## INFORMATYZACJA SZKOLNICTWA W W PEDAGOGICE POLSKEJ

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Streszczenie. Na początku XXI wieku polscy naukowcy zauważyli stopniowe ponowne rozpatrzenie koncepcji edukacji, jej odrzucenie tradycyjnych form standaryzacji i unifikacji na rzecz indywidualizacji nauki z wykorzystaniem technologii informacyjno-komunikacyjnych, który promuje kształcenie ustawiczne. Artykuł zawiera nowe zasady nauczania, które są główną podstawą środowiska nauczania indywidualnego. Czteryetapowy model IKT w edukacji M. Sysło wyjaśnia pierwszeństwo w metodologii takich jak metod interdyscyplinarnych powiązań, otwartego nauczania, uczenia się na projekt i kształcenia zintegrowanego. Najbardziej znany sposób integracji wiedzy i umiejętności uczniów w ramach różnych przedmiotów akademickich jest praca nad projektem.

***Słowa kluczowe.*** Zindywidualizowane środowisko nauczalne, indywidualizacja i personalizacja, uczenie się na projekt, edukacja holistyczna, praca międzyprojektowa.

## INFORMATISATION OF SCHOOL EDUCATION IN POLAND IN PEDAGOGICAL SCIENCE

***Abstract.*** At the beginning of the XXI century Polish scientists note gradual reconsideration of the concept of education, its rejection of traditional forms of standardization and unification in favour of individualization of learning with the use of ICT that promotes lifelong learning. The article contains new learning principles that are the main basis of the individualized learning environment. Stage model of ICT in education by M. Sysło explains the priority in methodology, such as methods of interdisciplinary links, open learning, project-based learning, and integrated education. The best known method of integrating knowledge and skills of students within different academic subjects is project work.

***Key words.*** Individualized learning environment, individualization and personalization, project-based learning, holistic education, cross-curricula project work.

## ІНФОРМАТИЗАЦІЯ ШКІЛЬНОЇ ОСВІТИ В ПОЛЬЩІ У ПЕДАГІЧНІЙ НАУЦІ

На початку XXI століття польські вчені відмічають відхід системи шкільної освіти від традиційних форм стандартизації та уніфікації на користь індивідуалізації та персоналізації навчання за допомогою ІКТ, що сприяють безперервному навчанню протягом усього життя. У статті подані новоутворені принципи навчання, що стають основним підґрунтям зміненого індивідуалізованого навчального середовища. Чотирьохетапна модель розвитку ІКТ в освіті М. Сисло пояснює пріоритети методології навчання, такі як, методи міжпредметних зв'язків, відкритого навчання, проектного навчання, інтегрованого навчання. Найвідомішим методом інтеграції знань, вмінь та навичок учнів з різних навчальних предметів стає проектна робота.

***Ключові слова:*** індивідуалізоване навчальне середовище, індивідуалізація і персоналізація, проектне навчання, холістична педагогіка, міжпредметна проектна робота.

Creating knowledge is the main function of the information society (Kosmala J., 2008, p. 26). The presence of the information society in the learning process produces a challenge connected with difficulties in coordination of the traditional task of education – the transmission of standard set of knowledge – with the new requirements of the Lisbon Strategy in the field of human capital development such as the employment growth in the information sector, an ability of workers to solve non-standard tasks with the help of technologies. In the last decade of the previous century P. Drucker (Drucker P.F., 1999, p. 158) noted that 'technological revolution – microcomputers, direct transmission of satellite data in the classroom – has already been at school. The ways of learning and teaching will change in several decades. As a result, economics of education will alter completely'.

D. Morańska (2011, p. 109) stresses that modern education 'is looking for new solutions that are relevant to current requirements of optimal use of the opportunities offered by technologies to provide personalization in human development. (...) This causes a change in the perception of learning, in the role of teacher and student in the modern school, focusing on people, their place and role in the new society. (...) The key issue is how modern technology will be incorporated into the learning processes'.

S. Kwiatkowski, A. Bogaj (2000) and J. Kosmala (2008) point to the tendency of gradual reconsideration of the concept of education, its rejection of traditional forms of standardization and unification in favour of individualization of learning. According to M. Sysło (2008, p. 4), the use of ICT promotes 'individualization and personalization of a comprehensive educational approach to learning that are of paramount importance for lifelong learning at the end of formal education at school'.

Modern learning principles that directly influence the processes, have become continuity, interactivity and integrativity of learning in the changing conditions of life in the information society (Kosmala J. 2008, p. 41; Bogaj A., 2000, p. 7). Z. Osiński (2005, p. 7) highlights the principles of mobility, activity and creativity as a basis for training that has been adapted to the rapid pace of globalization of the world. The transformation in education has been related particularly to the changes in the socio-economic conditions of the country. Technological development in the late twentieth – beginning of the twenty-first century has opened a quick access to the media and contributed to the gradual change in traditional learning. 'Modern students think and behave differently than students of pre-digital era as well as their teachers' (Sysło M.M., 2011, p. 90). As a result, there is a need for fundamental changes in the training model. Future generations should be prepared to solve the problems of life in the information society. Therefore, modern didactic concepts offer the transition from learning factual knowledge (education based on the information transmission and teacher's supervision) to learning strategies to intensify creative activities (training that promotes creativity, collaboration, and practical application of knowledge). The new concept of training and education, according to D. Morańska (2011, p. 112), is based on the definition of R. Schulz (1990, p. 9), which determines creative process as innovation has aimed at culture-activity and self-development.

Thus, education has been fundamentally changed and has become more practical, useful and prepared for lifelong learning rather than remained locked in its own cycle (Musiał E., 2010, p.199). Transformation of learning environment that has occurred due to the rapid development of technologies changed the place and role of teacher and student in the learning process. D. Morańska (2011, p. 115) describes the conversion features of a modern teacher: 'No more the

transferor who represents knowledge, the teacher has become the organizer, animator of the learning process, a person who supports the development of students' thinking and activities. His job is to provide the best conditions for the basis of development. While carrying out these tasks the correct application of modern tools of information and communication technologies is extremely useful'. M. Sysło (2011, p. 90-91) distinguishes transformational phenomenon of the modified 'individualized' learning environment as follows:

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| teacher as the main implementor of the curriculum (core curriculum) | ⇨ | students focus on their interests, needs and opportunities |
| memorising of often non-connected facts | ⇨ | training focused on student skills and achievement |
| accumulation of encyclopedic information | ⇨ | ability to use available information resources |
| pre-arranged training methods | ⇨ | flexible and varied teaching methods |
| limited use of media learning tools | ⇨ | using various media tools to enhance perception and awareness information |
| information in few authorized sources (textbooks) | ⇨ | gaining knowledge from different sources |
| creative activities of students based on fictional examples | ⇨ | student-teacher cooperation in solving real scientific problems |
| limited students' participation in certain types of activities | ⇨ | students' participation in all activities at all stages of education |
| development of key competencies of students | ⇨ | development of creative thinking of students that promotes the development of innovative and original solutions |
| learning within the class-task system | ⇨ | gaining experience outside school learning environment |
| focus on school and local environment | ⇨ | activities and participation in the life of global information society |
| individual stages of formal education at schools and universities | ⇨ | preparation for continuous lifelong learning |
| isolated use of technology | ⇨ | technology integration in the learning process |

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| use of independent information and communication systems | ⇨ | convergence of information and communication systems |
| isolated assessment system of student achievements | ⇨ | assessment integrated into the learning process |
| lack of awareness about the dangers of open communication sources | ⇨ | prevent threats to the digital world |

Table. Changes in learning environment caused by technology development (Sysło M.M., 2011, p. 90-91).

G. Gregorczyk (2011, p. 97) explains changes in teaching methodology integrated with information and communication technologies, based on the stage model of ICT in education proposed by M. Sysło:

**1. Emerging stage.** The emergence of technology, recognition of hardware and software, network capacities. The stage provides first purchase of computers and software, exploration the possibilities of technology and therefore the use of technology in education. This stage shows traditional training features, when teacher is the bearer of basic skills in ICT. Educational ICT programs for schools include technology and computer skills; awareness of the role of ICT in education is increasing.

**2. Applying stage.** The use of new technologies as a means of learning, such as computer device information processing is occurred. The Internet is a source of information. At this stage technologies complement traditional methods of learning environment in addition to the existing conditions and constant learning.

**3. Integrating stage.** Technology integration into the learning process occurs when the computer and the Internet have become integral to the daily activities at every level of personal and professional life. At this stage curriculum school subjects are integrated with existing devices in schools and educational means of information and communication technologies: computers, interactive whiteboards, multimedia players, digital projectors, e-Learning, interactive software.

**4. Transformation stage.** Transformation of educational environment occurs simultaneously with changes in learning and existence of school as an educational institution that operates in the local environment. Means of information and communication technologies integrated into training programs are an effective tool in teacher-student support and co-operation, active didactic tool in the process of obtaining knowledge. Computer is an integral part of the teaching profession, and therefore, a close interaction of gradual learning at all stages of formal and non-formal education is created.

This model reflects the development of any new technology in education and can be applied as an example of the advent of computers and the Internet, and now reflects the initial stages of interactive whiteboards and e-learning platforms implementation at school (Sysło M. M., 2009, p. 8). The author proposes to use this model for the assessment of informatization of school education and planning further development of information and communication technologies in education as a current assessment of progress of the planned tasks (Gregorczyk G., 2011, p. 99).

The core curriculum of secondary and high school in Poland (Dz.U. z 2002 r., Nr 51, poz. 458.) among the components of the comprehensive development, key competencies and skills of student, involves skills in searching, gathering, ordering and use of information from various sources with the help of information and communication technologies. This means that the duty of

a teacher is to prepare student to operate information and solve problems with technology solutions that create conditions for acquiring successful key competencies of student. This requirement of school education is associated with a new approach to the interpretation of the role of school in life, rethinking the philosophical foundations of classical pedagogy.

In the reality of the XXI century Herbart education model, the basis of which is to guide and control people using encyclopedic knowledge of subjects that are simplified equivalent of academic disciplines, has been ineffective, outdated model of school (Osiński Z., 2005, p. 6). Z. Osiński (2005, p. 8) considers holistic pedagogical model as successful alternative bases and principles that meet the challenges of modern life in the information society.

New interdisciplinary pedagogical approach introduced in the 1990s by Polish scholar A. Szyszko- Bohusz, is called **'holistic education'** (Szysko-Bohusz A., 2011, p. 22). The term 'holism' (Greek: Holos - whole, complete) are valued and used to outline a holistic approach to organic phenomena [Zabolotna A., 2012, p. 225). Holistic education stands against formalism and routine in the educational and formative processes (Szysko-Bohusz A. 2011, p. 23). The basic principle of the pedagogical approach is integrity – the educational process is taken place in the contemporary socio-economic and cultural reality, it takes into consideration 'local current political and worldwide situation' (Szysko-Bohusz A., 2011, p. 23). One of the main sources of philosophical principles of holistic pedagogy is globalization associated with common culture and universality of human aspirations and needs (Zabolotna A. 2012, p. 227). Z.Osiński (2005, p. 8) highlights the main task of holistic pedagogy as presenting a coherent picture of the world to students and their preparation for further independent life in a changing environment. Holistic education uses methods of interdisciplinary links, open learning, project-based learning, integrated education (Osiński Z., 2005, p. 9; Zabolotna A., 2012, p. 227).

According to Z. Osiński (2005, p. 8), interdisciplinary integration *(integracja międzyprzedmiotowa)* was introduced into school curricula by 1999 – 2000 education reform in Poland under the influence of the holistic pedagogy. This view is shared by other Polish researchers (Gurbiel E., 2001, p. 2). E. Gurbiel and authors (Gurbiel E., 2005, p. 46) consider integration of information and communication technologies in all school subjects as one of the fundamental innovations of school reform.

The term *'integration'*, a common understanding of which is the union (Ivasyshyna T.N., 2010, p. 113), in the field of school education is used primarily in two ways: 1) a component in the system of training and education presented in cooperation of school administration, teachers and students - is called a vertical integration; 2) remote interaction between teachers and students in a class that includes training content and impact on activities of the educational process called a horizontal integration (Lisowska M., 2005, p. 3).

Interdisciplinary integration, by the definition of W. Okoń (Okoń W., 1992, p. 97), is 'correlation of the related topics (...), which promotes synchronized study of related school subjects, or a significant association of these subjects contents. 'Therefore, integration system at school presents a comprehensive interdisciplinary solutions to complex scientific problems, selected by the teacher so as to intensify the interest of students, thus creating a harmonious and coherent lesson atmosphere. The emphasis in elementary school is on developing skills in order to gain knowledge, in high school gymnasia level – to enter the world of scientific disciplines where training method of holistic study of the problem requires interdisciplinary relations (Kaniewski J., 2008, p. 7). Integration of school subjects could be concentrated on a scientific problem or on a real life situation.

The three model complex of disciplinary integration has been identified by Polish scientists:

1. monodisciplinary model (one subject model) – creating a coherent picture of the world to students by incorporating some examples from other disciplines;

2. multidisciplinary model (many subjects model) – a problematic study when we look at one problem from different points of view defined by various school subjects;

3. interdisciplinary model (cross-curricula model) – a phenomena holistically considered using knowledge on various subjects when we make a path across subjects, looking at reasons and results of some issues, and trying to explain the connection between them by using knowledge from different subjects (Osiński Z. 2005, p. 9; Gurbiel E., 2001, p. 1].

The most popular method of integrating knowledge from different subjects is project work. An educational project is a kind of the long-term task, which is realized accordingly to some principles. The principles are as follows (Gurbiel E., 2001, c. 2):

1. The pupils know objectives and methods of their work.
2. There are deadlines for every stage and whole task.
3. There are persons responsible for the realisation of the task.
4. The standards of evaluation of the work are known.
5. The pupils work individually or in teams.
6. The results of the work are presented in public.
7. The teacher prepares the instruction, which includes theme, objectives, methods, deadlines and standards of evaluation.

According to the forms of presentation there are two types of project work at school which may concern two or more subjects:

- the searching project, when pupils have to collect and systematize some information and present it in the form of interview, essay, album, report, performance, etc;
- the local activity project, when pupils decide to organise any activity in their local surroundings (in school, in neighborhood, in village, in city) (Gurbiel E., 2001, p. 2).

Cross-curricula work can concern one subject, and the emphasis is put on the technical aspect of using ICT tools at every stage of realisation.

The project work of Polish school students is held under the recommendations of National Curriculum, implemented on 1.09.2009 (Rozporządzenie Ministra Edukacji Narodowej z dn. 23 grudnia 2008 r. Dz. U. z 2009 r. Nr 4, poz. 17), which specifies that 20% of school material should be presented in the form of student educational projects. It is recommended for each student to participate in one project work minimum each year of study.

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**Normative acts**

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