IMPROVING THE EFFICIENCY OF THE EDUCATIONAL PROCESS USING SMART NOTEBOOK

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Abstract

Objectives. The aim of the study is to determine the most relevant model of information technology to perform learning improvement. Research methods and techniques. The paper deals with the experience of using Smart Notebook software for giving classes on Information and Communication Technologies in Education for students majored in 550000 Teacher Education and educational program specialization 520200 Physics and mathematics education at Naryn State University named after S. Naamatov. Nowadays, the advanced research direction of information technology development is Smart technology for an interactive whiteboard (smartboard). The most interesting format of classes is the development of multimedia didactic classes and games in Smart Notebook environment. The use of an interactive learning means contributes to advancement of teaching, particularly, mastering course content, reducing the time it takes to solve common tasks, a practical focus on students' skills, development of a positive regard towards the subjects studied, and enhancing students' cyber information awareness. 3 groups took part in the following fields of the experiment: computer science, mathematics, and physics. The math group was chosen as the control group. Findings. As the experience of holding the course with Smart Notebook software applied shows that students are interested in completing their assignments, gaining vocational skills and planing new lessons. Each student was taught through a gamification technique during the experiment. One of the ways to improve training efficiency during gamification is to give participants bonus points to promote better learning. Comparative analysis of outcomes before and after the research allows the authors to decide on the utilization efficiency of Smart Notebook program. The results obtained suggest that the use of interactive teaching aids enhances the vocational skill of a teacher and the development of motivation and activity of students. Future educators should have a contemporary sound academic background in order to make their classes better as far as possible in future, applying the skills acquired while studying at university.

Keywords: Information and communication technologies technology, Smart Notebook, multimedia based didactic lesson, training material, gamification.

1 INTRODUCTION

One of the main tasks of education system is to improve quality in education in skill formation. Various kinds of software applied in education make effective arrangements and provides with a proper methodological

support while mastering vocational training. So, the use of a Smartboard in education opens up new learning opportunities.

As I.G.Zakharova notes, 'World experience implies that dealing with educational problems begins with the vocational teacher training. We will be condemned to stay in the past without the quantum growth of teaching professional competence. In this context, such training of future school teachers and university lecturers is getting of the most immediate interest as it is focused not only on fundamental knowledge in a chosen field (mathematics, chemistry, biology, literature, etc.), in educational science and psychology, but also on common culture, including information. In other words, thorough training is necessary in the field of state-of-the-art information and communication technologies' (Zakharova, 2011).

At present, training is being conducted according to the curricula corresponding to the innovation strategy of The Ministry of Education and Science of the Kyrgyz Republic due to a large introduction of information and communication technologies in the comprehensive education system.

Mastering vocational student teaching requires constant development of information technology education using contemporary computer communications and software (Boyko, 2015).

1.1 Research Review

The widespread introduction of information and communication technologies in all areas of life is observed by T.G. Aleinikov and L.L. Alizarchik. These researchers comment on the relevance of developing university curricula in order to integrate current Internet technologies into academic activities (Aleinikov and Alizarchik, 2018). N.I. Boyko provides insight into present-day teaching technologies, such as mastering vocational student training skills. Boyko gives a review of IT aids classification in the field of curricular application (Boyko, 2015). Virtual trends in the world-wide educational system are viewed by I.G. Borisenko (Borisenko, 2015).

O.Z. Imangozhina dwells on the impact of present-day information transmission technologies used on the training (Imangozhina, 2015). E.A. Petukhova and G.V. Kravchenko focus on the use of project-based learning at a university with information technology applied (Petukhova and Kravchenko, 2017). S.G. Puzinovskaya and O.A. Schesnovich submit the use of ICT in education as a factor in the quality promoting (Puzinovskaya and Schesnovich, 2018). N.V. Burba shows how to use a Smartboard and Smart Notebook software at different stages by the example of a biology class (Burba, 2018). Y. Zhang and L.W. Lu presents the development of effective teaching techniques for the Smart Notebook software (Zhang and Lu, 2008). J.S. Jeong et al suggest using Smart Education as an opportunity to arrange a wide variety of multimedia based lessons (Jeong, Kim and Yoo, 2013).

1.2 Research Purpose

The purpose of the study is to determine the most relevant model of information technology to enhance the effectiveness of education.

2 METHODOLOGY

The survey on using the Smart Notebook environment was carried out when developing the subject *Information and communication technologies in education* by students majored in 550000 *Teacher educations* and skilled in 520200 *Physics and mathematics education* at S. Naamatov Naryn State University. The involvement of 25 students who were planning lessons in their major for high school was examined when studying the course.

At first, students performed some work to study the Smart Notebook environment. They were offered to develop classes, didactic games for high school students.

Each group defends their project using PowerPoint technology at the credit test classes. Students and teachers discuss together the outcomes found out and offer their guidelines for applying the developed study materials in teaching practice.

The aim of the final stage of the study is to test gaining in performance of education experimentally by means of Smart Notebook software. The survey takes one term. It includes two stages: 1st module involves preparing teaching aids, 2nd module consists of experiment arrangements and summarizing findings.

During the experiment, groups majored in 3 fields took part: computer science, mathematics, and physics. The math group was chosen as the control group.

It should be noted that the teaching experiment was based on the generally accepted rules for its use. The

fact is that the test and experimental groups are trained concurrently. A comparative study of the outcomes is carried out after the experiment is completed. Lecture classes are held for both groups simultaneously, but tutorials are held for one at a time.

The first stage of the experiment in February-April, 2019 was intended to make up guidance papers for studying school curriculum. They vary according to their major.

The second stage of the academic experiment conducted from April to June, 2019. It consisted of preparing guidance papers and having 8 lessons in order to assess the initial level of proficiency by means of an entrance test for students in the control and experimental groups.

A gamification technique was used for each student during the experiment. One of the ways to improve the effectiveness of training during gamification is to give participants extra quality credits/points to promote better learning.

The first stage of the experiment is ascertaining. The main task of it is to determine the initial knowledge level on the topics *Software used in career*, *The development of an information and communication resource with multimedia items*, *Preparing ICT-based computer tests* among the students in the control experimental group. The students from three groups were tested with the entrance teaching tests at this stage of the experiment.

The second stage of the teaching experiment is formative. The main objective of this stage is to have classes for students from the experimental group using the interactive software package, and give classes in the standard mode of study for the control group.

After the classes, re-pedagogical testing of students from three groups was carried out in order to re-determine the knowledge level on the topics *Software used in career*, *The development of an information and communication resource with multimedia items*, *Preparation of ICT- based computer tests.*

15 lecturers participated in the teaching experiment.

3 RESULTS AND DISCUSSION

Information technology is valuable in education, in fact. They make an interactive way of learning very lively and bright. Both a lecturer and a student have got a variety of opportunities that can be applied on that purpose. These innovative technologies provide students with good knowledge as well as develop their creative and intelligent thinking. Thanks to them, students often study on their own, learn to find out new data from various sources of information (Lyz, 2009).

At present, training by means of computer technology is changing education, runs a model of an adjusted training. What is the most important thing is an opportunity for students to get prepared by themselves. New technologies, interactive software and teaching and learning aids make education a different mode of interaction. It results in a change of a form of communication between educators and students. Learning motivation determines individual performance. It also requires to develop new modes when giving classes.

The effective use of a smartboard in learning seems very important for the development of students' points, attention to their lessons, enlarging vocabulary, and critical review. It is reasonable to use multimedia Power Point presentations at all stages of various classes with a smartboard. Providing learning material in a form of a multimedia presentaton saves time at the lesson. Making presentations on a smartboard allows one to make the lesson more interesting and innovative. The use of multimedia technologies including a smartboard in the classroom is going to be another advantage when students are explained a new topic. The group produces real communication at such classes. The students try to state their opinion. They are involved in performing tasks. They are not afraid of answering questions. Students have a wish to perform a number of extra tasks in their learning to make progress. They also learn to check themselves when completing practical assignments.

However, the most interesting option for having classes is considered to be the development of multimedia didactic classes, games in Smart Notebook environment. An advanced research direction of information technology development is Smart technology for a Smartboard nowadays. A lecturer should have a skill to work with the special software Smart Notebook to be able to use it in teaching. Smart technologies (Little, 2013) are widely used in current educational institutions. This software combines great opportunities for working with a Smartboard. Therefore, lecturers had better not only managing a Smartboard, but also designing interactive presentations for Smart Notebook classes. Smart Notebook software has an intuitive interface and is easy to learn and deal with. So the development of presentations in Smart Notebook has a great advantage for future teachers to use in training. Smart Notebook environment offers the infinite

possibilities for developing a wide variety of multimedia classes and games (Jeong, Kim and Yoo, 2013). Thus in case students master their skills of dealing with the software perfectly, they will be able to give any lesson they planned, a didactic game which is necessary for holding this or that lesson with it.

As the experience of conducting the course of using Smart Notebook shows, students are interested in completing their tasks and engaged in gaining professional skills. Students use a collection of interactive aids Lesson Activity Toolkit 2.0, and the one of LAT 2.0. and thus they consolidate their will for the lesson learning more. Animated pictures made by students may be used at the organizational stage of a lesson, or when explaining a topic. An option *Notes Displaying* can be used when defining a task of the lesson, the topic, finding out the correct answers. The method *Grouping in Categories* is used at the stage of testing knowledge or summarizing. A *Keyword Selection* technique can be used as a total / general check or at the stage of consolidating material trained. A *Quiz* mode can be used when giving dictations, guessing the correct answers. A screen magnifier is used to highlight an area to emphasize what is significant in the topic being explained.

In practice, the survey was conducted for lecturers and students of the Pedagogical Faculty at Naryn State University regardless of major. The aim was to find out how much the students are aware of interactive tools, and how often they use those means at their work.

In keeping with the findings, the research issue results in a number of questions for a questionnaire developed. Table 1 presents the most commonly used Smartboard software for lecturers.

Table 1. A Smartboard Used by Lecturers

No	The name of software	Number of software used
1	Smart Notebook	36
2	Active Inspire	28
3	Qwizdom WizTeach	21
4	Interwrite	15

The survey involves third-year teacher training students majored in physics and mathematics. The experimental group consists of 25 students. As the results of the experiment show, each student knows that interactive tools are a learning aid. 100% of respondents answer positively to the question if they are aware of what interactive tools (Smartboard) are and they know how to use them for educational reasons.

According to Table 2. 15% of lecturers and 12% of students answer to the question 'Using interactive tools is important for lecturers and students because they can..' that it is possible to integrate electronic training materials and proper test assignments. The survey shows that 25% of lecturers and 24% of students agree that it is more common to design and use training materials in application formats like Power Point Presentation, Word, Excel, web pages. On the other hand, 13% of lecturers and 9% of students experienced an individual approach when working with different students. It admits that an individual approach to learning needs to be reinforced. 25% and 23%, respectively, believe that it is possible to fit educational standards, objectives and curricula that way, while 22% and 32% can integrate electronic training materials and proper test assignments.

Table 2. Answers to the question, *Using interactive tools is important for* lecturers *and students because they can …*

Using interactive tools for lecturers is important because they can…	Lecturers	Students
Use such teaching techniques that make communication with students easier	22%	32%
Provide correspondence to educational standards, objectives and curricula	25%	23%
Apply an individual approach to teach different students (groups of students)	13%	9%
Issue and use training materials in well-known application format (Power Point, Word, Excel, web pages)	25%	24%
Combine electronic training materials and proper test assignments	15%	12%

The positive answer to the question (Table 3) 'Are there any advantages of using interactive tools by lecturers and students?' was given by 11% of teachers and 10% of students. The positive answer to the question 'Is it convenient to work in a large group?' was given by 14% of lecturers and 13% of students. The positive answer to the question if 'they give an opportunity to lecturers to share materials with each other and

use them again' was given by 14% of lecturers and 17% of students, respectively. In addition, according to respondents' views, interactive tools allow one to save and print out the images on a board, including any notes taken at the lesson without spending a lot of time and effort and thus, simplifying the verification of material learnt. 26% of lecturers and 33% of students agree with this statement. Such tools encourage improvisation and mobility, allowing one to draw and record above any applications and web resources. 12% of lecturers and 10% of students, respectively support this passage. 23% of lecturers and 17% of students answer positively to the question, if teachers can explain new material from any place in the classroom.

Table 3. The benefits of interactive tools for lecturers and students

The benefits of interactive tools for lecturers and students	Lecturers	Students
allow one to explain new material from any place in the classroom	23%	17%
encourage improvisation and mobility by allowing one to draw and record above any applications and web resources	12%	10%
allow one to save and print out images on the board including any notes taken at the lesson without spending a lot of time and making much effort and thus, making the verification of learnt material easier	26%	33%
allow lecturers to share materials with each other and use them again	14%	17%
they are convenient when working with a large group	14%	13%
Inspire lecturers to search for new approaches to learning, promote career development	11%	10%

As it can be seen from Table 4, during the experiment, the majority (24%) of lecturers believe that they need to have special skills to be able to work with a Smartboard and develop a methodology for giving lessons with it. 26% of lecturers suppose that it is necessary to prepare the appropriate learning materials for the lesson such as text, graphic, video, photo, sound, Internet resources, etc. 13% of lecturers insist on choosing technologies and tools for a Smartboard to have classes, plan lessons with the software used.

Table 4. When planning a lesson with a Smartboard applied, a lecturer has to follow a number of conditions

When preparing for a lesson using a Smartboard, a lecturer has to follow a number of conditions:	Lecturers
have skills of working with a Smartboard	24%
give educational reasoning for using a Smartboard when studying a specific topic of the subject and develop a methodology for having classes by means of it	24%
prepare the necessary training material for the lesson: text, graphic, video, photo, sound, Internet resources, etc. It is convenient to work using different files to develop a database	26%
choose technologies and tools for a Starboard for the lesson (tools *Shade/Shutter Spotlight*, *Pointer*. *Magnifier, Pointer*, etc.)	13%
to make a plan of a class in the software used	13%

According to the survey carried out, the main drawback of 28% of the respondents for using Smartboards, as lecturers believe, is a high price and their damage.

Table 5. Disadvantages of using a Smartboard

Disadvantages of Using Smartboards	Lecturers
a Smartboard is much more expensive than standard boards or a projector with a screen	28%
the surface of smartboards can be damaged; replacing a damaged surface also costs much	15%

the slide displayed on the surface of the smartboard can be blocked by a person who is standing next to the board	6%
portable smartboards (and projectors) should be protected from theft, damage, etc. more than others. In addition, when using portable boards and moving to a new place, the board has to be configured over (calibrated)	9%
if the Internet access is available for the smartboard, some users may send an unwelcome message or a picture to the screen	12%
design drawbacks of electronic markers. They are thick, the image is slower than the movements themselves even after being graded, so it is very difficult and inconvenient to write with them	8%
a lack or the low affordability of software	7%
too much time required to arrange the class	11%
the necessity to limit work with a Smartboard at the lesson temporarily because of the requirements to follow health standards	4%

Based on the data obtained, it can be noted that much depends on the lecturer's preferences and qualifications. Definitely, one can make presentations using Microsoft PowerPoint as usual. Nevertheless, using Smart-technologies for teacher training students is the most advanced technique. Future teachers should get a high-quality education with innovative technologies in order to enhance their classes to the maximum extent in future, applying the skills acquired when studying at a university.

Using such new technologies, the authors verify in practice that increasing the level of cognitive students' activity let maximize their potential, increase the emotional background of classes. Moreover, it can be noted that interactive software and methodological aids expand the connection between subjects.

4 CONCLUSION

The role played by information and communication technologies, its importance creates optimal opportunities for the activities of the teacher and students, as well as to rationally use the time of this lesson. Because, using an interactive whiteboard, the teacher can download the necessary information several times without wasting time, and you do not need to pre-arrange the whiteboard, but only make a clear, important emphasis on the content of the educational material. And therefore, for the successful implementation of professional activities, future teachers must be competent in working with Smart-technologies.

Future educators should be able not only to use ready-made electronic resources, but also to develop their own, albeit simple, didactic materials (Smirnov, 2013).

Having saved time, the teacher will be able to go through the lesson in depth, enrich it with new materials and achieve the effectiveness of the lesson. This indicates that the use of information and communication technologies makes it possible to evaluate students' knowledge not only in the educational process, but also in independent activity.

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