



NEW COMPETENCE OF BIOLOGY TEACHER IN THE FACE OF SOCIAL AND CULTURAL CHANGES

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Abstract

Education must constantly be adapted to new needs. Educational tasks determine new styles of teachers' work and also their competences, showing that the effects of the course of didactic process depend on the teacher's awareness to a large extent, way of understanding of the school's reality and the students themselves. Currently the media are ever-present. The teacher must be aware of the influence of outside school interference and psychological barriers related to the communication process. Mass media and hypermedia shape new patterns and new values. The 'overheated' and synthetic announcements often limit the intellectual effort and the critical thinking. On the other hand e-communication is a stimulator of mass education. It requires from teachers use of strategies leading to rebuilding the earlier structure of students' knowledge, creating different structures in connection with new students' concepts and needs in response to new information. The survey research among 45 biology teachers was conducted. Conclusions drawn from research results (analysis of documents and survey) allowed the elaboration priorities for biology teacher training in the contemporary world of media.

Keywords: social and cultural changes, information, communication, teachers' competence

INTRODUCTION

Excess of information connected with new achievements in the field of biology science leads to the awareness of existence of knowledge whose resources are unavailable in the course of school education.

In the course of learning the students' system of values in connection with citizen's, social-political, family and professional roles develops. There also is a view that fast pace of development of science and technology as well as accompanying it civilization changes causes the necessity of moving away from traditional ethics and building the foundations of a new one, capable of facing difficult challenges of the contemporary world. It means mainly: culture and media. It makes

biology education confront opinions, views and interests of various social and professional groups (Potyrala, 2008).

The professional standards are built on categories of competencies, which correspond to the educational aims and school functions and teachers activities in the real school environment. Among main subject, social, psycho-social and communication competence there are: 'to know how to integrate research results and knowledge of particular specialization of teaching subjects and to make links among subjects', 'to be able to search for information and work with information, to cope with the user's knowledge of information and communication technology' and 'to acquire pedagogical communication aids' (Slavik, 2009).

Communication is one of the basic professional skills of a teacher and the concept of medial communication found its legal grounds for realization in connection with the reform of the educational system (Standards of teacher training, 2007). In connection with these tendencies and with changes in the way of biology teaching and in connection with students' interests and their professional life in the future teacher training at university level should take into account the prospective aspect of qualifications (Potyrala et al., 2009). The main ideas about teachers' competence for future are more often focused on mission of schools:

- from initial to life-long learning,
- from knowledge transmission to knowledge creation,
- from formal to non-formal and in-formal learning (Votava, 2009).

The priority for education in the contemporary world of media should be among others relationship between science knowledge and medial culture and improvement of professional opportunities and permanent education (Potyrala et al., 2009).

While planning the research, conclusions and reflections published in the numerous articles written by us have been used. They regarded students' competence against the background of European standards, tendencies in biology education in the light of contemporary social and cultural changes, role and tasks of education in the process of European integration.

In the our teacher training concept are also attributed an important function to the students' dialog relationship in which the teacher appear as a facilitator and the dialog feedback plays a significant role.

The following objectives have been specified:

- 1- formulating general, theoretical assumptions of teaching training with use of different ways of communication,
- 2- studying aspects related to functioning of the models of didactics communication and mediation as instruments for formulating metacognitive strategies in students.

Research problem: What kind of biology teachers' competence are necessary in connection with the social and cultural changes? Research hypotheses: In view of the social and cultural changes the priority is defining a canon of new teachers' skills and deeper understanding philosophy of the

reform. It means mainly: metacognitive competence and ability to use the dialogue ICT-aided strategies.

METHOD

45 biology teachers participated in the survey research and in the attempts of modernizing educational process. One part of the research concerned the self-evaluation of creative and informative competence. Second one was connected with the analysis of the teachers' activities connected with the practical application of different form of communication (tasks) during ICT-aided biology postgraduate studies. The research was also connected with the analysis of the curriculum and teaching standards at university level

FINDINGS

The analysis of the teaching standards points to the fact, that present educational tasks find reflection in syllabuses and educational standards. Their analysis reveals the general tendencies of changes in thinking about the new school of knowledge-based society. A detailed analysis of educational objectives shows in a way the direction of activity at particular stages of education. New educational thinking is governed by two new categories – in the global and local sphere and it specify new competences of teachers. On the other hand the research confirmed the preview that overloading of science and biology curricula, few hours allocated for working on them and perceiving only simple cause and effect relations accompanying the didactic processes by the majority of teachers increase the distance between the student and the concept of metacognition necessary for the possibility of permanent education (Potyrala, 2007).

The evaluations of creative and informative competence of teachers are presented in Table 1. The detailed skills are the indicators of the informative competence.

The teachers defined level of their competence only as high or low. Sometimes they didn't precise this level.

Table 1. Evaluation of teachers' competence (n=45)

TYPE OF COMPETENCE	COMPETENCE LEVEL (% OF ANSWER)		
	High	Low	Lack of answer
pragmatic	66	33	11
communicative	77	22	-
cooperative	33	20	13
creative	55	22	-
computer (informatics)	86	18	11
ethical	66	27	8

The survey results point to the level of the teachers' interests in the new educational media. The majority of teachers declared the sufficient level of their informative competence. The results put also attention on the fact that system of ICT-aided biology and environmental teachers' education is partly adapted to the requirements of information society. The realization of teaching aims partly need help of technology and cooperation, some part of teaching contents need only the ability of information gathering (pragmatic and computer competence) and communication understanding as a simple data transmission (communicative and computer competence). The number of tasks solved correctly by teachers and the level of their communication and mediation abilities is presented in Table 2.

Table 2. Results of the attempts of modernizing educational process as a level of teachers activity with ICT use (n =45)

Teachers' activity	Teachers' communication and mediation skills	Results /percentage of tasks correctly solved/
Collecting information	Valuing	71.1
Interpreting	Critical thinking	48.8
Communicating	Transmitting	77.7
Hypothesis posing	Anticipating	62.2
Creating concepts and theory checking and controlling	Alternative thinking, decision making	50.0

The results confirm the authors, views that necessity of the changes is connected mainly with the fact that ICT and subject education has too small number of links and such skills as critical and alternative thinking aren't sufficiently educated with thought about their utilization in contemporary world of media and technology, permanent education and metacognition.

DISCUSSION

The need of defining a canon of new teachers' skills and including such abilities as: critical and alternative thinking, valuing, transmitting, anticipating and decision making (Table 2) is confirmed by Husa (2009) who precise such terms as:

1- Information literacy - capacity to find, evaluating, organize and present information, 2- digital literacy – information literacy applied to digital information, 3-digital competence – related to logical and critical thinking, to high level information management skills and to developed communication skills.

According to Fisher (1999), the creative process is to a large extent reorganizing the possessed knowledge in order to realize what we do not know. In this context, the application of ICT helps form teachers' and students' competences connected both with creative use of information and

with its creation. Not every sender of information is its creator, but every user of information is its receiver. In school situation, users of information are all the people who use it in any purposeful way (Potyrala, 2007).

The results allow to verified research hypothesis and confirm the previous authors' views that changes in the to-date ways of work and medial/information technology tools use in teaching and learning are necessary (Potyrala, 2007). Necessity of these changes is the consequence of psychical needs of learners in the situation of universal access to information. The changes must regard the teaching, learning and metacognitive strategies. Teachers need much more than just knowing how to operate the computer or specific software. They need to be convinced about the value of ICT tools in supporting and enhancing teaching and learning (Kiridis et al., 2006) They need specific examples demonstrating the added value of ICT in teaching and learning. They also need pedagogical content knowledge on the role of ICT tools in the respective disciplines and how that influences how we formulate learning objectives (Louka and Constantinou, 2007).

CONCLUSION

New canon of teachers' competence must take into account training needs, teachers' and students' individual learning style, strategies of dialogue, work in collaboration. It means preparing teachers to new role: facilitators of students' learning and mediators of different scientific problems. The biology and environmental protection teacher's basic task is not only to pass knowledge, but also to support students in the process of learning, as well as:

- ✓ teaching and organizing students' learning process, teaching what real life is like by multilateral cognitive and practical activities;
- ✓ organization of educational forms, influencing students' attitudes and supporting them in their personal development, as well as mastering the skill of being a true class tutor;
- ✓ care about students, diagnosing, socializing and rehabilitation;
- ✓ supporting students in the formation of their plans, as well as the educational and life plans;
- ✓ cooperation with the family and the local environment, as well as institutions of parallel education;
- ✓ developing the dialogue focused on the child, children's rights and duties, and also integration role of school and family in biology and environmental education;
- ✓ checking and evaluation students' school achievements, analysis of school and educational failures and cooperation with all educational institutions in overcoming them;
- ✓ the ability to organize one's own work and actions aimed at the effective organization of one's own working habits, and to plan one's own professional development too.

Kimber and Wyatt-Smith (2006) point to the educators' need to understand the way of students' learning in digital environments. In their opinion it promotes the development of effective digital learning through the construction of 'students-as-designers' where teachers and students strive to use and create knowledge. Their point of view focuses among others on challenges facing school in order to provide the professional development and material resources necessary for teachers to

develop the types of activities and practices with ICT tools, which extend student capacity for critical engagement and knowledge building.

One can come up with a conclusion that there is a need to extend the research on individual competence which Lyle and Signe Spencer illustrated by means of an iceberg (Spencer and Spencer, 1993). Values are difficult to teach, yet they have unquestionable importance for efficiency and effectiveness of learning. Motives, labour ethics, enthusiasm and own image (the bottom of the iceberg) is not enough to acquire metacognitive skills, and the sole knowledge and abilities (surface and the top of the iceberg) shall not ensure a high level of efficiency of learning. Competence must be characterised by interactivity, which means its constant updating, appropriately to new contexts.

The necessity to develop teachers' skills in the scope of adaptation of students' knowledge to their perception, taking students' interests into account and exploiting them to apply biological skills in everyday life, seems to be the priority.

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