn English. One of the main issues for language learners is to keep the necessary vocabulary in mind for learning and talking. By means of concept maps pupils will be able to keep the concepts in mind because they will see, read, write and change them. As they give the students a chance to see the concepts interrelated to each other, they are much easier to remember. E-concept maps will most probably be like a game on the computer, which appeals to young learners much more than other sources.

II. CONCEPT MAPPING

Since concept maps have been developed and used in the field of education, a great many studies have been carried out on them. Concept maps have long been used as a model or strategy in various fields of learning or instruction. They can also be used in the way they are prepared by students themselves in the form of a digital electronic page or a traditional sheet of paper in order to present information to learners or to form their own meaning.

Concept maps, concept mapping, graphic organizer, mind maps, casual interaction maps are different terms or phrases used in different studies [5, 13, 14]. Although the terms were developed from concept maps, they have some structural or practical differences in meanings given by different scientists.

Concept mapping is an alternative form of presentation based on hierarchical structure between concepts. According to Novak and Gowin (1984, 15) "concept maps are intended to represent meaningful relations between concepts in the form of propositions. Propositions are two or more concept labels linked by words in a semantic unit". However, for concept mapping they say (1984, 17) "concept mapping is a technique for externalizing concepts and propositions". In this context concept mapping can be creative activity and may help to foster creativity.

Because of the hierarchical relationship present between concepts, concept maps are different from flow diagrams and concept nets [15]. Although visual elements like schemata, diagrams and charts are used in education, the main difference lies in the nature of concept maps which were developed on the basis of the mental process to form the content and to structure it.

Concept maps are used to give information to learners, and for activities to enrich the contents of concept maps, and to evaluate the students' learning [14, 16, and 17]. In other words, they are used as a means of evaluation. Lapp, Flood & Hoffman (2004; 299) state that students

and teachers use them in many different forms. One example might be that learners can work collaboratively to prepare a concept map, have a discussion on a subject and present it. This cooperation is quite important for language learning and it is key to social constructivism. For example a concept map can be used to teach, or of course to learn, some basic concepts of administration such as legislation, execution, judgment, law, etc. These terms are all used very widely in the related field and they are related with each other. The concepts will get deeper in the course of time and become more meaningful. Those concepts that a learner learns later will enrich the diversity of the map but the concepts will be kept integrated. By means of the integration they formed in a single group of concepts, the learner will learn about the relationship between concepts and how they form a unity when they come together.

Concept maps can also be thought as a system in the form of a graphic or image to organize a main idea and its details. The content of those prepared by learners themselves will provide a picture, a figure, a diagram, a scheme and an associated link based on the related content.

Concept maps can be prepared in various forms and structures. Parallel to new developments in information technologies, it is possible to see interactively created programs, interactive CDs, web-supported and web-based examples. SmartDraw and Inspiration Software Inc. (www.inspiration.com) are good examples of these. An example of the concept map developed by Novak & Gowin (1984: 16), found at this website, has been revised and presented here in Figure 1.

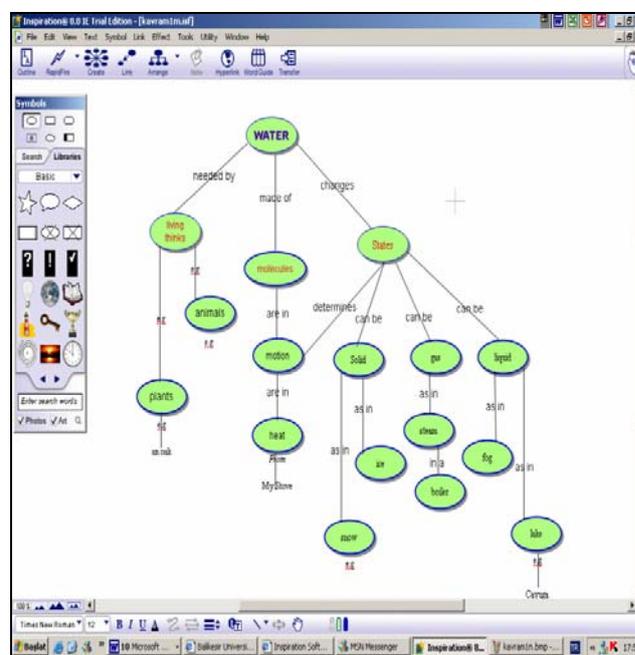


Figure 1. The sample concept map developed by Novak & Gowin (1984: 16) using the Inspiration program

As can be seen in Figure 1, concept maps are mainly developed for learners to learn basic concepts about a subject. They are also used as learning and teaching strategy and can be adapted to every kind of field at every grade and level. They are especially associated with the new approaches in the field of learning and instruction. There are a lot studies in which concept maps are found efficient [18]. It is often stated in the studies that concept maps help learners to learn meaningfully, to integrate their knowledge and remember it whenever needed. They are also found to improve learners' performance to fulfill their tasks [19]. Various studies undertaken by researchers, i.e. Horton, McConney, Gallo, Woods, Senn, & Hamelin, (1993), Trowbridge and Wandersee (1994), Çelikten (2002), Duru & Gürdal (2002), Ayas, Karamustafaoglu, & Coştu, (2002) and Doğru (2002), have shown that concept maps have a positive impact on students' achievement when used in education.

III. E-CONCEPT MAPS AND LANGUAGE TEACHING

The importance of the e-concept maps for language teaching is that they have concrete graphics where a single concept is linked with other related concepts in the same category. In other words, concept maps are two-dimensional concrete schemes to show the relationship between the concepts in a subgroup with a wider one, which makes them more significant in language teaching. Language, in a sense, is a daily life activity. The terms or phrases we use in our daily life are of course contextual and they should therefore be taught in an appropriate context so that they could be used by learners in the right place and situation.

A concept consisting of a word and words related with it will prevent cognitive confusion among the students of language classes as some concepts are presented and exemplified in entirety. Concept maps could, on the other hand, help foreign language instructors to develop a general language technology supported by interactive ones. Not only can the maps be used as separate documents but they can also be placed as interactive pictures within moving documents. It is possible to link a concept map with another. Retrieving, playing sound and broadcasting multimedia object is under the user's control. Technology can be designed in local or wide area links to make it accessible to one or more users simultaneously. With the help of electronic concept maps, texts to be used for teaching or learning could be richer and more dynamic, and provide the context needed for better learning [16, 26, 27, and 28].

The way E-concept maps can be used is that:

- ✓ Learners can develop their own concept maps,
- ✓ Instructors can give ready-made concept maps to teach the vocabulary needed,
- ✓ The instructor gives the main concept and the students prepare the map,
- ✓ Learners prepare the map in cooperation/ collaboratively,
- ✓ Learners form the link and understand the relationship between the main concept and the related concepts.

An e-concept map is a tool that is designed for individual learning and for groups guided by teachers in

classes where web-based and computerized education and the Internet is available. It will help teachers in their task to teach their students how to keep in mind new concepts in the context, together with the similar or related ones. Furthermore, the concepts the students have learnt will enrich the vocabulary necessary for students to master the language they want to learn. By means of concept maps the students will not only understand the concepts but also they will be able to use them whenever they need.

Teacher records one of the concepts s/he wants to teach on the tool. Students find the concepts related with the one in the middle. When students themselves find the concepts related it would most probably be difficult for them to forget them.

Concept maps can also be prepared on the web. Before a text is given, the teacher can give the students some of the concepts to be presented in the text and the students can find the necessary concepts related. When a teacher has the chance to contact his/her students to check what they have found, s/he will be able to direct the students to find the right concepts. By means of the sentences the students will construct in the tree, they will learn to use the concepts and understand the relation between the concepts. In the following class they will learn how the concepts are used in the context. This is also a chance for a teacher to get feedback for his activity.

An e-concept map will create a learning atmosphere for a number of activities in foreign language classes such as teaching general or technical nouns, adjectives, adverbs, phrasal verbs, etc. It will facilitate contextual comprehension, which one of the most important objectives in language teaching.

An e-concept map can also be designed after reading a text. This is a better way for students because they will have a sample in the text and create the map in an easier way. Otherwise, the students will have to consult a monolingual dictionary or search a lot of texts to find the necessary materials. They will find an opportunity to compare the e-concept maps they have designed before and after the course.

When an e-concept map is completed, each student records it in his/her computer. At the end of the semester s/he will hand it in to the teacher to be accumulated into a file. The teacher will later deliver the file to the students in order to study in the future. This has a number of advantages. For instance, the students will find several maps for the same concept. By using e-concept maps the students will learn to use words in sentences. They will learn to pronounce them.

The students have another advantage. They can share their maps beforehand, which will help the possibility of interaction in the classroom. Sharing will require communication among classmates, which is also the main task of education. The communication from and to the teacher and the one among students will create a better environment for effective learning.

As different student probably from different levels will prepare an e-concept map, they will be able to compare themselves with other students in the same class. This is a good way to see the improvement of students. A teacher can also see the differences and similarities among the students, which is called peer assessment in the field of education.

An e-concept map can be designed without a text. Some teachers of a foreign language sometimes give their students some concepts and want them to make a composition using the concepts given to write about a specific topic. By means of e-concept maps the students will be able to use their computers to do their homework.

Using e-concept maps is different from online dictionaries. A person will use an online dictionary to find the meaning of a word s/he does not know. Online dictionaries are popular nowadays among people but their aim is different. They give people to find the meaning of a word or phrase on the computer or the Internet. So they are of course so helpful for everybody. However people may forget most of words or phrases they have checked later on.

E-concept maps are different. They are designed especially for students and students themselves prepare many parts of the maps. Thanks to the experience they have to prepare parts of the maps, they will much easily remember the content of the maps and they will keep them in mind for a quite longer time.

In English Language Teaching (ELT) they can be used:

- ✓ To learn a word and those related with it
- ✓ To learn how words are used
- ✓ To learn how to spell and read words
- ✓ To comprehend a text easily
- ✓ To learn grammatical structure of words.

In ELT what instructors do is mainly to give grammatical structures and to give as much vocabulary as possible that learners will need to express their feelings, ideas and needs etc. by means of them. Sentences are formed of smaller elements that we call words, and the words are in two groups, content words and function words. Learners are given content words in structures with their synonyms and antonyms. The function words, however, are given in grammatical structures where they are usually the only alternative to be used there. Learners are also given opportunity to develop reading and writing skills.

Figure 2 and 3 are concept maps developed by the researcher totally for an electronic setting to teach or learn a foreign language. They are prepared to serve on the web for language teaching. Concept maps are used both for studying with texts, recording voices and listening to them.

E-concept maps are also used for formative assessment as it is possible to observe how learners improve themselves in aspects such as increasing their vocabulary, reading comprehension and pronunciation etc. by means of the one kept by instructors. As a result, the instructor could give his students the feedback necessary to address problem areas, and would have a better opportunity to observe regularly and continually the progress the students show.

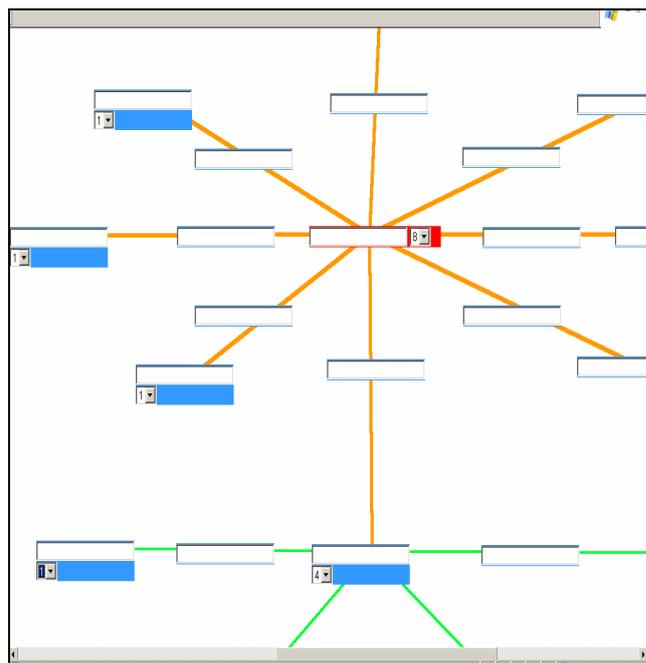


Figure 2. E-Concept Mapping

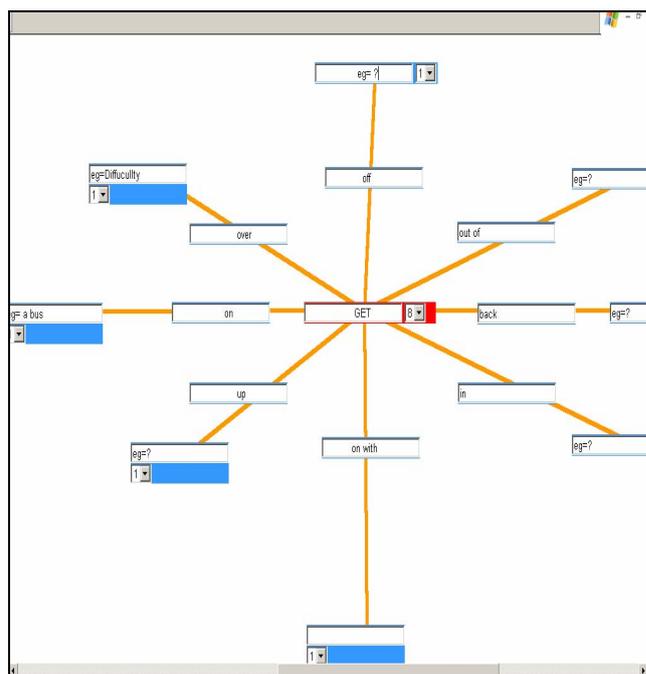


Figure 3. A sample of concept map with the verb "get"

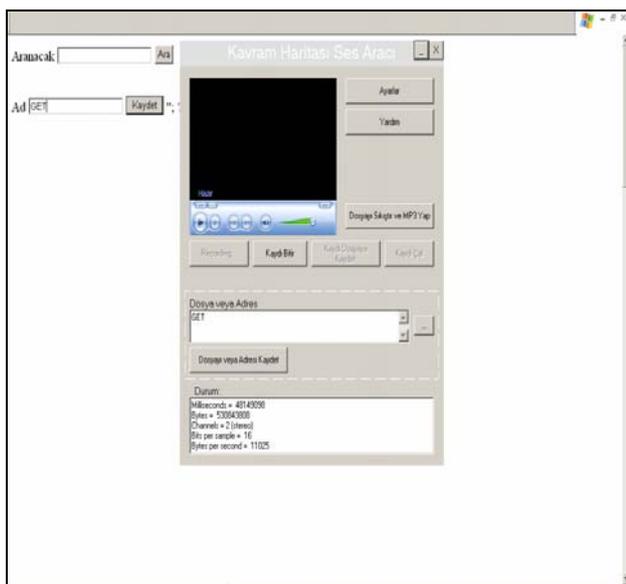


Figure 4. Pronunciation study

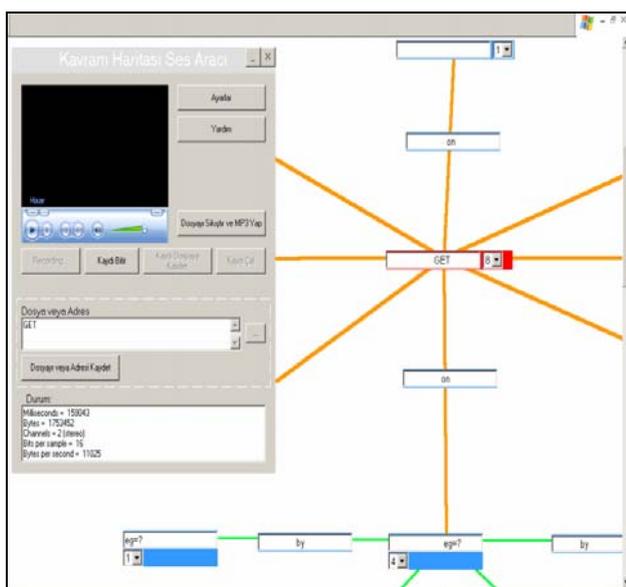


Figure 5. A concept map for reading and listening to what they have written

As can be seen in the figures above, the instructor gives a main word and all the related phrases to the learners and writes the prepositions, suffixes and other related words/terms. Later s/he records it to his computer or to the server. He can also give the pronunciation of the words or phrases in the figures.

The learner can see a word and the necessary grammar structures as in Figure 4. The learner can use a complete concept map in which everything about a word or phrase is used together in entirety as well as one in which only the main word or phrase is given to learners to complete the missing lines by themselves following all the instructions. A learner can himself prepare a concept map after reading a text, using a concept in the text as a main

word and using endless branches to broaden the figure. E-concept maps make students' manipulation possible. As concept maps are interactive, learners can form their maps in accordance with the depth they have achieved in learning. They can be constantly improved and they are quite flexible.

Speaking is also an important factor in learning English as well as other factors, and students can utter and record whatever words they wish, and have the chance to re-listen to them later. In this sense, by using concept maps it is possible;

- ✓ To present words and their relevant words and meanings;
- ✓ To enlarge the vocabulary capacity and reinforce their use in relevant contexts;
- ✓ To learn the correct spelling and pronunciation of words;
- ✓ To present the grammatical structures of words and, when necessary, allow students to form them;
- ✓ To provide cases in which the students can see word forms and synonyms together;
- ✓ To restructure the framework of a text electronically, based on a comprehension task of this text;
- ✓ To provide visual elements such as pictures, figures, and graphics within the concept map with an enriched text; and,
- ✓ To learn English in interactive settings.

Use of different types of presentations such as texts, speech acts and video; and, presenting the field knowledge through different activities by which to learn English words contributes to the formation of the complex information structures. When this aspect of technology is combined with concept maps, it would make contributions in establishing electronic learning setting in the classroom. A concept is the order (regularity) in the voluntary events. For instance, rain is a label used for the fall of drops from clouds. Propositions are related words forming the semantic unit, which shows a particular order [4]. E-concept maps are visual references/representation. They allow us to recognize the relationship between the contextual elements and support the acquisition of an informative view. Thanks to this technique, students grasp certain concepts and the meaningful relationships of these and their concepts. When looked at from this point, this provides a complementary view about of a certain concept. This is a view supported by the Gestalt Theory and it's the claim that the whole means more than the pieces that compose that whole.

The concept map is an important tool for supporting the activities based on a text in reading and understanding this text since it forms a complete activity in terms of English teaching, reading, writing, comprehension, speaking, and grammar. The e-concept map gives every student the chance to prepare their own concept map following the main ideas, judgments, and cases included in the text. This also gives students the possibility of recording their concept maps to the version provided by the teacher/central version or their own computers.

IV. CONCLUSION

Using concept maps is a very important teaching strategy used in both presenting information by teachers and students' management and evaluation of their own learning. However the studies and activities based on concept maps are particularly used in the visual presentations of the required data of contextual areas, they have the potential to be used for several learning and other purposes.

Considering, in particular, the elastic characteristics of concept maps and their positive effects on learning it can be possible to develop and extent their use for several computer, internet and learning areas. In addition, it would be useful to develop concept maps for the fields related to students and create multimedia settings to achieve this aim. It is necessary to use concept maps, providing certain information categories, in a way that would help interactivity among students and that would allow their manipulations. Learning tasks should be challenging, authentic, and meaningful. In this respect, the technological potential supporting some particular learning goals should be considered. Multimedia-based web can present the extra sources, graphics, concept maps and audio documentaries.

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