Educational Games with an Interactive Whiteboard at Professional English Lessons

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Abstract: The paper focuses on the issue of using educational games provided with the help of an interactive whiteboard at professional English lessons with non-linguistic students. The purpose of our research is to check the influence of educational games based on using an interactive whiteboard for students' progress in effective English teaching to non-linguistic students for improving English proficiency. Different methods such as observation, questionnaires, discussions and a pedagogical experiment were used to study the influence of using educational games with an interactive whiteboard in English classes to students' motivation and interest to learn English and, as a result, to the level of students' success in the English language. The statistical methods were used as well to measure the results of the pedagogical experiment. The result contrast of the preliminary and final tests confirmed statistically the efficiency of the authors' technique of using educational games with an interactive whiteboard at professional English lessons. The specially developed educational games provided with the help of an interactive whiteboard are presented as examples of non-standard elements in English classes with students and can be used by any English teachers. The results of the experiment proved statistically the effectiveness of the authors' technique of using non-standard elements for teaching professional English.

Keywords: *Educational games; interactive whiteboard (IWB); English; lesson.*

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1. Introduction

1.1. The problem

In the global world mastering foreign languages is becoming a necessary condition for successful professional career in many spheres. Unfortunately, today secondary school leavers not always have sufficient level of their foreign languages. So, the system of higher education, on the one hand, has to improve the situation, on the other hand, needs to teach professional aspects in the language. The problem is that students of non-linguistic specialties usually are not motivated enough to learn foreign languages.

They believe special subjects to be their purpose and they are not ready to make intellectual efforts to get a success in other subjects. Consequently, teachers of foreign languages need to look for effective ways to motivate their students. We have suggested that non-standard elements (among which there are educational games provided with an interactive whiteboard) at English lessons with professional orientation will help to reach the aim and so to improve proficiency in the foreign language.

Considering games for educational purposes we understand them as a kind of specially organized educational activity, which has strict educational goal and is directed at consolidation of acquired knowledge, development and improvement of certain skills enhancing creativity, cognitive activity and professional competence of this activity participants.

It should be noted that learning potential of games has been known for a long time. A lot of great teachers applied games at their practice and spoke about efficiency of using games in the learning process. But, to tell the truth, games were mostly applied in the work with children. And so there is no surprise that the first system of educational games was created by F. Frobel, and M. Montessori, for preschool education and by O. Decroly, for elementary education.

However, “due to the increasing the flexibility of teaching, expanding the freedom of a teacher’s action, as well as expressiveness, opportunities and high educational potential of the game teachers began to apply games at all levels of school and even post-school education” (Holubnycha, 2018: 19).

1.2. Analysis of recent studies and publications.

In current pedagogical research papers devoted to using educational games for University students are not rare. Different aspects of the problem have been considered by several authors (Akdogan, 2017; El-Shamy, 2001;

Martinson & Chu, 2008; Mubaslat, 2011; Robertson, 2007; Wright, Betteridge & Buckby, 2006). Many researchers also are engaged in the problems of using an interactive whiteboard for educational purposes including its application in the study of foreign languages (Glover & Miller, 2001; Glover, Miller, Averis & Door, 2007; Holubnycha & Shatrava, 2017; Kirbaş, 2018b; Kostikova, 2018; Rivers, 2009; Schmid & Whyte, 2012 etc.). A number of scientists develop other non-traditional methods of teaching (Cohen, 2011; Foreman, 2003; Keser, Uzunboylu & Özdamli, 2011; Kostikova, Viediarnikova, Holubnycha & Miasoiedova, 2019; Miasoiedova, 2016).

However, the issue of using educational games provided with an interactive whiteboard to motivate and make students' progress of non-linguistic specialties at Universities to learn professional English has not been the subject of detailed scientific research.

1.3. The purpose of the research.

So, the purpose of our research is to check the influence of educational games based on using an interactive whiteboard for students' progress in effective teaching professional English to non-linguistic students.

2. Methodology

2.1. The methods of the research.

The purpose of the study required using the following groups of methods:

1) theoretical research methods such as analysis and synthesis of pedagogical experience, different teaching and learning kits related to the English language. They were needed to develop a system of educational games which were applied at English lessons with experimental groups;

2) empirical (diagnostic) methods as the paper describes an experiment. They are observation, questionnaires, discussions and pedagogical experiment itself. The mentioned methods were necessary to study the influence of using educational games provided with an interactive whiteboard in English classes to students' motivation to learn English and, as a result, to the level of students' success in the language;

3) statistical methods which were required to measure the results of the pedagogical experiment.

2.2. Procedure.

The described pedagogical experiment took place in Yaroslav Mudryi National Law University (Ukraine) with experimental groups (180 students) and control groups (365 students). The experiment continued for five years: from 2013 to 2018. In 2013-2014 the questionnaires were developed and investigated, in 2015-2016 the equipment as interactive whiteboards was bought by the university and some teachers were taught to work with the equipment, in 2016-2018 it was checked the influence of educational games with an interactive whiteboard to students' Vocabulary, Reading, and Writing for effective English teaching at non-linguistic faculties.

3. Results

3.1. The essence of the experiment.

According to the results of the questionnaire, which was held at the beginning of the experiment among teachers of the departments of foreign languages # 1, 2, 3 (40 persons) and students (100 students), low level of mastering English is caused by a lack of motivation (50% of teachers; 57% of students) and poor knowledge of linguistics in general including native language (37.5% of teachers; 32% of students).

While interweaving the respondents about the reasons of insufficient knowledge of English we did not formulate them like "a lack of motivation and poor knowledge of linguistics", but meant motivation naming "a lack of interest to the subject (45% – teachers; 44% – students) and of necessity in mastering English (5% / 13% – accordingly)". As for insufficient linguistic knowledge, we pointed it as "a lack of knowledge of native language (25% / 8%) and of linguistic skills (12.5% / 24%)". Each respondent had to determine only one main reason of poor mastering English.

On the one hand, the choice of such reasons was somewhere predictable. Both students and teachers' respondents believe the mentioned reasons to be major. And they are unanimous as for lack of interest to the subject. On the other hand, the results demonstrate significant divergences in assessments and points of students and teachers' view as for a lack of necessity in mastering English, knowledge of native language and linguistic skills. They differ in two or three times. Perhaps, the explanation of the situation is contained in different approaches of the respondents (students and teachers) to the understanding the mentioned positions.

It seems also important to single out another significant reason that can exist: a lack of class hours for foreign languages that are planned in training programme by University management. However, not a big amount of respondents paid attention to the problem. Analysis of questionnaire results shows that the respondents-teachers considered the situation to be more important (12.5%). Statistical analysis of the reasons is represented in Table 1.

Table 1. Respondents' Distributions of Poor Knowledge Reasons of the Foreign Language

A Reason of poor English knowledge	Students		Teachers	
	#	%	#	%
Lack of time for English at home	6	6	0	0
Lack of hours for English in programme	4	4	5	12.5
Lack of subject interest	44	44	18	45
Lack of necessity in mastering English	13	13	2	5
Lack of knowledge of a native language	8	8	10	25
Lack of linguistic skills	24	24	5	12.5

Thus, the survey results, namely the overwhelming majority of respondents who underlined a interest lack to the subject made us to hold another questionnaire (among the same respondents) to find out the ways of strengthening the motivation of non-linguistic students to active the work at the foreign language classes.

So, there was proposed to choose the means that could do English lessons more interesting for students, consequently, to high up their motivation and as a result to advance skills in the foreign language. The respondents had to choose only one position. Statistical analysis of the motivation means is represented in Table 2.

Table 2. Respondents' Distributions of the Ways of Strengthening Motivation to Learning English

Means of motivation to learn English	Students		Teachers	
	#	%	#	%
Using more profession oriented materials	24	24	1	2.5

Using gaming technologies	16	16	5	12.5
Using interactive technologies	20	20	10	25
Using non-standard elements	12	12	5	12.5
Using modern methods more	15	15	11	27.5
Using communicative methods more	13	13	8	20

As the table study shows, neither the students nor the teachers paid particular attention to any certain way of strengthening the motivation for learning English. However, professional orientation of the material at English lessons is of the greatest interest to the students – 24% of the respondents-students. 20% suppose that their English classes could be more motivating for them if their teachers used interactive technologies.

The rest of the motivation means got nearly the same quantity of points among the students. As for the respondents-teachers, they are not so excited by additional using profession oriented materials at their lessons. Only 2.5% of respondents liked the idea. They are more inclined to apply modern methods of teaching in order to increase motivation of their students – 27.5%. 25% of the respondents-teachers consider that interactive technologies could help to reach the purpose. 20% believe in the power of communicative methods. The rest two positions (using gaming technologies and using non-standard elements) got equal percentage of the teachers' trust – 12.5%.

Thus, after analyzing the results, the idea of the basic period of the pedagogical experiment in 2016-2018 appeared. There was made a decision to unite the pointed means of students' motivation to learn English. So, it was determined to try to apply educational games as non-standard elements, which would be provided with an interactive whiteboard that would give possibility to use interactive technologies and modern methods widely. As for profession oriented materials, it is natural that it is of first-priority in non-linguistic students. But in the framework of the experiment it was decided to pay the particular attention to that aspect as well as communicative methods.

In this article we describe only several aspects of the experiment in students' progress in Vocabulary, Reading, and Writing.

The results of the pedagogical experiment in 2016-2018 of students' progress were measured by evaluation of the English level in students' Vocabulary, Reading, and Writing among the students of the experimental groups (180 students) and control ones (365 students).

In 2016-2018 our pedagogical experiment plan to check students' progress suggested: 1) creating equivalent groups (randomization); 2) presence of experimental and control groups; 3) preliminary and final testing and comparison of group results.

To form our sample for the experiment, we adhered to the following requirements (criteria):

1. The content criterion. Our sample corresponded to the content of the hypothesis (students' progress in three aspects: Vocabulary, Reading, Writing influenced by educational games with an interactive whiteboard).

2. Criteria of representativeness. Our sample reflected the general respondents' distributions qualitatively (students' age, gender, learning achievements) and quantitatively. As it is known, in pedagogical researches, a sample of more than 100 respondents is considered representative.

We'd like to note that there is a persistent statement that for correct statistical processing of the results, the sample size in the experimental and control groups should be the same. In fact, groups may not be equal in size, but the differences inside groups (students' age, students' learning achievements etc.) should not be significant. It is clear that the average value in a group (arithmetic average) does not depend on the size of the group, since when calculating it, the sum of the indicators of all the participants in the group is divided by their number.

In our case the size in the experimental and control groups were not the same because of the different number of students entered the university different years, not all university lecture rooms were equipped with interactive whiteboards, not all university teachers were taught and ready to work with the new equipment. That's why the size in the experimental and control groups were not the same.

So, in order to check the influence of educational games based on using an interactive whiteboard to Vocabulary, Reading, Writing skills among the students the basic period of pedagogical experiment was carried out in Yaroslav Mudryi National Law University (Ukraine) with experimental groups (180 students) and control groups (365 students) in 2016/2018. The following features of the groups can be pointed out: 1) the students were about the same age (from 17 to 19 years old); 2) they were the first-year students of non-linguistic faculties; 3) after questionnaires we knew they were motivated to learn professional English.

The indicators for the evaluation were three skills such as Vocabulary, Reading and comprehension of legal texts, and Writing letters (official stile) in both groups. The first two indicators were checked through tests and the last one was checked by writing and correcting essays. The tests

based on Vocabulary, Reading, Writing to check both groups, the tests based on the following criteria: 1) English legal texts composed by the teachers of the mentioned departments i.e., adapted for the students; 2) legal texts that only enclosed a half of previously studied language phenomena, the rest information was authentic. It was done the Preliminary Testing first.

During the experiment the students had several tests at the end of every term. The first and the last ones are taken to evaluate and compare the initial and the final levels of students' English proficiency as for Vocabulary, Reading, and Writing and to measure the results of the pedagogical experiment. The tests, which were proposed for the students, contained the tasks for checking the mentioned skills in Vocabulary, Reading, and Writing. And their results were assessed according to the following levels of English proficiency: Elementary, Pre-Intermediate, Intermediate, Upper Intermediate.

Elementary level means that less than 50% of the assignments for reading and comprehension of the text are done correctly, as for using the language a student is able to make without errors 1 or 2 affirmative sentences and 2 or 3 word combinations using material of a partially adapted text or 2 – 4 sentences and 4 – 5 word combinations of an adapted text, monitoring writing skills indicates his ability to compose (with a considerable amount of lexical mistakes) a short official letter (less than 7 sentences).

Pre-Intermediate level means that the tasks for the first group of skills are completed by 50% to 79%, the results of the assignments for the second group of skills show ability to build without errors 3 or 4 sentences both affirmative and interrogative and 4 or 5 word combinations on the material of partly adapted text or 5 – 6 sentences and 6 – 7 word combinations of adapted text, writing competence is demonstrated by writing an official letters from 7 – 10 sentences with insignificant number of lexical errors.

Intermediate level means that from 80% to 94% of the assignments for reading and comprehension are done well, concerning operating with English vocabulary, a student is able to make 5 – 6 sentences with different word combinations, and 6 – 7 word combinations basing on a partly adapted text or 7 – 8 sentences and 8 – 9 word combinations on the other type of the text, as for the writing abilities they are shown by writing the mentioned letters consisting of 11 – 20 sentences with a small amount of errors.

Upper Intermediate level means 95 – 100% of comprehension of the content of a text and completing tasks without errors or with 1 or 2 ones that can be corrected by a student independently, using the language is good (more than 7 sentences and 8 word combinations using material of a partly

adapted text or more than 9 sentences and 10 word combinations of an adapted text, more than 20 sentences of an official letter (without errors or with two lexical errors) indicate excellent writing skills. The statistical analysis of the results of preliminary testing is represented in Table 3.

Table 3. Respondents' Distributions of the Results of Preliminary Testing

Levels	Experimental groups		Control groups	
	#	%	#	%
Elementary	9	4.72	18	4.80
Pre-Intermediate	7448	41.11	147	40.33
Intermediate	65	36.11	131	35.94
Upper Intermediate	32	18.06	69	18.93

Thus, the results of the table show that at the beginning of the research in experimental and control groups there could be supervised nearly equal students' distribution in levels of English proficiency. The difference does not exceed 1%, namely the maximum difference was 0.78%.

So, during the experiment the methodical use of educational games, which were provided with the help of an interactive whiteboard, was foreseen. There were developed educational games for every lesson with the experimental groups. The students were proposed different kinds of educational games. Every lesson, at least one educational game, based on using an interactive whiteboard, was offered. The only exception was test lessons where the students had to perform tests. Such a test took place twice a term and was aimed at checking the changes of the language proficiency and our assumption of the positive impact of the inclusion of non-standard elements at English lessons with students of non-linguistic faculties.

There were no educational games with an interactive whiteboard in the control groups. The control groups were taught without application of the authors' technique.

In both groups (experimental and control ones) the working program of the discipline "Legal foreign language" the following thematic blocks were included: "Legal systems of the world", "Legal profession", "Judiciary", "Prosecutor's office", "Investigator's activity", "Defence lawyer's activity", "Notarial system", "Human Rights and International Law", "European Union".

Educational games, designed with the use of an interactive whiteboard, were developed in the experimental group. The application of the named device gave possibility, on the one hand, to increase students'

interest and motivation to the subject and, on the other hand, to reduce additional complexity of the material connected with professional topics, which are new for students of initial courses, as the features of an interactive whiteboard allow to provide students with a considerable amount of visual and verbal supports.

3.2. The proposals.

As examples of educational games used with an interactive whiteboard, which were developed for experimental groups, we propose many games such as Colour coding, Hot seat, Writing race, Noughts and crosses (Tic-tac-tou), Hangman, Mind map, Picture dictation, Jeopardy, Pick a card drawing sentence challenge, Battleship, 20 questions, Board race, Spelling bee, Who am I?, Two truths and a lie, Don't laugh, don't smile, Simon says, What's my problem? etc.

In this article we describe as an example the following game as Noughts and crosses (Tic-tac-tou). The goals of game *Noughts and crosses (Tic-tac-tou)* may be different. They depend on the form of the game presentation. In the experience there were both easier variants of semi-communicative nature which were aimed at developing lexical and grammatical skills (so, new words on the topics and certain grammatical structures were trained) and more complicated communicative variants. As it is known, that educational games have three stages (preparatory, main and final) here they are.

The preparatory stage. The students are divided into two teams: a team of crosses and a team of noughts. Everybody is very familiar with the game rules. But the proposed variants differ a little, so the task should be explained in details.

For a semi-communicative variant. As usual the final purpose is to put three similar signs in a line. In order to place your sign you need to give the right answer to the question, which will be asked. You will do it in turn, but if your answer is wrong, you lose your possibility to put your sign and your opponents get a chance to answer your question. In the case of a right answer they can put their sign. Keep in mind that it means they will get opportunity to put their sign twice if they give right answer to their question, as all the questions are asked in turn: to crosses, to noughts and so on. On an interactive whiteboard students can see the following playing field (see figure 1):

Figure 1. A Playing Field

The main stage. A teacher presents the questions, addressing them in turn to one team then another. Here is the list of such questions on the topic “Judiciary”: 1) Who represents state prosecution in court? 2) Who questions witnesses about circumstances of the criminal case? 3) Who gives testimony under oath, which is used to establish some fact or set of facts of the crime? 4) Who collects evidence and submits it in the trial? 5) Who defends his/her client in a court? 6) Who gives a verdict? 7) Who makes a judicial decision according to the law? 8) Who swears to tell the truth in the trial? 9) Who admits his/her guilt?

The teams answer the questions and put their signs in a playing field on the interactive whiteboard when they give the right answer (see figure 2).

Figure 2. The Game in Progress

There may be other variants. For example, the questions can be replaced by definitions of some legal notions, which students need to guess or legal terms on certain topic can be placed in the cellules and students have to match them with their pictures put outside a playing field.

The final stage. The winner is determined and the results are analyzed.

For communicative variant legal terms (for example, jury/ judge/ court/ prosecutor/ evidence/ defendant/ witness/ lawyer/ verdict) can be on a playing field. The task will be to give their definitions (see figure 3).

Figure 3. The Playing Field

In this case the students will be able to put their sign only in that cellule where is a term instead of it, if they give a correct definition (see figure 4).

Figure 4. The Game in Progress

Another variant was connected with different kinds of crimes (smuggling/ swindling/ shoplifting/ kidnapping/ embezzlement/ manslaughter/ robbery/ burglary/ arson) which were presented on the playing field of an interactive whiteboard, the students were asked to give examples of appropriate crimes.

3.3. The analysis of the results.

The final test, which was proposed to both the experimental (180 students) and the control groups (365 students) to check the changes in skills in Vocabulary, Reading, and Writing that were examined at the preliminary testing, showed the results which approved the efficiency of using educational games provided with an interactive whiteboard at English lessons. Comparative statistics of the results of preliminary and final tests is represented in Table 4.

Table 4. Respondents' Distributions of the Results of Preliminary and Final Tests

Levels	Experimental groups				Control groups			
	#		%		#		%	
	Befor	Afte	Befor	Afte	Befor	Afte	Befor	Afte
	e	r	e	r	e	r	e	r
Elementary	9	1	4.72	0.56	18	16	4.80	4.52
Pre- Intermed.	74	763	41.11	40.5 6	147	138	40.33	37.7 2
Intermediat e	65	70	36.11	39.1 6	131	138	35.94	37.8 7
Upper Inter.	32	36	18.06	19.7 2	69	73	18.93	19.8 9

So, in the experimental groups the analysis of the table shows that, firstly, all indicators have changed for the better. The biggest difference has taken place in Elementary level of the experimental groups. Secondly, the number of students of the first and the second levels (Elementary and Pre-Intermediate) has decreased while of the third and the fourth (Intermediate and Upper Intermediate) has increased. Thirdly, more significant changes have taken where the number of students with Elementary level has decreased on 4.16%, Pre-Intermediate – 0.55% while it has increased on 3.05% in Intermediate level and on 1.66% in Upper Intermediate level.

The indicators in the control groups have changed less significantly (0.27%, 2.61%, 1.93%, 0.96%). Apparently the achieved results are due to the fact that proposed authors' technique of teaching could motivate non-linguistic students to be active at English lessons and to make progress.

Thus, the pedagogical experiment has proved that using educational games with an interactive whiteboard at English lessons improves knowledge of English in Vocabulary, Reading, and Writing of non-linguistic students really. So, this technique may be useful for teaching professional English.

Thus, the average progress in the experimental groups allow us to claim that the difference in students' progress is significant, which proves the statistical importance of the results obtained. To our mind, such results are connected precisely with educational games with the interactive whiteboards that encouraged students to learn professional English with great interest and motivation, the visualization of interactive whiteboards influences on students' progress very much, it improves their Vocabulary, Reading, and Writing, and educational games with the interactive whiteboards enlarged real-life interaction at professional English lessons.

4. Discussion

In determining the need for the rapid implementation of the best methodology ideas and technologies, the demand for using non-standard elements at English lessons is increasing. The implementation of different educational games at English lessons is shown in different researches. They are developing vocabulary in game activities (Akdogan, 2017); training games (El-Shamy, 2001); game-based learning (Martinson & Chu, 2008), high school students' game-playing characteristics (Keser, Özdamli, Bicen & Demirok, 2010). It should be noted that using educational games at English lessons experienced significant dynamics during development from simple games (Kostikova, 2018) to complex games with an interactive whiteboard (Kirbaş, 2018 a). Obviously, this way has allowed developing the motivation and interest at English lessons increasing the level of students' foreign language proficiency.

Some articles analyze the advantages of using an interactive whiteboard for educational purposes for foreign languages (Glover & Miller, 2001; Holubnycha & Shatrava, 2017; Schmid & Whyte, 2012). Unlike the other published experimental results as 'multilevel modelling showed positive gains in literacy' (Lewin, Somekh & Steadman, 2008: 291); 'a new taxonomy of features of ICT, IWBs involving two levels: those intrinsic to digital media and devices and those constructed by hardware designers, software developers and teachers preparing resources for learning' (Kennewell & Beauchamp, 2007: 227); the data we obtained about the assessing the effectiveness of educational games with an interactive whiteboard is suggested to the following conclusions. Nevertheless, some our results confirmed the practical data from another experimental works (Kirbaş, 2018 a; Kirbaş, 2018 b; Painter, Whiting, Wolters & Park, 2005).

So, systematic usage of educational games with an interactive whiteboard at English lessons with students during 2 years was crucial for

this period of time in the context of development their basic Vocabulary, Reading, and Writing skills in English and, consequently, confirmed the influence of educational games based on using an interactive whiteboard for effective English teaching to non-linguistic students for improving English proficiency. The research of the influence of educational games with an interactive whiteboard use at English lessons with students allowed us to determine and compare the rate of development in Vocabulary, Reading, and Writing skills in English.

5. Conclusions

5.1. Final conclusions

Thus, firstly, specially developed educational games provided with an interactive whiteboard really support increasing the level of students' foreign language proficiency; secondly, the result contrast of the preliminary and final tests confirmed statistically the efficiency of the authors' technique of using educational games with an interactive whiteboard at professional English lessons.

The use of non-standard elements, namely educational games in teaching English at non-linguistic faculties in a University can be a reserve for improving the quality and efficiency of teaching English.

5.2. Perspectives

The results of the experiment can effectively reflect the perspective of research of other forms of non-standard elements in teaching foreign languages in various educational establishments. Since the popularity of an interactive whiteboard is rapidly growing, its conjunction with different teaching techniques can be investigated as well.

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