

BLENDDED LEARNING IN POLISH SCHOOLS

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ABSTRACT

Development in technology, changing labour market and the need for lifelong learning necessitate the evolution in the education of children and youth. Blended learning is about combining the online learning and traditional methods in order to personalize the learning process. The intensive application of this teaching method in the United States seems to make the American students more engaged in solving the tasks assigned to them. It is believed that it has a positive impact on their final exam results. The article describes the basic principles of blended learning from the perspective of the theory of hybrid. It also includes some personal experience of working with this method.

1. INTRODUCTION

Recently technology has become a major part of our everyday life. We use computers and other electronic devices for pleasure, work or self-education. In school there are interactive boards, projectors, computers, notebooks and tablets, but teachers' knowledge and preparation for using modern teaching techniques is not always good enough to be sufficiently effective. Otherwise there's a common statement that the old school gives better results so there is no need for a change. In my opinion technology should influence the school not only to make education more interesting but mostly to make it more effective and useful for our growing digital society.

In the beginning, when computers were introduced in schools, there was a lot of researches about using them for mathematical education. The role of computer programs in learning geometry (e.g. Cabri, Geogebra), functions (graphical calculators or plot making programs) or others parts of mathematics was emphasized. Now, when electronic devices are more available for both teachers and students, it's time for considering them as a regular part of modern education. Computer should be used not only as a mere instrument for certain mathematical applications, but they may be utilized for individualization and controlling the learning process. Including

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computers in the teaching process without forsaking traditional teaching methods is possible through **blended learning**. It is a **formal education program in which a student learns partly through online delivery of content and at partly at a supervised classes**. There are four models of blended learning that categorize the majority of blended-learning programs today in the United States of America:

- (1) The Rotation mode -l- students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning. The Rotation model has four sub-models:
 - **The Station Rotation model** – students rotate within a contained classroom;
 - **The Lab Rotation model** – the rotation occurs between a classroom and a learning lab for online learning;
 - **The Flipped Classroom model** – the rotation occurs between school for face-to-face teacher-guided practice or projects and home or other off-site location for online content and instruction;
 - **The Individual Rotation model** – each student has an individualized play list.
- (2) **The Flex model** – students move on an individually customized, fluid schedule among learning modalities where online learning is the backbone of student learning.
- (3) **The A La Carte model** – students take one or more courses entirely online and at the same time continue to have actual classroom educational experiences.
- (4) **The Enriched Virtual model** – a whole-school experience in which within each course, students divide their time between attending the school and learning remotely using online delivery of content and instruction.

The definition of the blended learning taxonomy I presented above was introduced by Clayton Christensen Institute. The founder, after whom the institute is named, is a Harvard professor and well known management thinker. He created a disruptive innovation theory which has applications in business and economy. As the institute conducts research also in the field of education, they published paper analysing blended learning through the lens of this theory. I will shortly introduce the basis of the presented ideas only in education context and its implications to the school program development.

There are two basic **types of innovations** – **sustaining** and **disruptive** – that follow different trajectories and lead to different results. Sustaining innovations help organizations make better products or services to improve

their customer satisfaction. Disruptive innovations do not try to improve products, but they offer a new definition of what's good. Typically, they are simpler and more convenient products which appeal to the new or less demanding customers. In education sustaining innovations are those slow changes which occur in each school every day in order to make teaching more effective. On the other hand, usage of modern teaching methods and strategies; such as e-learning, blended learning, projects, WebQuest or other containing a lot of digital content, demanding team work and information searching skills is disruptive. These methods of education are very interesting for students because they concern everyday problems and give freedom to students. Without going into the details, there are many disadvantages of such methods as well, so that teachers do not choose them very often.

When industries are in the middle of a disruptive change, they often experience a hybrid stage. So do the schools nowadays. In the blended learning method, the Flex, the A La Carte and The Enriched Virtual models are classified as disruptive, while the Rotation models are in the hybrid zone. Keeping in view the technical preparation in Polish school and the teachers' attitude, I think that hybrid models of blended learning are most likely to be introduced to our schools in the near future. My work is to create programs and check if blended teaching can positively impact on the attitude, knowledge and mathematical skills of polish children.

2. MAIN RESULTS

The hybrid models of blended learning are possible to be introduced in polish schools without making huge organizational changes. Below I present the model of the Rotation model in math lessons.

The Station Rotation model is easy to start if the school has at least few mobile platforms; computers, notebooks or tablets or there is a number of desktop computers in the mathematical classroom. Changing modalities during the lesson can be as follow:

- Introduction to the new subject.
- Division into groups.
- Tasks allocation (at least one online).
- Work within groups.
- Students' rotation to another activity.
- Summary of the lesson.

Although the division that is made there does not have to be only group work during the lesson.

For example realizing a subject about equations there might be tasks for three groups as follow:

- (1) Solve equations from exercise in your handbook on your own, then check your answers with a friend next to you.
- (2) Work in group with your friends trying to arrange equations to the text exercises given by the teacher and write them down in the notebook. Solve those equations as your homework.
- (3) Log in into the school learning platform and complete a test named Equations.

For one task each group has about 12 minutes, after that time teacher check students' progress and order a rotation. The move might seem to be an organizational problem, but after establishing rules and the methods, it will become smooth, contributing positively to students' concentration during the actual task.

The Flipped Classroom model might be useful when subject concern practising specific skills. A student learn the theory and solve basic examples when and where he want, basically at home using the online content. During the lesson more complex problems are being solved with the teacher's support. The method is really time-saving and gives opportunity to include more interesting materials in teaching program. Project work can also be done in the Flipped Classroom model. Students look for necessary information at home, mainly by searching the Internet sources that were given to them on the e-learning platform. Then during the lesson they have time for cooperation and project realization with teacher's supervision and complex evaluation.

The Individual Rotation model is difficult to be introduced in schools without major organizational changes. It can be conducted in schools which can provide a computer for each student during the lesson. My proposition for teachers who have students with very different level of mathematical competencies is to have different tasks assigned to each of them depending on their potential. What is almost impossible to do in regular classes, becomes quite simple using e-learning platform. It just needs clear rules and well organization and each student can succeed on their level.

My experiences with blended learning models started with some specially prepared lessons in the primary and the middle school. I present examples of three rotation models being used in different classes.

The Station Rotation model. Subject: Fractions on the number line. Class: 4th grade, primary school.

Firstly, children were divided into groups of four, each student with different level of mathematical competence. The task was to cross-check homework and to make sure that each group member understands the material. It makes weaker students possible to learn with the help of other students in the group, while others repeat important facts and train their skills.

When the teacher recognized an appropriate level of knowledge in every group member, students were asked to do interactive exercises on tablets using the Matlandia program. Otherwise, they were obligated to finish some more tasks on the paper. Playing a mathematical game was a reward for students' cooperation, which reinforce their motivation to help each other.

The Flipped Classroom model. Subject: The history of the numbers. Class: 6th grade of the primary school.

Students did the project on the history of the numbers. The class was divided into five groups, students could group with whoever they wanted. They received particular topics:

- How did the primitive man count?
- The sexagesimal system – is it still actual?
- How was the Ancient Egyptian mathematics?
- The Roman numerals – now and then.
- The Arabic numerals.

All of the materials were accessible on school's e-learning platform, where students discussed about their researches and ideas. Teacher was available on certain time in the chat-room or it was possible to mail her or ask using the forum module. After two weeks of online homework on the project, students began to work during math lessons. They had to cooperate to decide what to do and when or how to work to complete all given tasks.

E-learning platform in that situation facilitated communication and gave better access to all necessary online contents. Each group leader and the teacher could oversee other group members' work and make sure that the task was completed in time.

The Individual Rotation model. Subject: The proportionality and the inverse proportionality. Class: 1st grade of the middle school.

It was a series of lessons about the proportionality, where students had tablets with the Internet access all the time. Instructional films, exercises and tests were available on the school's e-learning platform. Students for three lessons work on their own using online contents delivered at a speed they are comfortable to work with. They decided whether to watch the film with full exercise instruction or not, solving given problems on their own. All solutions had to be written in their notebooks as well. After those lessons and the appropriate quiz, a group of students was picked to receive individual teacher's help. At the same time, others worked on more complex problems expanding their knowledge and skills. Summarizing lessons were conducted in the group working form. That way of teaching gives very interesting and promising results. As the final questionnaire shows, students were very committed to their self-development, they felt responsible for their knowledge. Moreover, they were satisfied because of

their achievements, despite not all of them reaching the same level. I think that more researches should be done in using the Individual Rotation model in order to observe whether it was just one time success or the model has a real potential.

In the USA schools which are teaching using blended learning models usually get specially adjusted software that combine e-learning platform functions with professionally prepared interactive contents. In Poland schools usually have to work with free software, especially e-learning platforms like Moodle or Olat which do not always meet all their needs. In addition, there is not much polish mathematical materials available – neither free of charge nor paid ones, but number of them is growing every moment.

Those inconveniences should not stop polish teachers' progress. The traditional, pen-and-paper lectures are not likely to interest students who live in the colourful world with unlimited access to the information by their mobile devices. Teachers have to strive for their attention and try to sell knowledge like products are being sold by professional traders. Even without best materials we can have influence on students learning process so that education will achieve higher level.

3. FINAL REMARKS

Poland is prepared for modern teaching methods. The General Statistical Office report declares that more than 90% of primary schools and more than 80% of middle and high schools in Poland are computerized. Depending on the type and the location, one school provides one computer with the Internet access to 10-15 students. It is possible to work with the Rotation model where the internet access is not required for all students in the same time. Implementation of the Flipped Classroom model should not be a problem as well because most of the online learning is done at home on students' personal computers, and each school has a computer laboratory where students who do not have their own devices can work after lessons.

Blended learning, which is very popular in the USA, is now possible to be introduced to polish schools. There are many programs that support process of schools computerization and improve teachers' skills in using electronic devices. If polish teachers open up to the possibilities provided by technology, teaching and learning in polish school will move into a new dimension. It will prepare students well for the age of information and technology.

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