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## **DEVELOPING INDIVIDUAL AND ORGANIZATIONAL ENVIRONMENTAL COMPETENCE**

У статті наводяться дослідження розвитку індивідуальних і організаційних екологічних компетенцій.

В статье приводятся исследования развития индивидуальных и организационных экологических компетенций.

Developing environmental competence is an important challenge in order to achieve the higher level of sustainable development. Environmental competence of individuals and organizations shall be harmonized because the global problems of the world are common. I built up a comprehensive model that allows evaluating and establishing development actions for environmental consciousness. Our task is describing and modelling competences in general. Environmental competence gives only one area of our research work.

The paper summarizes some presumptions, theoretical and empirical background of my work. Environmental knowledge and attitudes are highlighted because these factors have elementary importance. My diagnosis is distressing; the results show that there is a huge lack in the knowledge of adults.

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**Keywords:** environmental competence, environmental consciousness, evaluation method.

**Introduction.** The TAMOP-4.2.1.B-10/2/KONV-2010-0001 project with support by the European Union, co-financed by the European Social Fund aims improving the quality of higher education by establishing excellence centres for strategic research areas of the University of Miskolc. The project runs between 2011-2013.

There are four excellence centres defined which cover the professional skills of the University of Miskolc. Mechatronics and Logistics Excellence Centre gives the frame of organizational researches as well. Dr. Dezső Szakály is the leader of the Scientific Research Group for “Innovative Solutions for the Management of Organizations to Increase Competitiveness”.

Our challenge is to develop new, innovative organizational solutions in order to increase the effectiveness of the production and logistics systems. I think that understanding business and operative processes are essential for us. In general a successful production (and management) system:

- works without errors, failures and human accidents;
- needs less energy, raw material, information etc.;
- produces less waste and pollution;
- works at a lower level of time-need and costs than the alternative (earlier)

solution.

My challenge is analysing the competences in connection with the sustainable development and the possibilities of developing environmental consciousness. The question is important both on individual and on organizational level.

**Competence, competence management.** Competence is the ability to perform a job or activity properly. In a first approach it is a set of defined behaviours that provide a structured guide enabling the identification, evaluation and development of the behaviours in individual employees (Woodruffe, 1993 in Szelestey). Competence can be defined as knowledge and ability for performing certain tasks or roles.

There are various typologies in connection with competences. In connection with organizations and working Szabó (2008:16) summarizes four categories of competences based on the practice-oriented approach of the EU:

basic competences: general and frequent ones that are used in various areas of the life. These give the basis of developing competences of the other categories;

key-competences: general elements of each profession, that is categorized by an EU framework (see later) and can be defined as important competences from a specified aspect;

generic competences: general and independent support of successful work, e.g. importance vision, decision making skills, innovative approach, problem-orientation;

functional competences: special skills and abilities in connection with a specified work.

The European Reference Framework (2007) defines eight key competences that are required for the life long learning:

communication in the mother tongue: ability to express and interpret concepts, thoughts, opinions etc. in both oral and written form;

communication in foreign languages: it has a similar role than communication in mother tongue but it allows the understanding between various cultures and countries;

mathematical competence and basic competences in science and technology: basic mathematical and scientific knowledge is necessary in order to solve problems in everyday situations, and to understand the happening around us;

digital competence: digital communication has a spread role in organization and in our whole life, including the access to learning materials;

learning to learn: the ability to pursue and organise the own learning process;

social and civic competences: social competence refers to personal, civic one to interpersonal and intercultural situations and problem solving;

sense of initiative and entrepreneurship is the ability to turn ideas into action: it involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives;

cultural awareness and expression: it covers appreciation of the importance of the creative expression of ideas, experiences and emotions in a range of media (music, performing arts, literature and the visual arts).

Importance and relevance of environmental competence

Competence measurement and development are key elements of organizational development. Individual and organizational competences shall be harmonized in order to increase the business competitiveness. Knowledge, readiness, preparedness of people as workers has significant effect on the organizational performance as well.

Elementary and higher education system shall prepare the knowledge of students for the successful work but most of the requirements come from the employer. Some elements of knowledge, ability and skills are to learn only in the organization.

Economic science interprets the concept of competence for the organizations as well. The basic idea is not brand new but the modern information technologies and management tools give the actuality of rethinking the content of the topic.

Environmental competence is a horizontal competence i.e. it shall be integrated into factual and other competences. Solving the environmental problems needs the cooperation of various sciences and fields of organizational operation. There is an increasing interest in global environmental problems from the 1960's. The principle of sustainable development (Brundtland, 1987) gives a general approach to the problems by taking the economic side into consideration but it does not define the concrete way of actions. The principle shall be filled up with content in the mirror of the local problems and possibilities. My lecture book (Berényi, 2009) summarizes my results in connection with the organizational level of environmental management.

Varga (2006) analyses the environmental competence in harmony with the eight EU key-competences. His explanation is obvious and it justifies the accuracy of the concept that environmental competence has a horizontal characteristic. We are unable to express our ideas neither in oral nor in written form without the competence of communication. Of course we can not acquire the environmental aspects and information without communication. Communication in foreign language spreads the possibilities. Mathematical and scientific competences are necessary because there are natural and mechanical processes and events in the background of environmental pollution and problems.

Environmental questions, problems and approach are often pushed into background. People and organization are selfish 'formation'. The satisfaction of needs and the limited access to resources can be the main barriers because taking the environmental factors into consideration less money, time etc. is available for the 'classic' goods and services.

In my former research activity I tried to find the organizational reasons in a detailed approach:

- 'business-as-usual' approach overshadows the environmental interest;

- there are problems of information flow, i.e. it is difficult to judge the relevance of information;

- deficiencies in knowledge about factual and environmental questions inhibit the success i.e. organizations do not know the best solutions.

### **Model of environmental consciousness**

There are several models in connection with decisions on environmental consumption. But there are some practical problems of the application. I believe that we shall build up a general model that is suitable to both people and organization and gives frame of both evaluation and development actions. Our environment and the problems are over people or organizations, they are common. In addition consciousness is usually defined as a quality indicator. The comprehensive model (Figures 1-3.) fulfils the requirements.

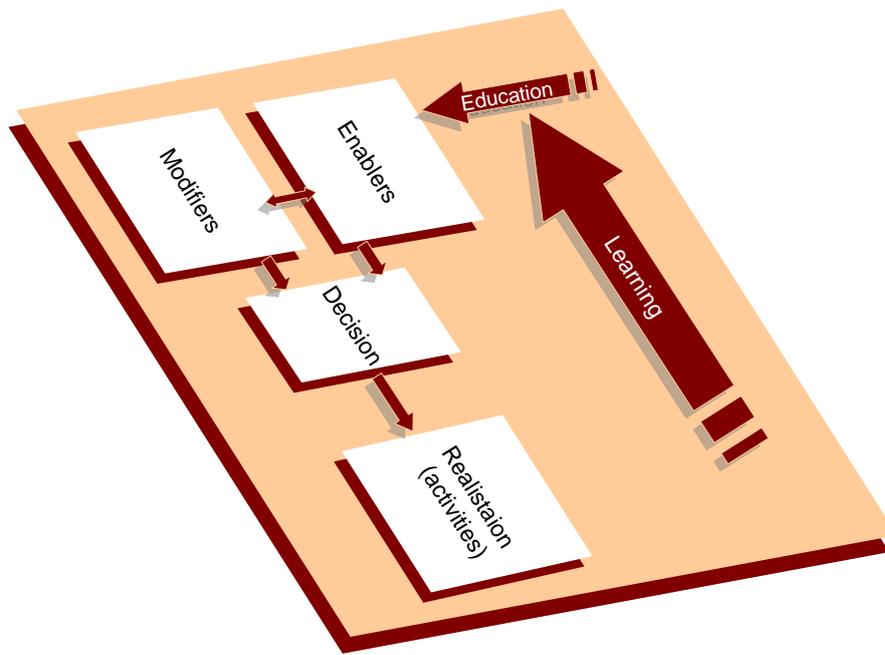


Figure 1- Comprehensive model of environmental consciousness

The comprehensive model uses a new approach. It is based on the process of decision making. Decision is a critical point of the actions. Field of decisions in the model displaces the disposition. We have professional methods for analysing the ways and whys of making decisions, instead of accepting the unreliable introspective reports.

This does not mean, that disposition is outlaw but it shall be interpreted in an other way. Let us think of how we make decisions:

We have specified objectives and a specified level of knowledge. We have conception about good and bad, handsome, useful and ugly. These opinions and the actual knowledge may be difficult to change, we must handle them as enablers.

There are situational circumstances. Being alone, with friends or with family our behaviour may be different. Sometimes these circumstances motivate people to decide inconsistently. This is another conflict between financial possibilities and desires.

Decision-making means choosing between the known possibilities. Realisation is the accomplishment and evaluation of the selected solution.

Learning is based on the evaluation. New experiences will confirm or overwrite the enablers. Next time our decision may be different in a similar situation.

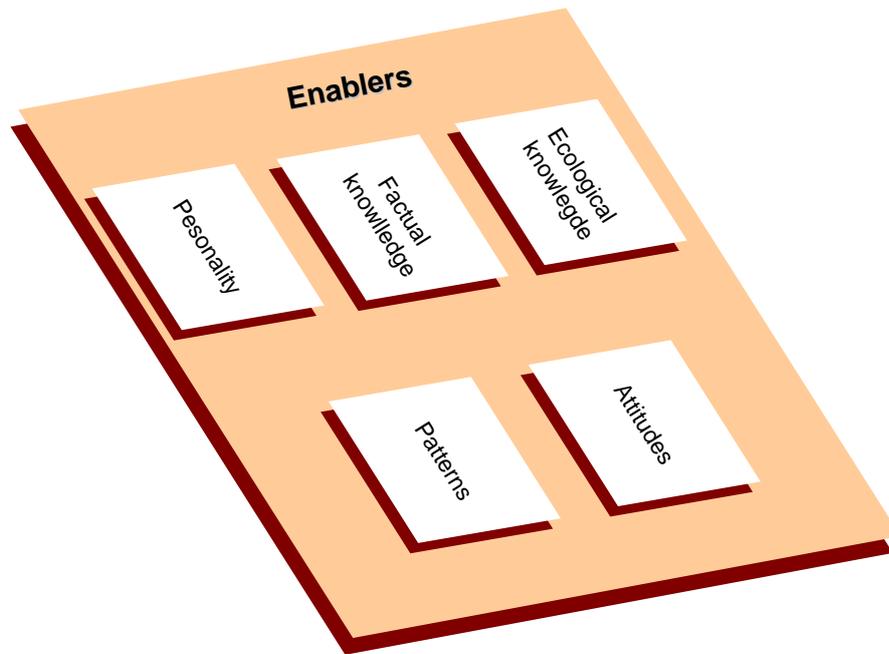


Figure 2- Environmental consciousness – Enablers

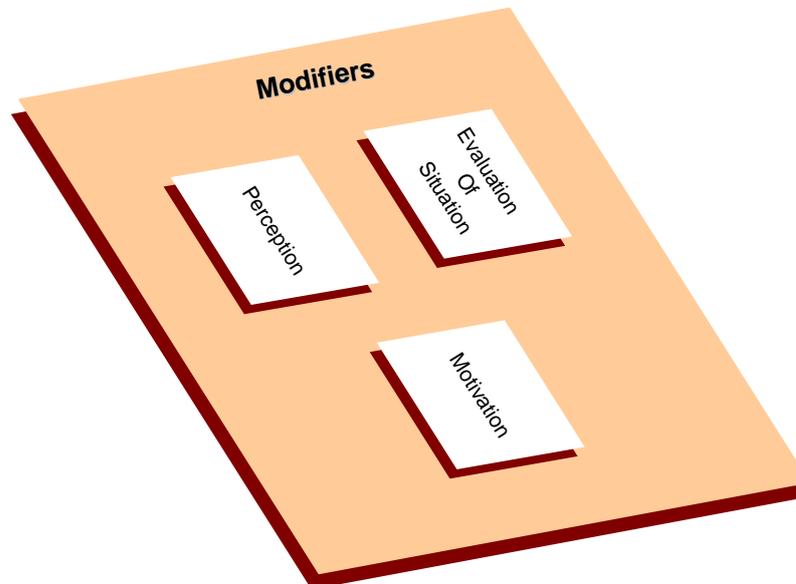


Figure 3- Environmental consciousness – Modifiers

My research activities based on the comprehensive model is wide. In connection with the environmental competence the level of individual knowledge and attitudes are basic influencing factors. In this paper I present some results of this area.

#### Results on knowledge

Figure 4-5. and Table 1. summarize the results on knowledge. Students at the age of 14 may know each answer. I mean the 73.3% result quite low. In general I can confirm the hypothesis of the poor knowledge.

Analysing the answers detailed we can see that facts in connection with living are well known by the students. Geographical questions seemed to be less difficult (the results are beyond my expectation) but physics, chemistry and biology are under the average.

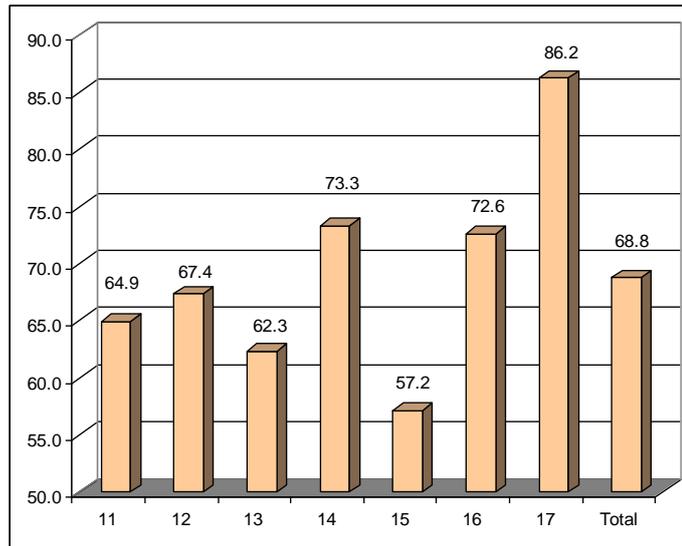


Figure 4- Indicator level of knowledge by age (age, %)

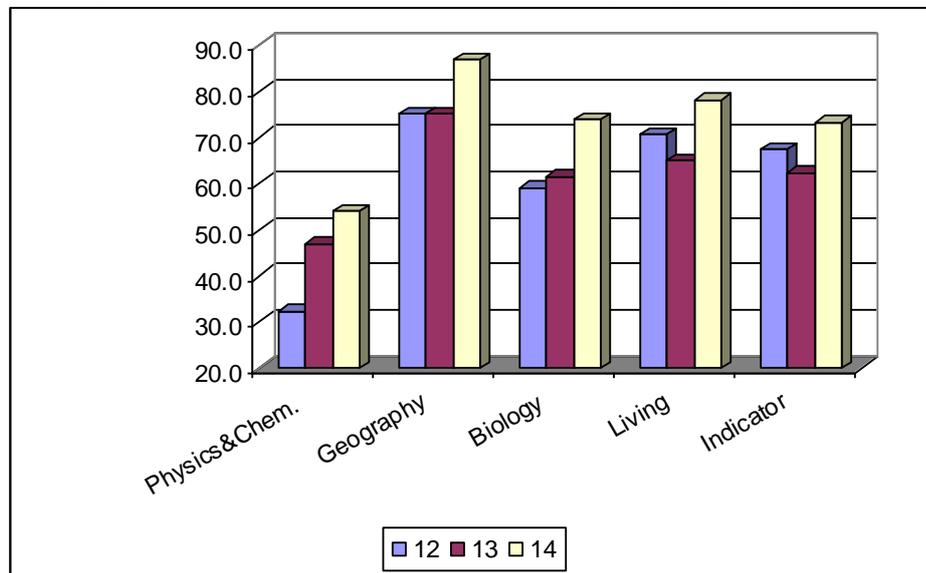


Figure 5- Knowledge by areas and ages in elementary schools (age, %)

Table Results on knowledge by age (%)

| School class | Total | Physics&Chem | Geography | Biology | Living | Level |
|--------------|-------|--------------|-----------|---------|--------|-------|
| 5            | 59.1  | 38.3         | 73.7      | 53.2    | 67.0   | 64.9  |
| 6            | 59.7  | 32.2         | 75.0      | 59.0    | 70.6   | 67.4  |
| 7            | 62.3  | 47.0         | 75.1      | 61.4    | 64.9   | 62.3  |
| 8            | 73.3  | 54.0         | 86.8      | 73.9    | 78.1   | 73.3  |
| 9            | 57.2  | 30.1         | 68.6      | 66.7    | 66.5   | 57.2  |
| 10           | 72.6  | 53.8         | 83.6      | 66.2    | 82.2   | 72.6  |
| 11           | 86.2  | 80.7         | 90.6      | 91.7    | 84.8   | 86.2  |
| Up to 11     | 66.5  | 46.7         | 79.4      | 64.8    | 73.3   | 68.8  |
| University   | 83.6  | 71.9         | 90.4      | 89.5    | 85.2   | 83.6  |

Results on attitude

Results on attitude are presented in Figure 6. Loving the nature is at quite high level. The factor is not especially for measuring the “greening” and commitment of the respondent. It is created for measuring the basis of development possibilities (loving animals, disposition to keeping them, hiking etc.). The indicators of comfort are less cheerful. Comfort is very important for students even against protecting the environment. Sensibility to environmental problems is important but their approach to political and social problems is adverse.

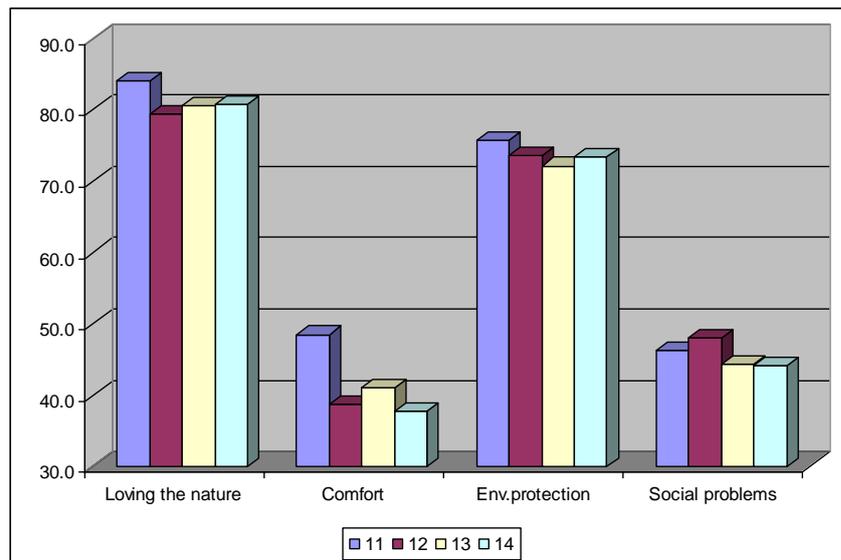


Figure 6- Factors of attitudes by age (%)

I can conclude that:

In general the level of environmental knowledge is quite poor but the results depend on the scientific area.

I hypothesised the higher level of knowledge in a science correlates with the level of other sciences, but my analysis confuted it.

There is no significant attachment between the factors of knowledge and attitude. This means that they can be developed independently.

#### Conclusions

Developing environmental consciousness, especially harmonizing the individual and organizational competences is quite difficult. This paper summarizes that there are lacks and problems of building stones but it is drawn up a comprehensive approach to the future. Our next challenge is placing the environmental aspects in our other models and competences. This is necessary because business and engineering thinking handle sustainability as a horizontal additive to functional questions.

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