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## Methodical aspects regarding the use of disciplinary maps in Biology, in order to improve the school children’s knowledge

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### Abstract

Within the lessons of biology, various types of graphical organizers for the structured presentation of information, as well as various techniques of graphic organization, can be used for the graphical representation of an informative content. One of these techniques is the disciplinary map, which help school children to make correlations between the knowledges acquired at Biology, and those acquired at other disciplines or by individual study. In this paper we present the mode in which this technique can be applied individually or in groups, within some biology lessons, or as homework. Also, we give examples of filling out some disciplinary maps when studying themes such as “Medicinal plants” (5th grade), “The forest” (8th grade), “The Danube and Danube Delta” (8th grade), and “Vitamins” (11th grade).

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**Keywords:** general culture; biological concepts; didactical activity; activity of lesson’s projecting; selective disciplinary map.

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### 1. Paper rationale

General culture is a “synthesis of ideas and knowledge from the main fields of human knowledge, constituted as a system which can be easily used”. It is “the fundamental culture necessary to each human”, being considered “a common spiritual bridge which make people understand each other, regardless of their profession”. General culture represent “the main way for the multilateral development of child and young person”, being meant to give to the individual the chance of a quick adaptation to most variate conditions and integration into society” (Dictionary of Pedagogy, 1979, p.106).

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School culture, as a component of general culture, is in accordance with the educational ideal and specific tasks which education has to fulfill. It forms during all school period by studying various compulsory subject matters included in core curriculum.

At present, by the new content of the biological education, elaborated in accordance with the general competences of teaching-learning Biology in school, it is aiming also at formation of a general culture in the field of biology, necessary to the school children for their optimal integration in the active life (professional, social, familial) postschool (MECI, 2009, p.3).

Together with systematical studying of Biology as school matter, in the gymnasium education begin to form at school children the scientific concepts specific to this subject matter. The empirical concepts (notions) about plants, animals and humans, formed to the school children before entering school, in the most diverse situations and occasions, with the help of adults, and during the primary education, „does not disappear concurrently with studying Biology, but they are restructured, reconsidered, improved, enriched and transformed in scientific concepts” (Petruța, 2009, p.193).

The teacher’s knowledge on all types of concepts which follows to be formed to the school children within a lesson (concrete concepts/abstract concepts; great generality concepts/limited generality concepts, etc), of relations which can be established between them, as well between these and the concepts acquired previously by the school children, allows to select and apply the most adequate methods and didactical procedures in order to form and develop biological concepts (Petruța, 2009, p.88).

Besides didactical methods which are used routinely within the biology lessons, in order to ensure direct knowledge by the school children of organisms, biological processes and phenomena, the teacher can apply various types of graphical organizers, as well as various techniques for graphical representation of the informative contents.

One of these techniques is the disciplinary map, which can help the school children to make correlations between knowledges learned at Biology and those learned at other school subject matters.

The use of „selective disciplinary map” within the lesson of transmitting/acquiring new knowledge, in the stage of transmitting knowledges or their fixation, and subsequently realization by the school children of a portfolio piece based on it, as homework, would represent a novelty element, attractive and interesting for the school children. This can be applied in the activity of teaching-learning-evaluation carried out at biology and can contribute to the systematization of school children’s knowledges, and also to their enrichment.

## 2. Paper theoretical foundation and related literature

The disciplinary map is similar, as graphical representation of an informational content, with the conceptual map or the cognitive map.

The term of “conceptual map” belongs to American professor Novak and his research team, who were involved in the research program carried out at Cornell University, in 1972. (Novak and Musonda, 1991; Novak and Cañas, 2008, p.3). As emphasized by Novak and Cañas (2008), the new tool named “concept map” was “born out of the necessity to find a better way to represent children’s conceptual understanding” and emerged from “the idea of representing children’s knowledge” (Novak and Cañas, 2008, p.3).

Defined by Novak and Cañas (2008) as being a graphical tool “for organizing and representing knowledge”, the concept map “include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts”. The above mentioned authors mentioned that “words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts” (Novak and Cañas, 2008, p.1).

In the upper part of a conceptual map are written the general concepts, and the less general concepts are placed, hierarchically, in the lower part of it. “A concept map organizes information into clusters based on the strength of their association, thus being realized “a navigable hierarchy for both the maker and viewer of the concept map” (<https://www.msu.edu/~luckie/ctoolsbasic/ctoolshelp.html>).

With the help of cross-links, which can be included by the conceptual map, are pointed out “the relationships or links between concepts in different segments or domains of knowledge of the concept map”. Thus, “cross-links help us see how a concept in one domain of knowledge represented on the map is related to a concept in another domain shown on the map” (Novak and Cañas, 2008, p.2).

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