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# E-LEARNING AS A METHOD OF ENVIRONMENTAL EDUCATION IN POLISH SCHOOLS

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**Abstract**

In Poland, e-learning as a tool for education, especially concerning the content of environment is still not very widespread. Very few educational curriculum has been developed using e-learning methods so far. One of them was an e-learning portal "Osobiscie Segreguje" - launched by the League of Conservation - pointing to the problem of municipal waste (http://www.osobiscie-segreguje.org.pl/polski.htm). The program has a hybrid nature combining traditional form of teaching together with online education carried out through computers.

As a pilot stud the course engaged 43 teachers who were obliged to fill out the questionnaire, containing a set of questions about the methodology used during courses and motivation to participate in an online form of education. Following the completion of the website lessons the teachers were asked to evaluate the course, in particular covered material, the method of e-learning and willingness to participate again in a similar course.

Evaluation of this course has been very promising. Teachers who responded to the questions in the evaluation questionnaire rated the merits of the course highly, recognized the use of e-learning as more efficient teaching method and they expressed their wish to pursue other courses related to environmental education using e-learning.

***Keywords:*** e-learning, environmental education, evaluation of the course, municipal wastes

## INTRODUCTION

What should the twenty-first century school look like is a matter of debate not only for students, but also for educational institutions and authorities. The discussion in many academic environments, as well as Polish education authorities, revolves around the quality of education, including e-learning method. The development of e-learning as a method of distance learning is the foundation of the information society (Winnicki, 2009), including Polish schools. Basis of General Education Programme (2009) assumes that students should acquire skills needed to use modern media and know how to select the information so that they can develop independent learning skills (Gajewski, 2008).

E-learning is different from existing traditional forms of teaching, mainly due to the large spatial and temporal flexibility in the implementation of the processed material. It allows the assimilation of new messages in a relatively attractive way, individually tailored to the recipient, as well as studying from any places where Internet access is available (Katterfeld i in., 2007). Distance learning is not just another teaching tool but also a method acceptable among students and binding to this is the high efficiency of the educational process (Fergusson i in. 2009; Way & Webb, 2007).

E-learning can be considered a complement to the traditional learning process. It is therefore important to blend dissemination of e-lessons which uses computers, with traditional lessons that require participation of a teacher. This helps to establish knowledge which is verified via e-learning tests (Plebańska, 2011). Specific to the content in education curriculum, environmental issues associated with sustainable development focused on municipal waste (Gaius-Lankamer and Wojcik, 2010) appear at the stage of early education in the Basis of General Education Programme. Bad management and disposal of municipal waste have a negative impact on the environment and human health. So far in the literature, there have been only few examples of national educational programmes using e-learning method on this subject. Therefore *Liga Ochrony Przyrody* took the initiative to develop the course 'Waste education' and the competition 'I segregate, because I know' using the modern method of e-learning.

## METHOD

The program consisted of two courses: one developed in the form of competition for all portal users and the second aimed at teachers from three regions (Lesser Poland, Silesia and Podkarpackie), who based on teaching materials taken from the website conducted eight teaching units (thematic packages) on the latest news of municipal waste.

Educational materials for the course 'Waste education' were available on a monthly basis , while for the second course 'I segregate because I know' it was available every two weeks. Each module ended with a thematic test to check the students' knowledge. The first course was aimed at teachers from three regions (Lesser Poland, Silesia and Subcarpathian) who chose to carry out eight teaching modules that focused on municipal waste management and ended with a test. 43 teachers took part in the course. Before the course the teachers were obliged to fill in an online survey that included questions about, among others, motivation to participate in the described course. On the other hand the students wrote the so-called pre-test aimed to test their initial knowledge of the waste. Responses from the pre-test were compared with responses in the tests after each individual lesson.

Results of pre and post tests were compared with the results of students' test from the control group who did not participate the course.

The competition 'I segregate because I know' was directed to everyone. It was attended by 124 people willing to extend their knowledge connected with the waste management. The competition was completed only by 25 people, prizes were provided for the best contestants
(Fig. 1).

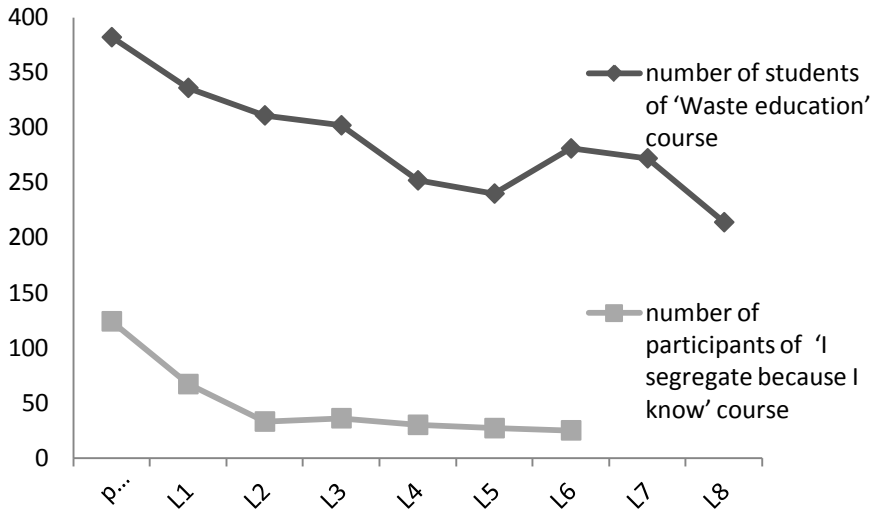


Figure 1 Number of students participating in e-learnig course and the number of participants of 'I segregate because I know'course

## FINDINGS

The study showed that participation in e-learning enhances students' knowledge. Some questions of the main tests (post-test) were compared with the questions of the initial tests (pre-test) completed by the students before the programme. Parallel to the ongoing course and the contest, students of two junior high school classes from Lesser Poland and Silesia region were asked to fill in the same test as taken by the participants of the e-learning course, to checktheir knowledge. 63 students responded this test and the results showed that the . knowledge on municipal waste management of these students was lower than that showed by the students participating in e-learning course. Students were asked about the percentage of municipal waste selectively collected in Poland per year. At the time of research the percentage of segregated waste accounted for only 6.8% of all waste generated in Poland. Most of the correct answers (31%) were pointed by the students who completed lessons on municipal waste statistics. Little more than 3% of correct responses were indicated by the students in the control group (Fig. 2).

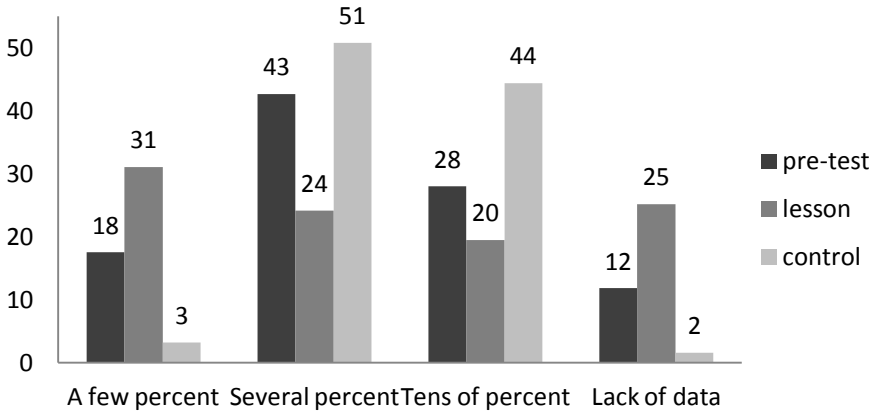


Figure 2. Distribution of answers to the question: How much municipal waste is segregated in Poland per year?

A similar relationship was observed for questions about the percentage of composted municipal waste in Poland. Although half of the students participating in the course indicated a wrong answer in a preliminary test, in the final test of the lesson the correct answer was marked by 90% of the students. In the case of the control group only 3% of students indicated the correct answer.

Answering the question "what are the drink cartons made of?" students in the control group showed the same knowledge as the students joining the course (Fig. 3). However, the number of the correct answers among the students participating in the course increased from 34% in the pre-test to 69% in the post-test.

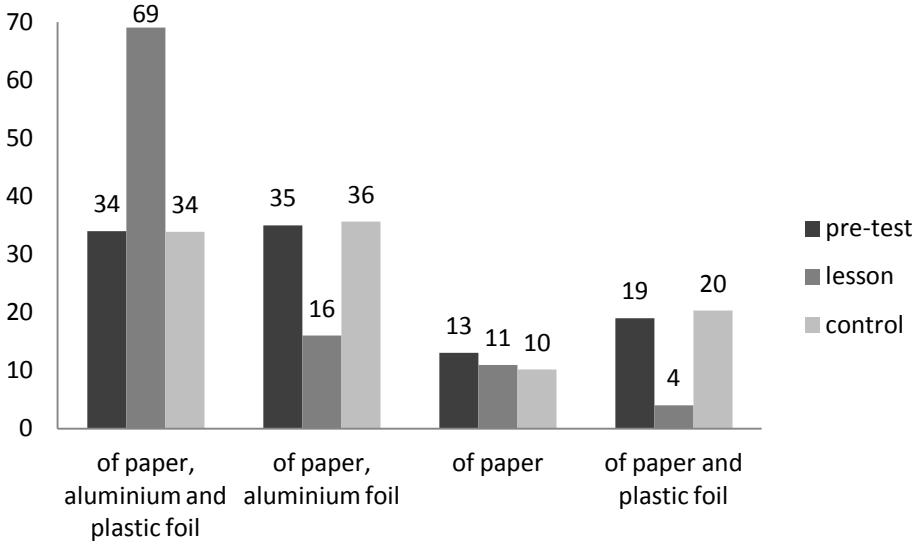


Figure 3 Distribution of correct answers to the question: *What are the drink cartons made of?* indicated in the pre-, post-test and in the control group.

It is believed that the teachers who applied to participate in the e-learning course 'Waste education' were as interested in the subject of municipal waste as their students. They were convinced that students are well-prepared to work with a computer and that e-learning is a highly-efficient method of teaching. In their view, this method should be recommended by methodologists, mainly because it increases the effectiveness of teaching and shortens the time needed to learn the same material using conventional methods.

**DISCUSSION**

In recent years, a significant increase in the use of new electronic tools is observed, including e-learning. As a teaching method it provides access to knowledge regardless of the time a learner can devote and the place of residence, as long as internet access is available (Katterfeld et al., 2007). It is connected with high efficiency of the teaching process (Fergusson et al. 2009; Way & Webb, 2007). The role of the teacher changes; he is not a major source of knowledge but he directs to the sources of that knowledge and co-guides are process. As in the present study, generally institutions integrating e-learning courses in the curriculum have registered strong interest amongst the students, which shows that mixed courses combining traditional teaching in the classroom and e-learning will become a popular method of learning in the near future. (Doering and Miller, 2010).
According to the teachers involved in the e-learning course 'Waste education', students have sufficient access to the Internet to use the materials from this course both at school and at home. However, teachers who completed the course expressed their concern about internet access both at school and at home. Studies conducted among students from 24 classes of junior high school, in three voivodeships, on behalf of the Regional Examination Board in Poznan in 2010 [http://www.scribd.com/doc/53168192/11/Sposob-wykorzystania-komputera] show that access to computers depends on whether we live in a big or a small town. Students who lived in the village used the computer at home computer at home for non scientific purposes for about 8 hours less than their peers in small towns (up to 20 thousand inhabitants). The same studies show that almost 60% of junior high school students do not use computers during the other classes than computer science. This should be considered as clear indication for Polish schools to ensure that the use of computers are limited to the subjects related to information technology.

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