

**ASPECTS REGARDING THE MODERNIZATION OF THE
DIDACTIC TECHNOLOGY AND STRATEGY IN THE UPPER
EDUCATIONAL SYSTEM, A SUPPORT IN THE STUDENTS'
INITIAL TRAINING AS FUTURE GEOGRAPHY TEACHERS**

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Abstract. The present paper aims at defining the concept of modernization of the didactic technology and strategy precising the sense of the two notions, respectively didactic technology and learning technical means. There are exemplified certain models of upper education didactic strategies used in the teaching-learning process with direct reference to Geography. Their purpose is the development of the cognitive interests, of knowledge accessibility, as well as to make the students sensitive, aware, and able to apply them during their pedagogical training and in their future activity in the educational field.

Key words: technical means, models of didactic strategies, didactic portfolio, didactic technology.

• *The concept of modernization of the didactic technology and strategies*

Generally, *didactic modernization* supposes the selection, up-dating, and creative utilization of the *resources*, *contents*, and *didactic strategies* according to the demands of the present and future objectives of the educational system, demands resulted from its each segment.

In a pedagogical language, the concept of didactic technology denominates the steps achieved by a teacher in order to apply the learning principles in a practical instructional situation using the technical-material resources for transmitting the information closely related to the chosen methods, procedures, and organization forms.

The evolution of didactic-material resources reflects the penetration of the science and technique development level in the field, starting from the natural objectives initially used and ending with the present audio-visual means and multimedia systems.

Concretely, analytically, didactic technology comprises proper learning didactic means, which are useful for the effective teaching – learning – evaluation process, as they carry information, messages used as auxiliaries of the methods. For example, the disk, the compact-disk, the film, the program, the folder, the foil etc.

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The learning technical means belong to technique and comprise the devices that deal with information: video players, projector, TV set, computer, simulator etc. They represent a component part of the didactic strategy and then, they belong to the didactic technology.

Their functionality is independent and together with the other learning means developed before they serve the instructional process, hold a formative value, represent a component of the didactic strategy and, thus, belong to didactic technology.

• ***Models of didactic strategies used in teaching-learning process of geographical contents in upper education***

During the upper education, as a component of the system, there are followed the fundamental curricula documents that aims at the organization and functioning of the educational process, which is the study plan, analytical program or the projection of the activity through an adequate relationship between the *goals* and followed *objectives*, *contents*, *achievement conditions*, *applied strategies*, *evaluation*.

Consequently, we shall render some models of application of the didactic strategies based on the choice of an optimum group of methods, means, organization forms that deals with the learning contents. The organization forms of the instruction and research process are quite diverse:

- *frontal activities with large effectives* in the classrooms on different subjects;
- *activities on groups* for seminars, debates;
- *small groups* for practical training;
- *individual forms* for research, simulation activities, for consultations, projects elaboration, preparation of communications, independent research etc;
- *scientific groups, visits, and field practical training*.

Among the different types of strategies, we chose the *expositive-heuristic type* with the variant *utilization of technical-video means* that ensures the *projection of the didactic materials* selected by the teacher according to the structured geographical content grouped on subjects.

The expositive sense of these strategies emphasize that some pieces of information are related by the *teacher* during the lectures while the *heuristic sense* expresses the necessity that the teacher direct the *students*, through situations specially created for them to discover and know the scientific truth. It is well known that “*heuristics does not offer the recipe for covering all the way towards discovery, but it looks for new ways within the labyrinth of creation for its understanding*” (I. Nicola, p. 376).

For example, at the subject *Environment Geography* with the theme “*The ecosystem – a fundamental unit of the terrestrial geosystem*”, the teacher organizes the projection and the sustenance of the respective content using the video-projector or the projector by means of which there are projected illustrations or logical schemes regarding the two types of ecosystems (aquatic and terrestrial). They represent the created situation, through which the teacher asks questions to

the students on the background of a suggestive image and the subjects discover themselves the following elements (Fig. no 1):

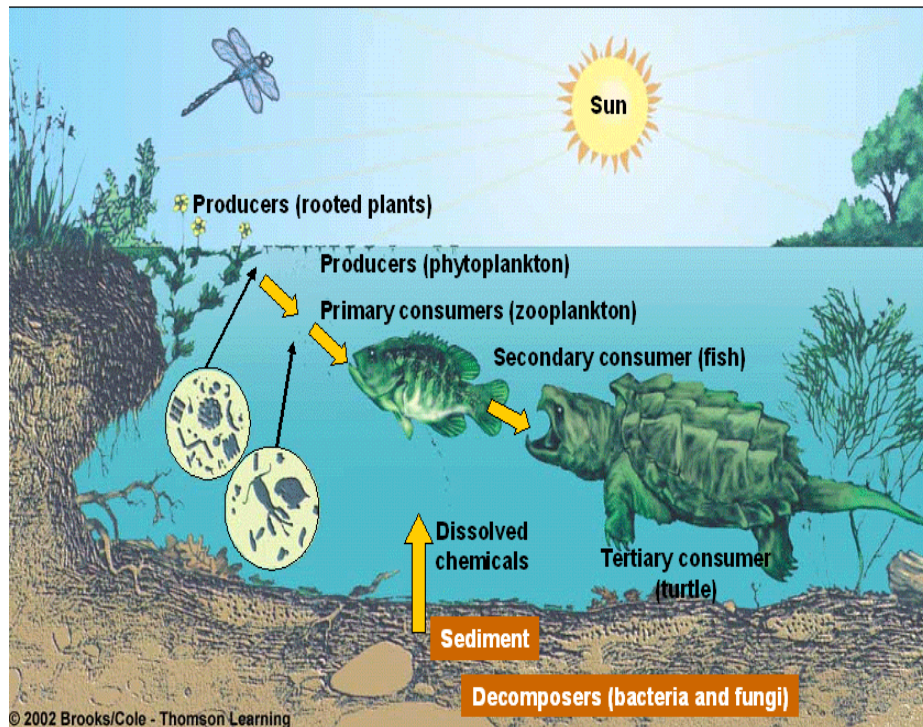


Fig. no 1 a. Aquatic ecosystem. The ecosystem represents a functional subunit of the biome naturally delimited. Within the ecosystem, there are clearly delimited the two essential components: The biotope (habitat) or the physical environment. The biocenoses (the plant or animal community). The ecosystem is an open system, the characteristic structure and functionality of which are imposed by: - The energetic flux; - The matter circulation among the biotic and abiotic components. In the case of most of the ecosystems, the energy flux comes from solar radiation. Part of it is captured and used by the autotrophic organisms that transform the mineral substance in organic substance through photosynthesis. Through the trophic chain, the organic matter is used as an energy source by the heterotrophic organisms, thus joining the ecosystemic circuit. Through the trophic chain, the organic matter is used as an energy source by the heterotrophic organisms, thus joining the ecosystemic circuit

- the essential components of a ecosystem (the biotope or the habitat, physical environment, and biocenoses or plant and animal community);
- the structure of a ecosystem;
- they infer the functionality of a ecosystem imposed by the energetic flux through solar radiation and matter circulation among the biotic and abiotic components;
- they define and explain the functioning of the trophic chain;

- they argue the balance and the appearance of the unbalance within an ecosystem.

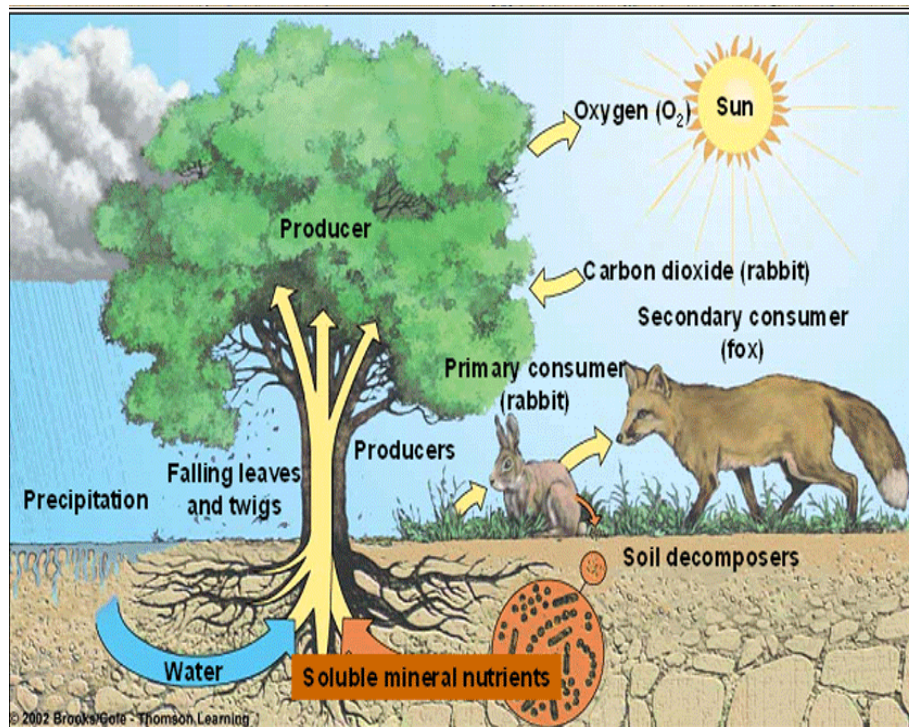


Fig. no 1 b. Terrestrial ecosystem. A typical trophic chain refers to the transformation of inorganic matter from the soil, air, water into organic matter (grass, plants, trees, algae) through the process of chlorophyllian photosynthesis. By means of primary consumers (herbivores, larvae, mollusks), the vegetal organic matter is transformed in proteins that will become a nourishment source for secondary consumers (predators, birds, fish). After their death, there interfere the decomposers (bacteria, funguses) that decompose the organic matter in primary elements that make up the soil, atmosphere and hydrosphere, thus re-entering the ecosystemic circuit

At the subject *Meteorology*, we use as an example a sequence of the theme *The cyclones* referring to the definition and features of the tropical cyclones where the organization of the content was achieved in a focalized system on two columns: on the left, there is rendered the information and, on the right, they are correlated with the explanatory drawing, satellite images that illustrate come cyclones from the Indian Ocean (Fig. no 2, Fig. no 3, Fig. no 4).

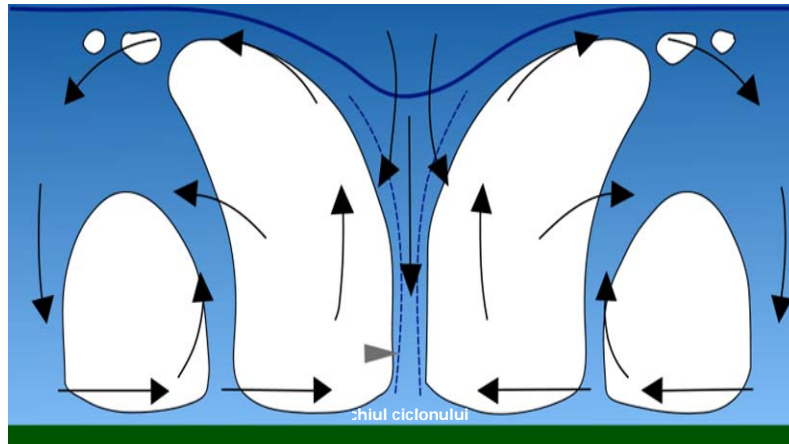


Fig. no 2. The structure of a cyclone.

CHARACTERISTICS:

- small surfaces, average diameters of 500-700 km (very rarely larger than 1,000 km); symmetrical (they do not have atmospheric fronts); contoured by almost circular isobars; atmospheric pressure at the core frequently reaching 950-970 mb.; in the central part of fully developed tropical cyclones, there appear an area where the air moves downwards, called “eye”; here the weather is characterized by calm and clear sky, even if the sea may be extremely rough; the cyclone eye generally displays a circular shape, at least at the terrestrial surface, with diameters of 30-50 km; at the exterior, there appears a cloud wall that may reach the upper limit of the troposphere.

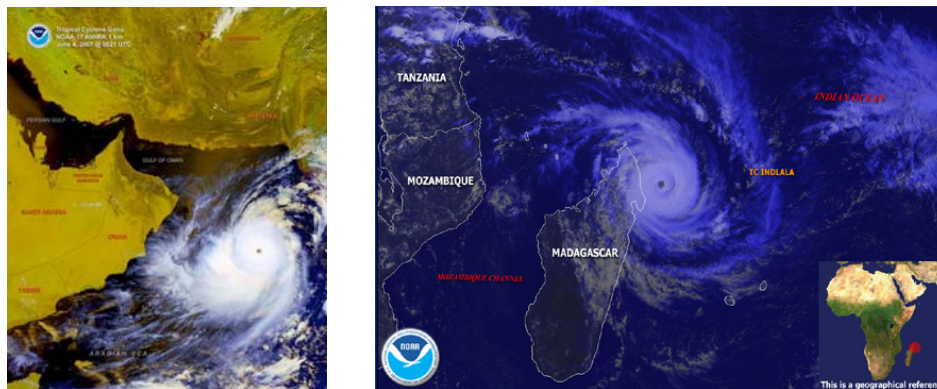


Fig. no 3, 4. Satellite images illustrating the Indian Ocean Cyclones

Sursa: http://earthobservatory.nasa.gov/Library/Hurricanes/Images/hurricane_section

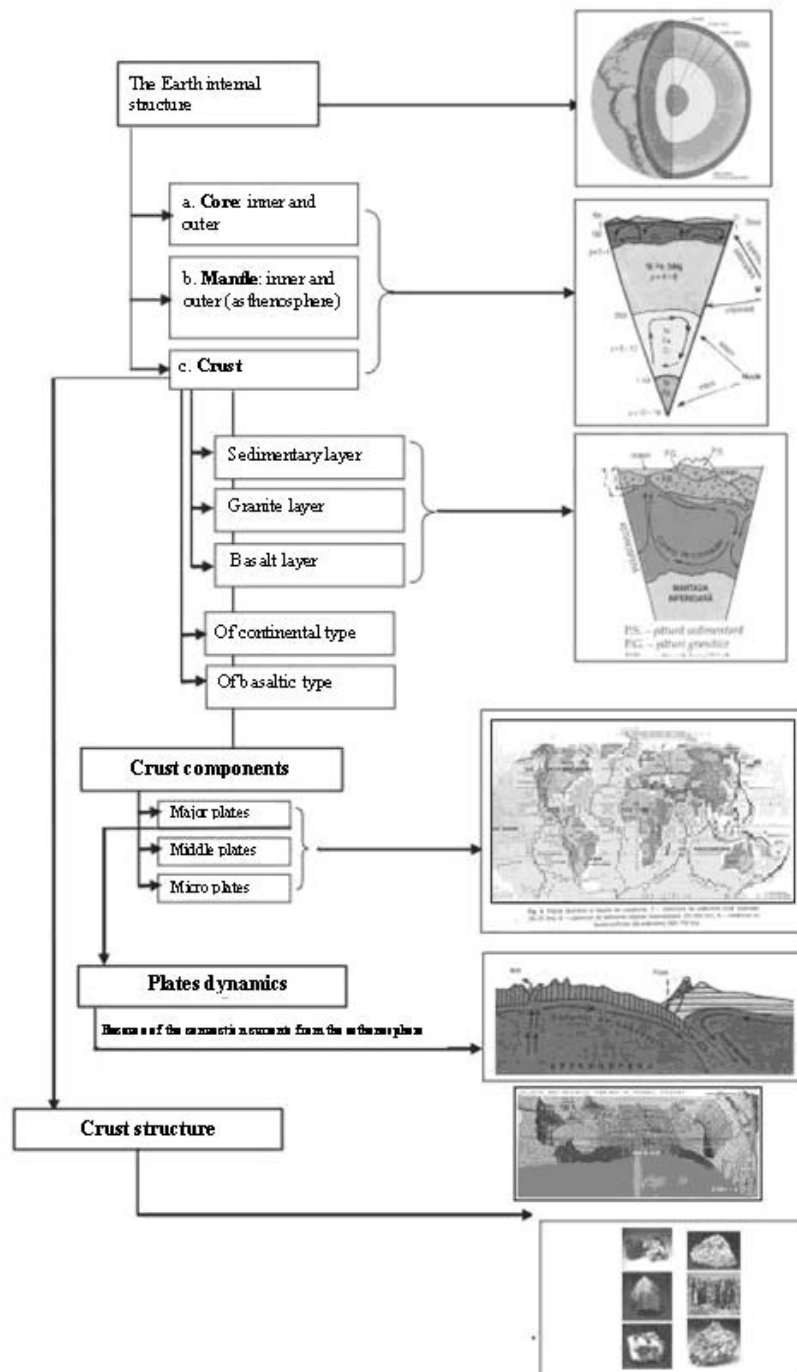


Fig. no 5. The internal structure of the Earth and the crust dynamics (Logical Scheme)

It is worth underlining the high degree of abstractedness in knowing these phenomena.

Another example specific to the content from *Geology* field, which is also compulsory for explaining the evolution of the landforms, refers to the theme “*The internal structure of the Earth and the dynamics of the crust*”. The features of this content impose successive passages from concrete to abstract and vice versa, in order to understand the multiple elements and phenomena that take place inside the Earth and the way they reflect themselves at the crust surface (Fig. no 5). This content displays a wide range of notions and geographical and geological concepts that impose certain didactic means that are diverse by conception and graphics.

There is used another type of didactic material, namely the foil with the logical scheme projected with the projector. It is made up of a system of explanatory drawings and cartographic support, logically structured so that there are generated concrete situations of communication, interpretation, argumentation in an interactive teacher-student system.

- In all the examples presented as active strategies in the educational process we insisted on using projected *images* that represent the expression of a real object or phenomenon ensuring thus *the sensorial knowledge* or *intuition* that holds many didactic functions.

- Intuition is an information source that appears as *representations* for the *processing* and *approaching the generalizations*. After this processing, there occurs the transition from *concrete* to *abstract* where the thinking leads to a deeper knowledge of reality by surprising what it is *essential* and *general*, namely the reaching of *abstractedness*.

- In the rendered sequences, there can be noticed the alternance between concrete to abstract, sensorial and rational proving the idea of their unity in the knowledge process and stimulating the efficiency of thinking.

- The expositive-heuristic didactic strategy, by using video devices that ensures the projection of the didactic materials, which are selected by the teacher for the teaching-learning process of the content of different subjects from the study plan, answers to a series of demands:

- keeping the essential information from science evolution, new research and their development tendencies;
- assimilation of notions and concepts characteristic to the logics of geographical sciences, of interpretation ways, of phenomena and processes, as well as the formation of interdisciplinary approach skills and habits;
- balancing the presentation of theoretical and practical information and achievement of interactive teacher-student communication situations.

- ***The influence of the utilization of didactic technology and strategy in the upper education upon the students' initial formation as future teachers of Geography***

- The student becomes a direct participant in his/her own instruction through

the interactive communication started by the teacher;

- The harmonization of the scientific logics with the didactic logic at the level of the content of different subjects becomes a support, a model for the initial formation of the student that aspires at his/her future activity in the field of education;

- The model of the didactic strategy where the student is integrated contributes to the development of the cognitive interests, of the continuous and efficient learning motivation starting from the initial formation acquired during the faculty to the continuous formation during its professional career.

- *The application of the models acquired during the pedagogical practical period in different schools, experience through which they will get new didactic competences and abilities.*

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