

APPLICATION OF MIND MAPS IN EDUCATION

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Review paper

Abstract

This paper discusses the use of mind maps with an emphasis on using in the field of education and pedagogical sciences. Obviously, mind mapping can become a powerful tool for understanding many pedagogical phenomena, especially when transferring knowledge. For these reasons, they are based on the possible foundations and the basis in the physiological processes of thinking and memory. There are also sources that can greatly help understanding this problem as well as applying it to everyday activities in all spheres of life and especially in education. It is possible to compare with similar models of thinking and learning with which these ideas undoubtedly share a large part of the common space. All interested parties are invited to continue their research, including experimental research to determine the current domains, especially in the light of new educational strategies.

Key words: mind maps, education, learning, pedagogy, creativity

Introduction

In order to have a debate like this, there are three, at first glance, simple issues, but those who are looking for relatively complicated answers. Of course, when science is concerned, questions have no end, but the following three are important for this work: What is the pedagogical space? What is a mental map? Why is it important to apply mental maps in such a space? To begin with, it can be argued with certainty that problems, as well as solutions to these problems, come from the pedagogical space, as they define it, depending on the aspect of looking at society as a living entity and for the individuals who make it. What does that mean? The meaning derives directly from the definition of society itself. The concept of society is explained in many ways by different theoreticians of society so that there are several definitions but common parameters are relatively easy to distinguish: society is an abstract whole of relationships between individuals or a system of relationships that are interdependent parts that is capable of their own reproduction. It is adapted to the environment (production activity), it is integrated (it has a normative order). It also has a hierarchy of goals and ways to realize and maintain a certain dominant cultural form of value through which social life is taking place, as the interplay of culture, the person and the social order (Fanuko et al., 1995). Simply put, according to the theoretical theory of Talcot Parson, society is a system of interconnected parts, each part having its own function, which must be performed in order for the whole to function, and each part is in relation to the others to which it affects it (Haralambas and Heald, 2007). The key word in the foregoing text is playback. It has already been said that society is a living entity and life is reproduced. How did society ensure its reproduction? By providing an adequate part of it, connected to the others with whom it is a whole, whose function is precisely the

transfer of everything that one society does different from the others, to the young and the new generation, primarily through education and then socialization and other processes that are held and shape the society. The segment of a society that performs this function is called a pedagogical space, the scientific discipline within that area that deals with the processes of education and / or the transfer of value is called pedagogy and all those who deal with the transfer of these values in any way are called pedagogues. This transfer is achieved by teaching (from the position of the teacher) or by learning (from the position of the one being taught, e.g. the student). It can be taught in different ways and yet it can not be anyone, the one who does this works in a certain way and does not have to respond to others. Likewise, it can be learned in different ways but unfortunately by a system that has a systematic teaching method and the mourning of the individual itself, how much information will depend on both the teacher and the student. Of course, there are different experts and different fields, but whatever they are studying must result in knowledge as a final result. And with the knowledge it needs to make society even though its goal is to progress, at least stagnate. Therefore can be seen the obvious reason why the pedagogical space is so important. Equally obvious is the essential segments of the learning process (teacher, content, student) but one of the most important learning processes is the integration of knowledge. Incorrect, clumsy or incorrectly sending a lot of information from a teacher may or may not result in a student's knowledge. Likewise, ignorance, inability, disrespect, and neglect of students discouragement and correctly transmitted information to turn into knowledge. The idea is to get the information received into a larger picture - real knowledge and then linking different areas in one direction for the purpose of one goal.

There are a lot of ways and techniques, people are changing and choosing how to handle and time changes. One of these changes is the use of mental maps in teaching and / or learning, which is the result of the fact that information is organized in a simpler and more systematic way.

Problem and aim

The subject of this paper is that mind maps, although long existing in modern times as a very valuable pedagogical instrument, are functional but not used enough. The problem of this paper is the application of these mental maps in the pedagogical space in order to demonstrate their importance in the entire learning process and to find out how well mapping is essential for teaching of new generations and how much it facilitates adoption of new scientific areas.

Discussion

So, the answer to the question of what the pedagogical space lies in the definition of pedagogy as a scientific discipline and to it, by certain rules of the added space of action. Pedagogy is a science that studies educational and educational processes, that is, science that deals with research and analysis of the legitimacy of education. The main subject of pedagogy research is the educational process and its legality, and the following outcomes are as follows: a) studying and researching the phenomenon in the educational process b) developing and improving educational work c) scientific evaluation of achieved results, standardization and orientation according to the desirable Forms d) development and improvement of pedagogical methodology of research. According to Šimleša (1978), education is a general, permanent and important category of society that manifests itself in the transfer of social work experiences: achievements, knowledge, customs and the notions of the older to younger generations. By adopting the experience and knowledge of previous generations, the new generations continue to work, enrich and refine the material and spiritual culture of mankind, so education is actually the process of forming man as a human being with all his physical, intellectual, moral, aesthetic and working qualities. Pastuović (1999) considers that education is an organized (deliberate) learning of cognitive, psychomotor and motivational (volitional) personality traits. As is well-known, there are no cognitions (the share of cognitive processes), while cognition has no more explicit activation of cunning processes. That is why learning, especially organized (such as education and training), begins with the activation of cognitive processes and therefore they in the whole of education prevail over ceremonies. This means that in organized learning (education), as a whole, education prevails over upbringing. This is particularly pronounced when a teacher strives to raise with higher forms of learning: by learning through insight (not understanding), and not by classical and instrumental observation.

In this way, the constituent element of some values, attitudes or habits is based on an appropriate cognitive basis. Such education is specifically human because it is used in thought processes. This means that efforts are being made to educate (Bonacin, Da., 2010). Pastuovic (1999) also considers that the main difference between the notions of learning of that education and education is that learning can be spontaneous, e.g. unintentional (so-called natural learning), while education and training in a higher or lower degree is organized learning, and includes the feature of learning flair. Have the activity organized if it contains the following basic phases: preparation, performance and evaluation of the effects of the activity. Education and training is, therefore, prepared, methodically articulated and evaluated cognitive and affective learning. From such understanding of education begins the curriculum theory that deals with the development of curriculum techniques for preparing, conducting and evaluating the educational-educational process. According to Glasser (1994), successful teaching is probably the most difficult job in the world. Through this job, it is primarily managed by people (students), often under inadequate conditions (number of students, work materials, etc.) and inadequately paid time. In this context, the student is not treated as a creative person who has his / her own needs but only as a single person to be supplied with the most needed information. Glasser believes that the motivation of teachers and pupils, as well as the use of more modern teaching and aids techniques, has enabled creatures and others to improve the results of the teaching process. Muk (2009) believes that if creativity is to be developed, a lot of effort must be made to start working differently. This includes thinking outside the box, out of automatism, creating new and unknown thoughts, linking unrelated ideas and information. The basic prerequisite for creative work at school is the ability of her employees for creativity. Teachers play a big part in whether students develop or fend off their creative potentials. They need to become creators of the teaching process, and enable the children the environment in which they will feel safe, free and socially accepted where they will be creative. How does the human brain work (learn)? It would be simpler to say that it collects data through sensors (vision, hearing, flair, opus ...) processing them and giving them a meaningful meaning, rejecting them as irrelevant and essentially memorizing in memory. According to Gudjons (1994), Gagne (1969) speaks of 8 degrees of learning that are hierarchically upgraded to one another, and the rule that, in order to move to the next step, the previous level has to be adopted. From this, he made a sort of map / map of materials to be learned, in which the teacher would classify parts of the task in the form of a hierarchical series of so called "structured learning." This paper has played an important role in the development of the curriculum and as it is seen in the previous text, it is also a kind of mental map.

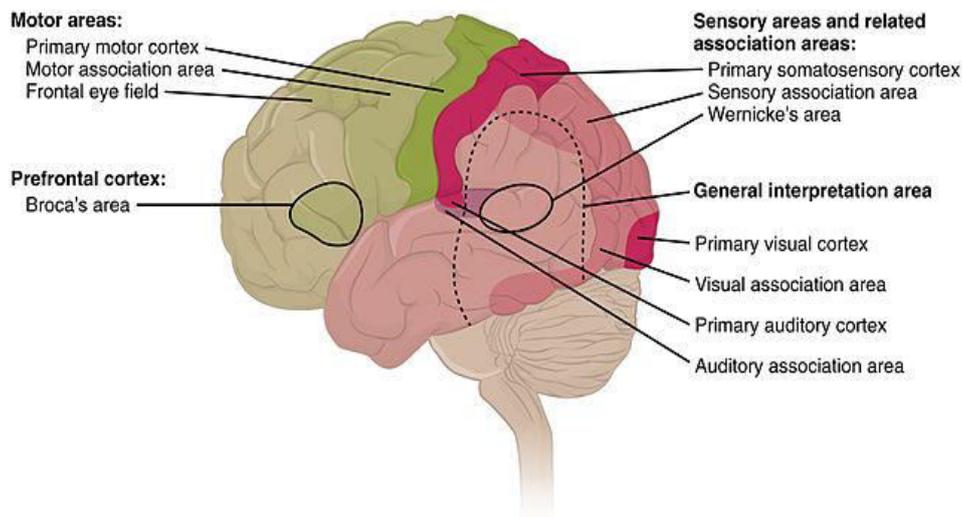


Figure 1. Brain functions.

[Source: https://en.wikipedia.org/wiki/Human_brain#/media/File:1640_Types_of_Cortical_Areas-2.jpg]

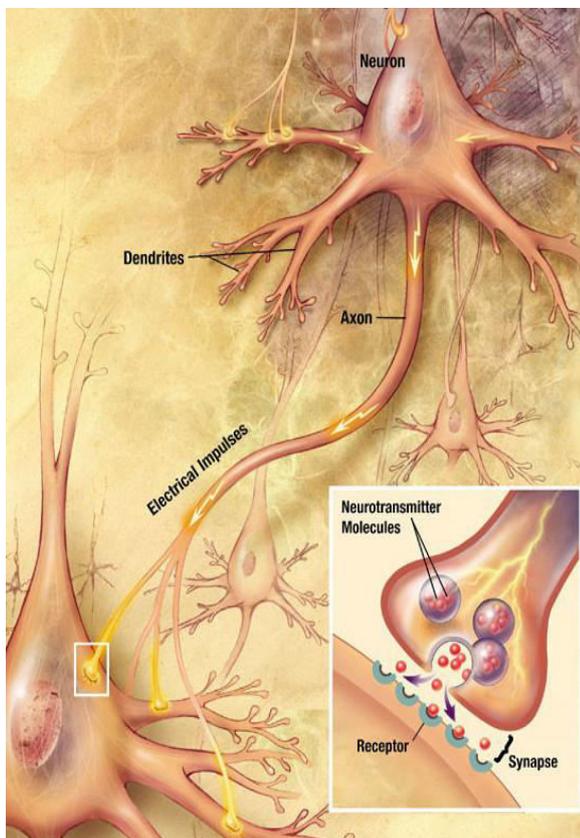


Figure 2. Neurons and synapses.

[Source: <https://en.wikipedia.org/wiki/Brain>]

On these grounds, there was a thought that the human brain processes information similar to the computer as can be seen from the following picture. Therefore, the input must be of high quality to activate the sensors and free the orientation reaction (computers should enter the data in any way). In order for short-term data to move into long-term memory, they have to be exposed to associations for a certain amount of time in order to keep the attention long enough (with the copier it means giving adequate command).

Furthermore, the meaning and meaning of the input material play a great part. Bruner 1974 (according to Gudjons, 1994), material from the environment can be presented at three levels: 1) acting presentation 2) pictorial representation 3) symbolic representation. The school decided to use the linguistic-symbolic level and the students quickly forgot. Individual parts should be linked by intermediary articles (mediators) that act as stimuli e.g. references to our interests. Also, according to Gudjons, 1994, Gage & Berliner (1986) have shown that logical editing or hierarchical organization significantly improves memory because the data inside the brain are like books in a library or files on a computer. It should not be forgotten the importance of the process of integrating new data into already existing ones and their adequate connection. As the new material fits in better with existing schemes, it will be easier to save and remember. Figure 4 shows different hierarchical levels of abstraction, the lowest level of concrete events. From the previous text it is possible to identify how the human brain works. For this reason, mind maps have so good results in the teaching process. Historically, people have used abstract maps in an abstract way since the very beginning of their existence, in the way they made important things on the walls of their caves. The manner and complexity of these maps / drawings were dependent on the development level they were on. The very beginnings of such an activity are seen from images drawn in prehistoric caves in France, Spain, Namibia, Tanzania, Algeria, Egypt, etc. Most of these images depict the lives of people of that age and things that are important to their survival and prevail over animal and human images. What reminds a mind map is a way of drawing that organized "story story" from beginning to end, usually from left to right like, for example, a hunt for an animal. On the other hand, it was that what the poster taught was important in the middle, and that essentially surrounded him from all sides. Similar work is found throughout human history.

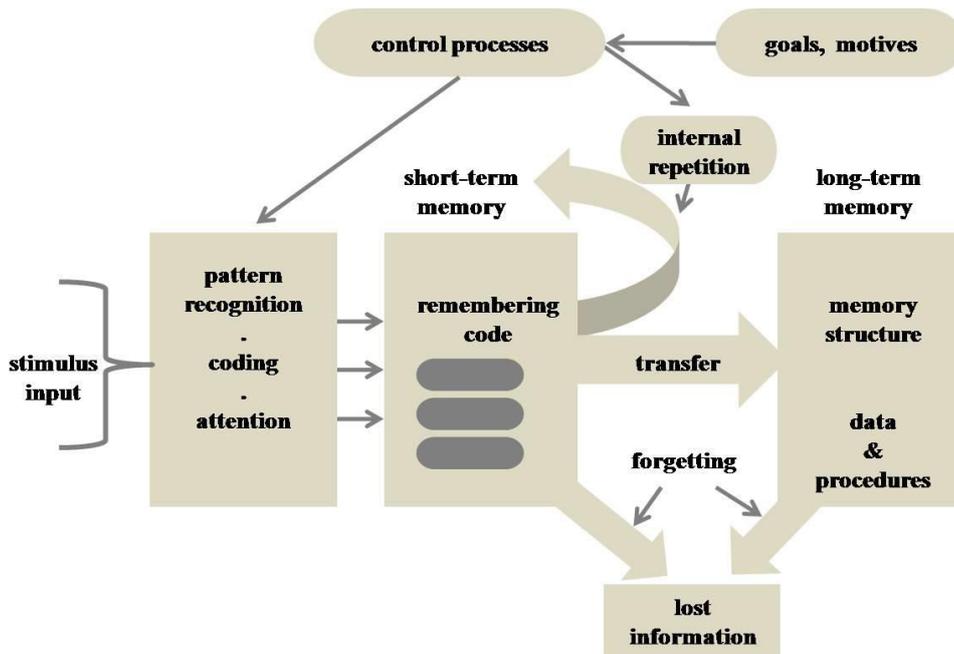


Figure 3. Processing information based on a computer model. [Source: Bower/Hilgard, 1984 according to Gudjons 1994]

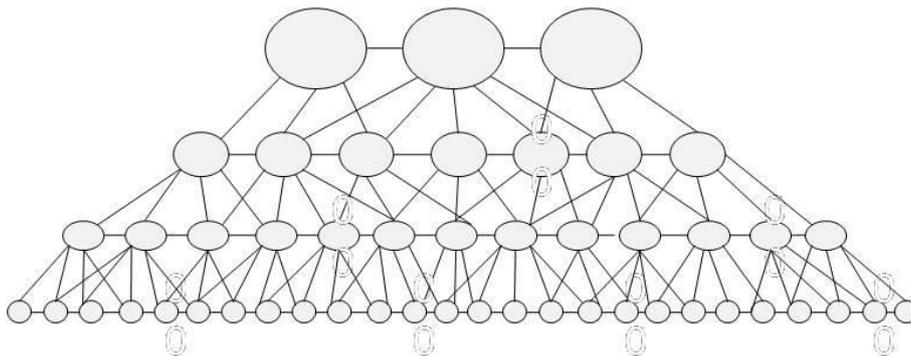


Figure 4. Hierarchical order of the structure of knowledge and values. [Source: Edelman, 1986 according to Gudjons 1994]

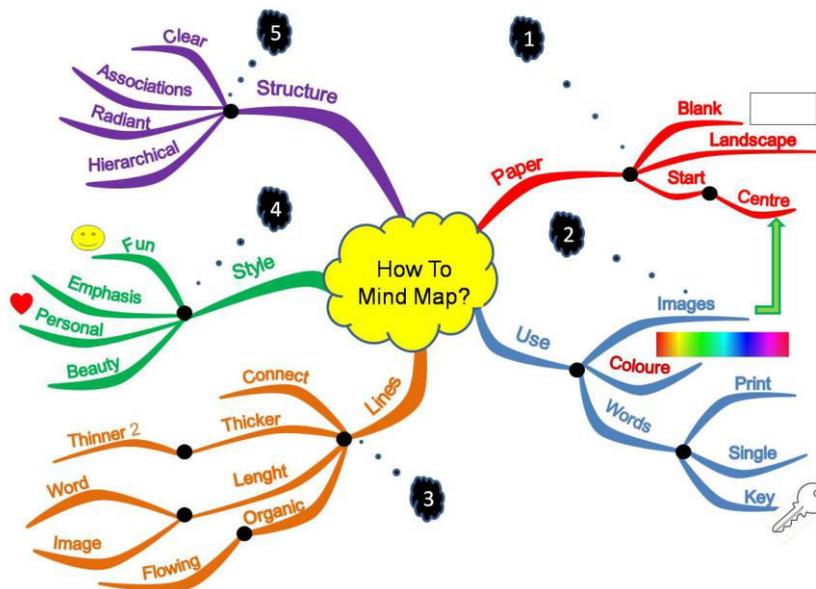


Figure 5. How to Mind map. [Source: From net 2017i, adapted by authors]

But what we can actually call a mind map is made in the third century. Porfirio of Tyros conceptualized the ideas of scientists like Aristotle. But mind mapping is generally related to well-known psychologist Tony Buzan who designed and mapped such mapping. / Mind Map® and Mind Maps® are the registered trademarks of The Buzan Organization. The Dark Map (From net, 2017n) is a type of diagram of a specific form that presents ideas (thinking) in a particular schematic fashion. As such, it contains words, sentences, symbolic pictures and drawings, and various other signs that represent the meaning of these ideas or thoughts. In the center, there is a key word or idea or theme, and around the other are imaginative ideas, all of which are connected both graphically and semantically and form a whole. Visually they can be separate or grouped, but the purpose of this structured presentation is to understand the memory and memory of the material and to organize a particular type of knowledge. The goal is to point out what is important: 1) Start at the center of a blank, landscape page, ideally with a colorful image to represent your subject. 2) Use words and pictures throughout your mp. Wherever possible use single KEY words, printed along a line. Each word or picture sits on its own line. 3) The lines make the associations between the ideas as clear as possible. Make them flowing and organic, each line the same length as the word or image. Always ensure that lines connect to the end of the line at the previous level. Typically lines will be thicker at the center and thinner further out. 4) Experiment with different ways of linking and emphasizing different aspects. Use highlighters, codes and arrows as needed. 5) The structure that should develop will be a "radiant hierarchy", with ideas radiating out of your central theme and main

branches (From net, 2017j). According to Fajs and Jerković (2014), the map first resided in teaching natural lessons, and then began to be used in teaching subjects where the logical structures prevail, and where learning is based on intellectual abilities, especially on the legality of thinking (From net, 2017h). In this area applied, the thought map functions as filled and incomplete (From net, 2017i; 2017j). It can be used to process new material, repeat and exercise, and is especially effective in synthesizing newly adopted teaching contents. Some of the authors' teams in language sets for the classroom teaching of the Croatian language have provided orthographic and grammatical mental maps. Making it easy is to follow the tips of Buzan (2004). According to the same authors, by creating and using a mental folder the necessary amount of livelihoods in language teaching is introduced, it is easier to motivate students to adopt orthographic and grammatical facts. Bežen (2008), based on good practice, considers the map of thought to be part of a complex "methodical instrumentation" if its functionality in teaching is completely clear to the teacher responsible for the student's literacy. Vrsaljko & Ivon (2009) think that given that the teaching process implies creativity at all stages, it should be emphasized that the only creative teacher can stimulate creativity in the student, and therefore have to re-examine the tasks he wants to achieve through his educational approach, methods of work and resources and aids Which is used in teaching (Buzan, 2001). As the new curriculum reform requires greater involvement of students in the creation of teaching units, and thus greater creativity, they are increasingly insisting on problematic, project and research teaching, collaborative forms of learning, work in groups and work in pairs.

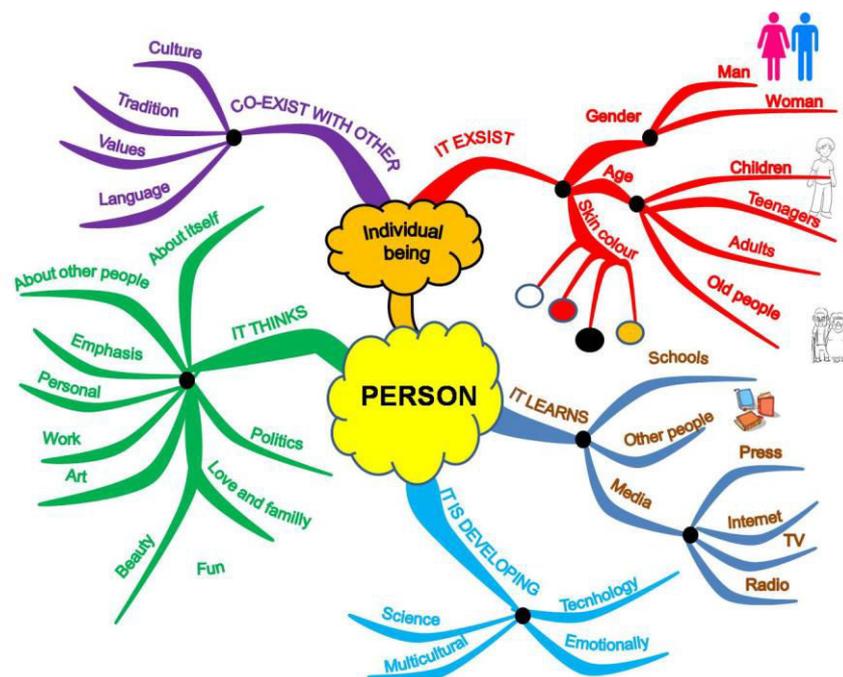


Figure 6. How to Mind map.

[Source: A person as an individual being (based on Bonacin, Da. 2010)]

They note that the method of creating mental maps particularly encourages students' creativity, and is also a generally accepted method of teaching teachers (Zempetakis et al., 2007; From Net, 2017b; 2017c; 2017d; 2017e; 2017f; 2017g). The full map can be used in all teaching models but at all stages of the lesson, which underscores the fact that there are no set patterns in the curriculum (Mento et al., 1999, Rae, 2003). Using a mind map enables planning to write a composition, do school work, to deal with language and other terms (Fourie, 2011). Furthermore, the same authors consider the need to differentiate creativity of adults and children because children have less information, experience, concentration and their work styles are less developed. However, what they lack can compensate for their unique ways of thinking and approaching tasks, and their great advantage over adults is their imagination and imagination that must be constantly stimulated. In this paper, practical knowledge of the creation of mental maps is also applied. A map of man as an individual with all its attributes was made (Bonacin, Da. & Bonacin, d., 2010; Bonacin, Da. 2010).

Conclusion

Considering the fact that the experts theoreticians cite, and Tony Buzan practically proves, the application of mental maps is an excellent way to synthesize the material, whatever it may be, into which space it is, to its very essence (Weston et al., 2004, Senior et al. 2007; Sussland, 2007).

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And it's a "skeleton" who keeps information in an organized and meaningful way, and then the human brain is equally organized and repulsive. Applying such a tool in practically the most important area of human life is an extraordinary idea. Children (and adults) are open to new things, especially if presented beautifully and interestingly. However, not all present educators are familiar with the advantages of this learning method, so it would be good to first learn the educators first and then let them learn the new generation. Anyway, the future will show or already show that the use of mental maps, quite justified, takes more and more space.

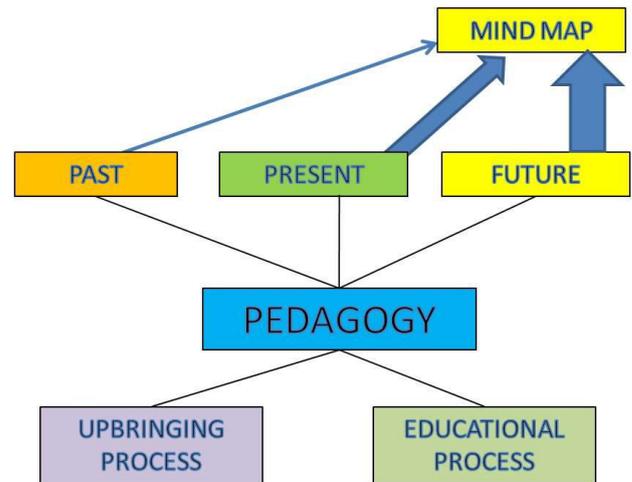


Figure 7. Position of Mind map in structure of Pedagogy.

[Source: based on Bonacin, Da. 2010]

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PRIMJENA UMNIH MAPA U EDUKACIJI

Sažetak

Ovaj rad raspravlja o uporabi umnih mapa s naglaskom na korištenje u području obrazovanja i pedagoških znanosti. Očigledno, mapiranje uma može postati moćan alat za razumijevanje mnogih pedagoških pojava, osobito kada se prenosi znanje. Iz tih razloga temelje se na mogućim osnovama i temeljima u fiziološkim procesima razmišljanja i pamćenja. Postoje i izvori koji mogu uvelike pomoći u razumijevanju tog problema, kao i za primjenu u svakodnevnim aktivnostima u svim sferama života, a posebno u obrazovanju. Moguće ih je usporediti sa sličnim modelima promišljanja i učenja s kojim ove ideje nedvojbeno dijele velik dio zajedničkog prostora. Pozivaju se sve zainteresirane strane da nastave istraživanja, uključivo eksperimentalna kako bi se utvrdila aktualna područja, posebice u svjetlu novih obrazovnih strategija.

Ključne riječi: umne mape, edukacija, učenje, pedagogija, kreativnost

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