Grzegorz Godawa,PhD, Dariusz Martynowicz,MA

Impact of New Technology on the Process of Learning: From the Students' Point of View.

Introduction

Modern technology influences Polish educational system in a variety of ways. On the one hand, teachers are expected to useinformation and communication technology both in class and outside of class, and, on the other, schools often lack appropriate equipment. What is also significant, teachers' attitudes to media and informatisation may vary.

The paper deals with the issue of incorporating technology into the classroom. The first part of the paper presents a reflection on the use of new technologies in education. The results of the research conducted among high school studentsare shown in the second part of the work. This part of the workalso focuses on the most common technological solutions used in the researched school as well as their influence on the lesson plan and the students' perception of their teachers.The research carried out for the purpose of this work reveals that modern technology has a tremendous impact on the process of learning.

New Technologies in Education

The ability to use information and communication technology has nowadays become one of the most important competencies. Thus, its effective use is now one of the requirements which students in Polish schools have to meet at every stage of education.The requirements refer to the key competencies[40]. At the third and fourth stage of education "the efficient use of information and communication technologies" is postulated, which complies with the Recommendation of the European Parliament ondigital competence.New technology in this work isrelated to every multimedia tool which may facilitate the process of learning andimprove the quality of teaching. This term will be interchangeably used with the following terms: new technologies, information and communication technology, ICT for short[41].

The result of immediate access to information has been an increase in significance of digital competence. People no longer have to remember as much information as possible since they can easily find it if need be. However, it is important to be able to

[40]Key competencies are those needed for employment, personal fulfilment, social inclusion and active citizenship. Thus, they are crucial in the process of learning as well as in professional and social activity. Digital competence is currently one of the key competencies set out by the European Parliament, *Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning*, *2006/962/WE*, *Attachment:Key competences for lifelong learning – European Reference Framework*, L 394/15-16,http://eur-lex.europa.eu/legal-content/pl/TXT/PDF/?uri=CELEX:32006H0962. Accessed 12 April 2017.

[41] H. Pitler, E. R. Hubbell, M. Kuhn, *Efektywne wykorzystanie nowych technologii na lekcjach*, Warszawa 2015, pp. 8-12.

assess its reliability. In a way, the Internet use reflects how people function in society or how successful they are in professional life[42].

As information and communication technology greatly affects our lives, it is also necessary in today's classroom. It has long been known that children acquire knowledge with the use of senses – sight, hearing, touch. In the model of multisensory learning,ICTfacilitatesthe educational process and makes it more interactive. In result, students are able to satisfy their curiosity using all senses.

Taking into consideration the importance of technology in students' daily life, teachers should recognize the need to integrate technology in the classroom. The research has shown that on average high school students aged 16 and above use the Internet for 15 hours and 40 minutes a week[43]. Therefore, their habits cannot be ignored. It is also worth noting that according to the research young people go online to look for information (90%), check e-mails (68%), usemessengers (67%) and social network sites (64%) and play games (44%)[44], which poses a challenge for teachers who need to tap into new technologies. Otherwise, they are less likely to be successful.

Taking into consideration the above, it seems worth examining how good teachers are at using technology. According to J. Jasiewicz,"a brief overview of the results of empirical research leads to the conclusion that we know little about teachers' media and information competence (…). There is a scarcity of research which would make it possible to determine the level of their competence and show their attitude towards new technologies"[45]. The research conducted in 2007 produced some interesting findings about the use of technology by teachers. Theyproved to be more technologically advanced than the rest of society and, surprisingly, to be no worse than students in that respect. It would seem justified to conclude with a statement that they are likely to use technology in a variety of ways in class. Empirical research of a quantitative nature which was conducted for the purpose of this workreveals how students evaluate the use of technologyin the classroom.

Research Methodology

Empirical research of a quantitative nature is based on the positivist philosophy.It assumes that there is an objective reality which can be experienced with the use of appropriate tools. The researcher remains outside the research reality as an external observer who examines people's typical behavior[46]. The aim of empirical research is to describe and examine the research problem. Taking these assumptions into account, the researcher aims to formulate a research question[47]. The main question posed in the research conducted for the purpose of this work is:

"How do modern technologies influence the process of learning, the role of the teacher and the lesson plan?"

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[42] D. Batorski, *Stan kompetencji z zakresu edukacji medialnej i informacyjnej w Polsce*, [in:] *Cyfrowa Przyszłość. Edukacja medialna i informacyjna w Polsce – raport otwarcia*, ed. J. Lipszyc, Warszawa 2012, p. 18.

[43] J. Jasiewicz, *Analiza SWOT poziomu kompetencji informacyjnych i medialnych polskiego społeczeństwa w oparciu o istniejące badania społeczne*, [in:]*Cyfrowa Przyszłość. Edukacja medialna i informacyjna w Polsce – raport otwarcia*, ed. J. Lipszyc, Warszawa 2012, p. 26.

[44] J. Jasiewicz, *Analiza...*, op. cit., p. 28.

[45] J. Jasiewicz, *Analiza…*, op. cit., pp. 38-39.

[46] W. Goriszewski, *Podstawy metodologiczne badań pedagogicznych*, Warszawa 2006, p. 41.

[47] E. Szewczyk, *Metodologiczne uwarunkowania pedagogicznych badań empirycznych w szkole*, [in:]*Struktury pedagogiczne w katechezie*, ed. M. Śnieżyński, Kraków 2001, p. 373.

Detailed questions are: “What new technologies are used at school?”, “How do technologies affect the process of learning?”, “What are the changes in the role and perception of teachers who make use of new technologies?

The main hypothesis is: “New technology mayfacilitate the process of teaching and learning and has a positive impact on the image of the teacher”.In order to answer the research questions and to verify the hypothesis, a diagnostic survey was carried out using a questionnaire which consisted of 16 questions.

Most questions in the questionnaire were closed-ended questions. The students could choose from two or more answers.There were single and multiple response questions.Semi-open-endedand open-ended questions were also used so as not to suggest any ready answers.Not all data collected with the use of the questionnaire was included in the paper. Data was gathered in a calm atmosphere. The students were able to work independently, they were given instructions on how to complete the questionnaire and could ask questions if something was not clear.The students indicated their answers by selecting an option orfilling in the appropriate fields.

The research was conducted on 23-24 March 2017 among the students of the *August Witkowski* 5th High School in Cracow. 214 second grade students following different subjects at the extended level were studied, as shown in the Chart 1:

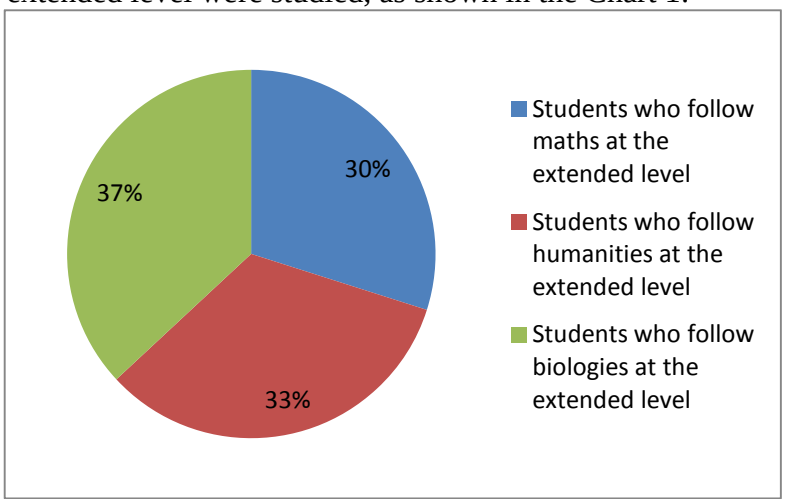

Chart 1. The structure of the researched group – subjects taught at the extended level.

The analysis of data gathered in the present study enabled a more profound understanding of the issue at hand.

Different Kinds of New Technologies and Frequency of Using Them

Answering the question about different kinds of new technologies used in the classroom, the students could choose more than one option. They could also add their own answer.Such a method of formulating questions made it possible to determine all kinds of technology exploited by teachers and to draw the conclusion regarding the most and least common tools incorporated into the classroom.

The kinds of information and communication technologies were determined in the following way: a) text editors e.g. Google Docs, Microsoft Word; b) software to organize thoughtse.g.Webspiration, SmartTools; c) tools to gather, analyse and visualize data e.g. SurveyMonkey, Microsoft Excel, eClicker; d) software used for communication and cooperation e.g. Skype, FaceTime, Facebook, Twitter; e) educational multimedia e.g.

BrainPOP, Discovery Education Streaming, Khan Academy; f) creating multimedia e.g. PowerPoint, Keynote, Photoshop, Prezi; g) interactive educational applications e.g. MathBoard, interactive boards; h) databases and online resources e.g. RubiStar, Visual Thesaurus, Wikipedia, GapMinder; i) technologies used for motion detection e.g. Xbox Kinect, GPS equipment; j) other (please specify). Detailed answers are presented in the Chart 2.

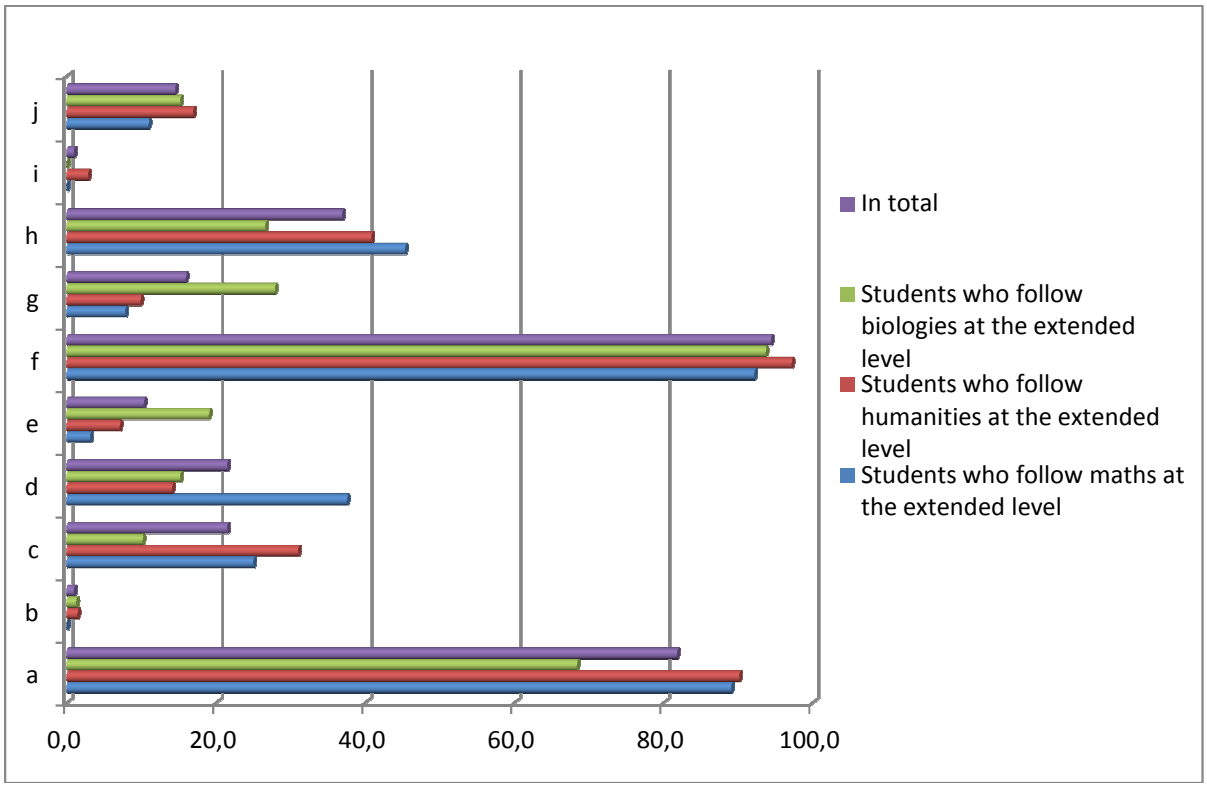

Chart 2. New technologies used byteachers.

It is worth noting that answers to this question didnot reveal any significant differences arising from subjects learnt at the extended level.As many as 94,4% of the students indicated the category of creating multimedia – most probably with the use of PowerPoint. Text editors e.g. Microsoft Word took the second place (81,8%), followed by databases and online resources which were however mentioned just by 36,9% of the respondents.Staggeringly, few respondents pointed out that teachers make use of tools to collect, analyseand visualize datae.g. SurveyMonkey, Microsoft Excel, eClickerand to communicate and cooperate e.g. Facebook. Each kind of technology was pointed out by 21,5% of the respondents. The students emphasize the unfulfilled potential of a variety of tools which may make the lesson content more functional and attractive. It is worth highlighting that merely 0,9% of the students noticed that teachers use technological tools to organize thoughts. Just 15,9% of those surveyed stated that teachers make use of interactive educational applications; 0,9% mentioned technologies used for motion detection and 10,3% noticed the use of educational multimedia. All of these technologies could make learning much more enjoyable.

The research produced interesting findings about classes in which teachers most often exploit ICT. The students were asked to choose three classes in which technology is most oftenimplemented for educational purposes (Chart 3):

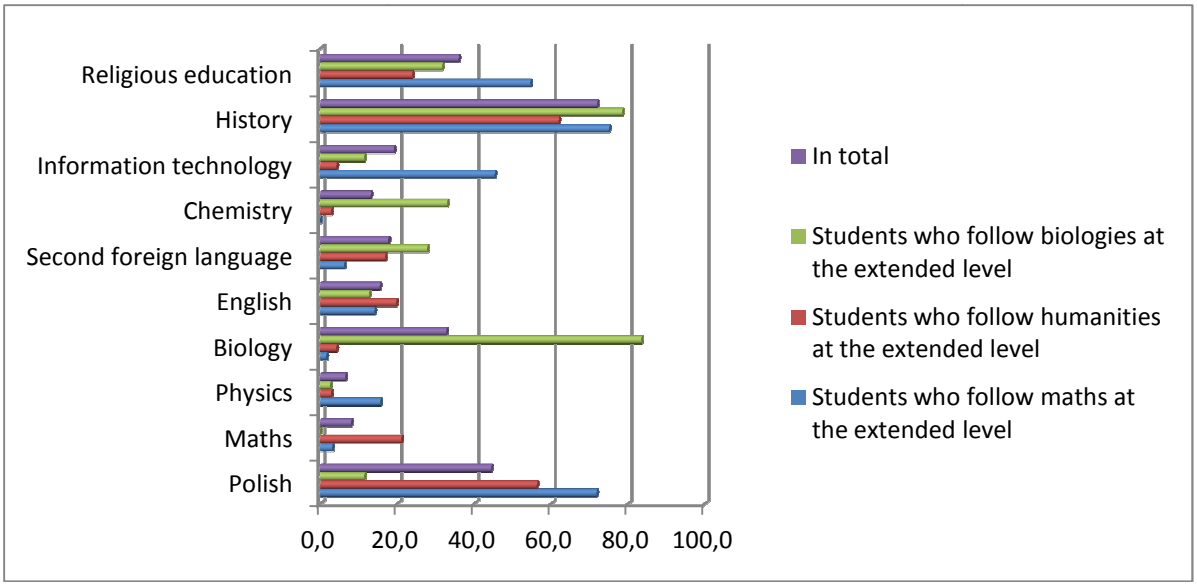

Chart 3. Classes in which teachers most often teach with technology

Data shows that in the studied school new technologies are most often used inhumanities classes.Overall, ICT is used in history (72%), Polish (44%) and religion classes (36%). Teachers also use technology in biology lessons (32%). This, however, results from following biology at the extended level – 83% of the students who follow biology at the extended level indicated biology while other respondents did it much less frequently – 1,6% and 4,2% among the students who follow maths at the extended level and the students who follow humanities at the extended level respectively.It all points to two conclusions. Firstly, following a subject at the extended level may result in an increased use of new technologies in class. Secondly, the use of ICT may depend on the teacher, which is confirmed by the students' answers regarding Polish classes. 56% of the students who follow humanities at the extended level mentioned the use of ICT during Polish classes as compared to as many as 71,9% of the students following maths at the extended level and only 11,4% of the students following biology at the extended level. After verifying the answers, it turned out that Polish language is taught by different teachers in the studied group. Regardless of what subjects the students follow at the extended level, new technologies are rarely used in science classes (maths – 7,9%, physics – 6,5%, chemistry 13,1%). It needs to be stressed that just 19,2% of those surveyed indicated information technology when asked about classes in which ICT is used the most often.

The respondents were also asked to answer a question regarding classes in which new technologies are used the least frequently. Their answers justify the above mentioned doubts. 79,4% of them indicated maths (92,2% of them followed maths at the extended level, 60,6% – humanities and 86,1% – biology). Physical education which took the second place was indicated by 63,1% of the respondents (76,6% of them followed maths at the extended level, 42,3% – humanities, 70,9% – biology). Taking into account answers to the previous question, it is interesting that 33,2% of those surveyed said that technology is most rarely used in Polish classes. The answer, however, depended on what subjects the students follow at the extended level. 6,3% of the students who cited Polish classes follow maths at the extended level, 28,2% – humanities and as many as 59,5% – biology, which confirmsa tremendous influence of the teacher variable on the students' answers to questions in the questionnaire.

Influence of Using New Technologies on the Lesson Plan and the Image of the Teacher

The chart below shows answers to the next question which, as opposed to the previous one, are quite similar in the studied group.

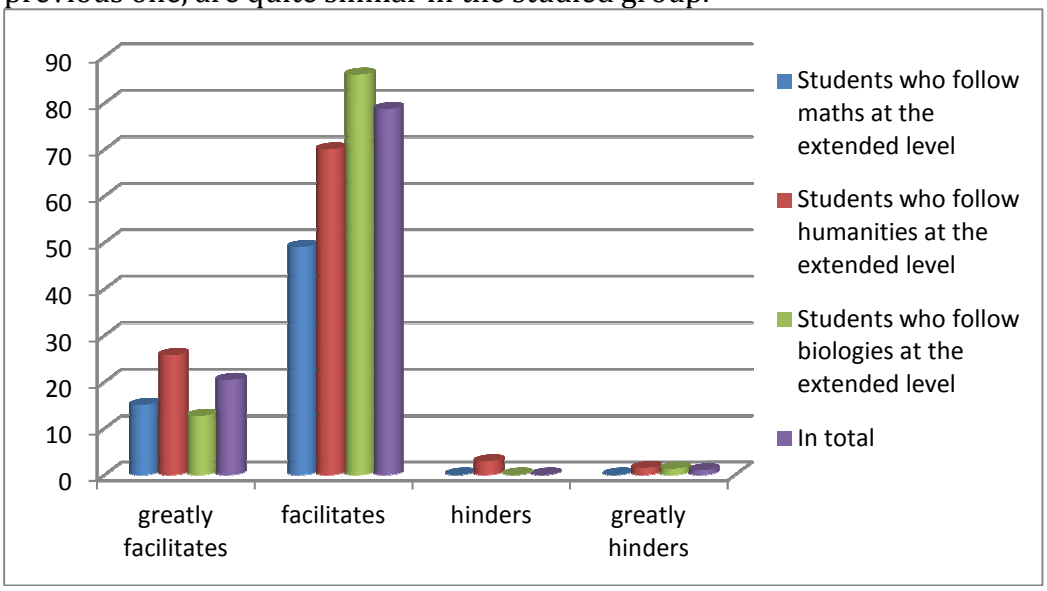

Chart 4. Influence of technology on the process of learning.

Regardless of what subjects the students follow at the extended level,the respondents said that technology facilitates or greatly facilitates the process of learning (78,7% and 20,4% of students respectively). In the next question regarding howICT affects the process of learning, as many as 90% of those surveyed said thattechnology makes classes more attractive, 81% of them mentioned a visible impact of technology on the process of memorizing knowledge, almost 85% said that technology helps them understand new knowledge and 67% stated that technology also has a positive impact on the image of the teacher.

The research produces some interesting findings about the impact of new technologies on the image of the teacher. The Chart 5 shows detailed answers to the question about it.

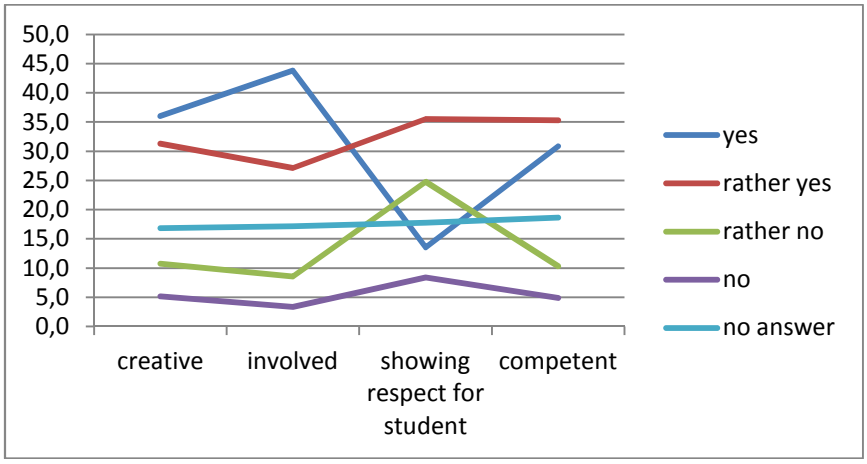

Chart 5. Impact of new technology on the students' perception of their teachers.

It is worth emphasising that the use of ICT affects the way students perceive their teachers. As many as 43,8% of the respondents stated that a teacher who incorporates technology into the classroom is viewed as more involved. 27,1% of them chose the option "rather yes". Some students also said that teachers who use technology are seen as more creative (36% of them answered "yes";31,3% said "rather yes"). What is interesting is that the use of modern technology is associated with more enthusiasm and creativity as well as with more competence. 66% of the students (30,9% answered "yes"; 35,3% said "rather yes")believe that teachers using ICT are more competent.

Research on the use of technology conducted among teachers contradicts the above findings. The report "Youth and Media" reveals that "teachers (…) admitted that they feel greater pressure because information which they introduce in class can be instantly verified with the use of mobile phones (…). There have always been know-it-alls. Now, however, when students can easily access the Internet on their phones, everybody can become a know-it-all"[48]. It probably results from the changing role of the teacher. Today's students need technology in the classroomand"the image of the teacher who (unilaterally) introduces knowledge which students have to acquire is no longer valid.Both students and teachers have unlimited access to information. Therefore, teachers more and more often learn from students about things they have not known before, discover new sources of knowledge and develop new skills"[49]. It is worth noting that a teacher who is willing to learn all the time and is able to make use ofnew technologies and to assess the usefulness of different sources is not perceived as less competent than a teacher who has a vast knowledge of the subject which they present in class. 49% of the students also believe that a teacher who uses technology show more respect for them (13,6% of the respondents answered "yes"; 35,5% said "rather yes").

It may be related to a greater sense of partnership reinforced by media since new technologies intensify informal communication between students and teachers. It all may be concluded with a statement that "respectfor the teacher should be based on (…): the teacher's ability to be a coach and an adviser in the process of acquiring and interpreting new knowledge. Reluctance to use new technology does not help to bridge the gap betweenteachers and students"[50].

Conclusion

The research highlights the impact of new technology on the learning environment, the role of theteacher and the lesson plan. Technology enables students to take more control over the process of learning, facilitates it and makes it more attractive.

The study also shows that ICT incorporated into the classroom is changing the learning environment in a clearly positive way. New technologies enable teachers to diversify their teaching methods. They also offer more educational strategies aimed at different learning styles. The results of the study are in line with other research that has revealed that teachers' attitudes to new technology differ significantly[51]. However, teachers do not use new technology to its full potential and often use it in stereotypical ways e.g. playing videos or showing PowerPoint presentations.

[48]M. Filiciak, *Młodzi i media. Nowe media a uczestnictwo w kulturze. Raport Centrum Badań nad Kulturą Popularną SWPS*, Warszawa 2010, p. 116.
[49]Ibid., p. 124.
[50] J. Serafin, *Potrzeba modyfikacji roli nauczyciela w obliczu zastosowań technologii informacyjno-komunikacyjnych w edukacji*, [in:]"Zarządzanie Publiczne" 2/2009, p. 107.
[51]J. Jasiewicz, *Analiza...*, op. cit.,p. 46.

Data shows an increasing popularity of ICT in case of humanities in the studied group. It also indicates an insufficient exploration of tools in case of science classes.

Summary

New technology is increasingly being used in Polish schools. It influences the way teachers conduct classes, the lesson plan and the process of acquiring knowledge. 214 high school students were studied in the research on new technology which has brought about changes in education. Data indicates that teachers more and more often incorporatenew technologies into the classroom. The students in question believe that technology has an enormous impact on the lesson plan and may greatly facilitate the process of learning. However, in their view teachers do not useit efficiently enough.

The research revealed a lot of interesting findings about changes in Polish schools resulting from the increased use of technology. One of them is related to the changing role of the teacher "at the end of the era of chalk".

Key words: new technology, teacher, student, class

LITERATURE

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