USING TABLET AND ITUNESU AS INDIVIDUALIZED INSTRUCTION TOOLS

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ABSTRACT

The paper is aimed at the possibilities of the implementation of individualized instruction in a regular classroom using a tablet and the iTunesU tool. It compares the course of collective frontal instruction and individualized instruction. The results show that the tools make instruction more effective and help increase the students' motivation. The described method of individualization can be easily implemented in a regular class.

1. INTRODUCTION

In the Czech education system, collective frontal instruction with the dominant position of the teacher is used extensively. According to annual reports of the Czech School Inspectorate, the above form of instruction is used mainly in upper primary schools and high schools. However, this form of instruction does not allow for the development of every student's individual skills as the majority of the students remain passive.

Individualized instruction is one of the forms of instruction which is aimed at the development of a child's creative abilities while respecting their needs (Průcha, Walterová, Mareš, 2003). The paper describes the practical realization of a class in which the iTunesU e-learning tool and the tablet are used in order to achieve an individualized approach in a regular class with a full classroom.

The Pedagogical dictionary defines individualization of instruction as "a way of differentiation of instruction where heterogeneous classrooms remain a basic social unit, and differentiation takes place at the inner, content and methodical levels, respecting the students' individual needs" (Průcha, Walterová, Mareš, 2003). Abroad, individualization is perceived in a similar manner. For instance, a study on the need for change in Norwegian schools states that "the individual instruction methods are an appropriate tool to push through changes in the yet uninvolved Norwegian schools" (Carlgren et al., 2006). Moreover, the study also stresses the need to set one's own pace of learning, which it refers to as "self-regulated work". In a regular class is customization of time one of the basic elements of individualization.

The aim of this paper is to compare two types of lessons and to compare the differences in the levels of knowledge acquired through the individualized approach in an experimental group and through the classic frontal approach in a control group, respectively.

2. IMPLEMENTATION OF TWO TYPES OF LEARNING

2.1 Realization of Class in Experimental Group

The described class was 45 minutes long and was attended by 27 12-13-year-old students. All of the students were from the same classroom (first grade of grammar school). The aim of the class was practicing simple equations.

Using the iTunesU tool, a course was created to be used in the class where each student was working with an iPad in the shared device mode. At the beginning of the class, the students were told how to operate the device. Afterward, they worked at their own pace. From then on, the teacher provided individual help to those students who needed it.

The first activity was practicing equations using the Algebra Touch application, in which the student is solving equations with the use of interactive tools – moving terms, distribution of terms, cancelling out terms. Working with the application, the students had to solve 10 equations, writing down only the problem and the solution.

The second activity was a written exercise when a problem in PDF form was inserted into the iTunesU tool. In this case, the students had to not only solve the problem alone, but also had to write the entire solution (including the proof) down in their notebooks. As a result, the tablet was only used to display the common assignment.

The final activity involved Orbit Integers, a game application which is used to practice integer calculations. The application is based on the maximum of 4 students competing against one another in solving problems involving addition and subtraction of integers. The quickness and correctness of the calculation influences the speed of a car on the racetrack. Using internet connection, the application can put as many as four students on one racetrack. The students were divided into the competing groups on the basis of the previous results. This activity develops general math skills of students that are necessary and solving equations.

2.2 Description of Course of Class in Experimental Group and Indentified Observations

The course of the class was monitored by the teacher and a researcher. While the teacher was doing their usual work, the researcher was only there to monitor the students' and teacher's activities and did not become involved in them.

At the beginning of the class, the teacher handed the students tablets, through which they then logged into the iTunesU course using the QR code they saw on the projection screen. The teacher explained to the students what the class would look like, how to work with iTunesU and defined the rules for writing in the notebook. This part took 4 minutes. In two cases, the teacher had to help the students to reload the QR code in order to log into the course.

The students began to solve the 10 equations using the Algebra Touch application. The teacher had reminded the students that they need to write down the problem and the solution in their notebook and then monitored their problem-solving process. The teacher had to help five students with the application as they did not understand the problem-solving process. The remaining students did not find it problematic. However, it was evident that in some case the students helped each other with the application. The activity of the students made transition to the second part of the class easy to monitor. The student that had finished solving the problems in the Algebra Touch application started to write down in the notebook, i.e. stopped using the tablet. It also signalled to the teacher that they could start to evaluate the Part 1 tasks. Moreover, the teacher knew which students had difficulty solving the task and therefore could help them. The transition from Task 1 to Task 2 took 13 to 22 minutes from the beginning of the class.

The second part of the class was regular. The students were writing solutions in their notebooks while teacher was helping them, highlighting errors, telling them to do a proof, etc. Two students realized that they could enter the task into the Algebra Touch application and verify the result. The remaining students then followed their example. As each student used the application different number of times to verify their results, the exact number of students who did so could not be determined. However, it was less than 10 students.

With 26 minutes having elapsed from the class, first students proceeded to the third part of the class. The teacher supervised the division of students into groups. The entire process was natural based on the order in which the students finished the second part of the class. As a result, students with similar mathematical skills were placed in the same group. As the students had already been familiar with the game, they did not need any help. With 35 minutes having elapsed from the class, as many as 19 students were competing. At that time, the teacher checked up on the remaining eight students, helped them finish the current task and allowed them to proceed to the final activity. 6 of those 8 students had 1-2 problems left to solve to complete the

entire set, while the other two 3-4. With 39 minutes having elapsed, all of the students were playing the mathematical game.

With two minutes remaining, the teacher ended the game, repeated the basic rules of solving simple equations and demonstrated them on examples in the Algebra Touch application.

2.3 Realization of Class in Control Group

The control group consisted of 26 students who attended a parallel classroom in a grammar school. Again, the students were 12 to 13 years old. The class was based on the regular frontal scheme. The teacher had prepared a set of equations. To maximize similar content, the equations were generated using the Algebra Touch application. The teacher showed the entire set to the students using a projector. Following the instructions, the students started to solve the equations, writing solutions in their notebooks, highlighting the result and the proof. The teacher helped the students individually. After the students had finished the above task, they were handed a task similar to that of the experimental group. At the end of the class, the students were handed tablets on which they played the Orbit Integers game.

2.4 Description of Course of Class in Control Group and Indentified Observations

The course of the class was monitored by the teacher and a researcher. While the teacher was doing their usual work, the researcher was only there to monitor the students' and teacher's activities and did not become involved in them.

At the beginning of the class, the teacher told the students the objective of the class – to practice solving simple linear equations. The first part of the class started 3 minutes later with the teacher showing the 10 equations using a projector and giving the students instructions. The students solved the individual problems on the blackboard while discussing it with the teacher. Therefore, the teacher paid attention only to the student at the blackboard. Half of the students solved the problems by themselves and then compared their result with the result on the blackboard. Only few of the students paid attention to the teacher. This activity ended 29 minutes into the class.

In the second part of the class, the students solved the tasks on the worksheet the teacher had handed to them. The teacher helped the students individually. The first students finished the tasks 42 minutes into the class. As there were only 3 minutes left, the teacher decided not to proceed to the following activity.

With 43 minutes having elapsed from the class, the teacher learned (by asking the students) that 6 students solved all of the problems, 8 students had 1-2 problems left to solve, 10 students had 3-4 problems left and 2 students had more than 5 problems left to solve. To conclude the class, the teacher repeated the basic rules of solving simple equations using the Algebra Touch application.

3. DISCUSSING RESULTS

The class in which tablets and the iTunesU were used showed optimal distribution of activities, therefore making better use of time which resulted in the students solving more problems. Moreover, the students could practice their skills by playing a game, which the other students could not due to time constraints. Both the researcher and the teacher agreed that the students in the experimental group were more motivated than those in the control group. But this is only a subjective opinion of a teacher and researcher.

Table 1. Comparing the number of solved problems in groups.

Number of solved problems	Experimental Group		Control Group	
	Number	Share of total	Number	Share of total
11	19	70.37 %	6	23.08 %
9–10	6	22.22 %	8	30.77 %
7–8	2	7.41 %	10	38.46 %
Less than 7	0	0 %	2	7.69 %

4. CONCLUSION

The implementation of individualized instruction in a regular classroom with a great number of students is usually difficult. The iTunesU tool makes it possible to replace the dominant position of the teacher with the students working individually. The mobile touch device not only guides the student through the curriculum, but is also used for special activities. Another advantage of the described solution is natural division of students into groups based on their skills. Such division is necessary, especially during competition.

The content of the described class is not much different from the content of the regular frontal class. However, due to the implementation of the elements of individualized instruction, more students are involved in the class. The experiment also showed that the teacher still plays an important role – they had to instruct the students on how to work with the application, help the students solve some of the problems and modify the problem in order to make it easier for the weaker students.

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