

Integrative Use of “Techno-R” Remedial Technology and Gaming Technology in Teaching Foreign Language Listening¹

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Abstract

The article discusses the integrative use of Tehno-R educational and gaming technology. The authors presented the Techno-R technology for teaching foreign languages, which was subjected to experimental verification and showed an effective result in the formation of linguistic and speech competencies. Experimental studies continue currently and a search is underway for the application of this technology in combination with other technologies, in particular, with gaming computer technologies. The authors developed a methodology for including the game in the process of Techno-R technology and conducted experimental training on Ecology with third-year students of the Institute of Philology and Intercultural Communication of Kazan Federal University using the game - "Luc et son examen d'écologie", developed by a co-author of this article. Due to the fact that the experiential training was aimed at the formation of speech competence in the field of listening, the game was developed in accordance with the methodology of the formation of the ability to aurally perceive foreign language. In particular, the developed game included exercises to understand audio texts reflecting various situations of communication on the topic of "Ecology" on the issues of "Natural Disasters", "Municipal Policy "Clean City", "Measures to Combat Urban Pollution". The results of experimental training showed not only a higher quality of the formed competencies but also a significant increase in educational motivation. The results obtained during experimental training are the basis for continuing scientific research at the level of experiments using mathematical statistics methods to determine the validity of empirically obtained data.

Keywords: Technology; Methodology; Foreign Languages; Educational Computer (Mobile) Game.

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1. Introduction

In the modern world, the educational space is marked by the search for new ways of teaching foreign languages against the background of a huge flow of media information. Most of the research in this area is related to the computerization of the educational process, although the question of the quality of education was posed by scientists in a broader aspect (Antonova et al., 2016).

Today, in the era of informatization, characterized by the intensive use of information technologies in all areas of society, including the education system, teaching foreign languages without the use of multimedia teaching tools is unimaginable since multimedia information transfer has great potential in terms of developing skills and abilities through its simultaneous effect on several channels of perception of information. In addition, opening up fundamentally new opportunities for teachers of foreign languages in organizing the educational process, they can contribute to the development of students' communicative competence at a new, higher quality level.

In particular, we can talk about the use of the computer or mobile gaming applications in foreign language classes that are designed not to replace traditional teaching materials but to effectively complement the process of assimilation, consolidation, practical application and control of the knowledge, skills, and abilities that make up the communicative competencies.

Currently, we have the developed and known information and communication technology of Web-quest, podcasting technology, TED video conferences, and video blogs, game technology, evaluation technology. We can argue that none of the technologies is universal, only targeted application related to goal setting can be effective. Integrative application of technologies deserves special attention. We made an attempt to integrate Techno-R and gaming technology in an integrated manner.

We shall briefly outline the essence of our corrective technology - "Techno-R". The first part of the abbreviation "Techno" means "technology", the second part of "P" is the result. "Techno-R" is intended for the correction of speech skills and abilities that are part of the communicative competence. The technology consists of eight blocks. Four blocks relate to language competence - vocabulary, grammar, phonetics, spelling; the second four blocks relate to speech competence - speaking (expression orale), listening (compréhension orale), reading (compréhension écrite), and writing (expression écrite). Our study was conducted on the example of teaching the French language. A systematic analysis of students' mistakes in learning the French language allowed us to find weak points in learning. We found that the weakest point is the indicative basis of the speech actions of the trainees. They do not see the commonality of the educational tasks assigned to them, they doubt the choice of the correct answer, they do not understand the nature of the errors. The theoretical platform of the Techno-R technology is the theory of transfer, the theory of

internalization of mental actions by P. Ia. Halperin, the theory of methods of cognitive and practical activity of the Kazan didactic school (Vasilyeva, 2017). The theory of transfer helps us find didactic ways leading to successful learning. The theory by Halperin (the third type of teaching) is based on generalizations that allow transferring knowledge, skills, and abilities to the solution of new educational problems. The third part of the methodological basis of Techno-R is represented by three levels of cognitive-speech independence of students (copying, reproductive-creative, and constructive-creative). The methodological basis of Techno-R finds its expression in the operational aspect and is presented in the following stages:

- statement of the educational problem (teacher);
- study of the indicative basis of speech actions (teacher and student);
- training in completing a task (for students under the guidance of a teacher);
- control tasks (student);
- determination of the level of formed competence (student and teacher).

We conducted experimental studies and obtained statistical results of experimentally obtained data on spelling, grammar, reading technique, speaking at school and in a university using Student's t-test. In all experiments, the T-criterion showed a value > 2 , which indicates the effectiveness of the developed technology (Mamaeva et al., 2017; Vassilieva & Kuzmina, 2017; Kuzmina Elena et al., 2018; Shemchurenko et al., 2017).

Continuing the search for effective ways of mastering the communicative competence of students, we are trying to incorporate gaming technology into the Techno-R structure by the example of the formation of the French language and listening skills.

Since ancient times, the game as a special type of human activity has been distinguished by its versatility and multifunctionality.

Despite the fact that the “entertaining” orientation of the game is rightfully considered to be the main one, this type of activity can be focused on the implementation of other functions: communicative, socializing, therapeutic, and the function of self-fulfillment (Selevko, 1998).

Pedagogical science considers the phenomenon of the game as a way of organizing upbringing and training, as a component of pedagogical culture, studies the forms and methods of optimizing the gaming activity of the modern generation (Mikhailenko, 2011).

The main difference between an educational game and a game, in general, is the presence of a clearly defined pedagogical task for its participants, and the entire

game process is aimed at acquiring or improving knowledge, skills. Thus, within the framework of the educational game, a new “serious” aspect of activity appears, along with the traditional “entertaining” aspect in the framework of integrative teaching of lexical and listening skills in the process of teaching a foreign language (Schmoll, 2016).

Computer (mobile) games in learning help to increase the activity and educational motivation of students (Whitton, 2012). Also, during the game process and the student’s active interaction with the digital environment, presented in the form of a computer or mobile game application, the students develop skills in working with information technologies.

In our opinion, the most effective educational gaming applications are small "point-and-click" quests, divided into subtopics (semantic or functional) depending on the tasks assigned, and united by a common plot and main game characters.

Such "quests" can cover individual blocks of the curriculum or the entire program, providing this didactic tool with such characteristics as integrity, structure, and consistency.

An educational "quest" is a complex system of the interconnected game and learning elements. We have developed an educational game called "Luc et son examen d’écologie", which is included in "Techno-R".

2. Methods

As the main research method, we conducted experimental training at the Institute of Philology and Intercultural Communication of Kazan Federal University in the third-year students studying French. Before presenting the results of the training, we will characterize our game “Luc et son examen d’écologie”. The composition of the game includes the following components developed by us:

2.1 *Game Characters*

2.1.1 *The main character*

Luc is a university student who has problems with his studies, in particular with the subject “Ecology”. He is lazy but kind, honest, and decent. Before doing anything, he needs someone to push him to action, but if he takes on something, he does it well.

Luc is a game character, that is, the student is invited to complete the game, trying on the role of this character.

2.1.2 *Minor characters*

- *Harry* is Luc's classmate and friend. A native of England, however, he is distinguished by his absent-mindedness, unusual for a

representative of his nation. He appreciates friendship with Luc and is trying in every possible way to help him with his problems with studies.

- In the game, Harry is a guide character, that is, most of the game he directs the player to complete tasks.
- *Jacques* is Luc's classmate. Silent, restrained but very responsibly deals with the various tasks, which makes both teachers at the university and his classmates trust him with the most important tasks.

In the game, Jacques meets the player as part of the second training exercise, directing the player's actions.

2.2 The Plot

The plot is based on a small fictional story that happened to Luc during his study at the university. One day, returning to the hostel after school and dreaming of how he would relax in the evening playing his favorite game console, Luc meets his friend Harry, who changes all his dreams for the evening. From the conversation, Luc learns that Harry and his classmates are aware of Luc's problems with Ecology, the threat of his dismissal, and the upcoming exam. In this regard, and knowing that Luc will not be preparing for the exam, Harry and classmates decide to help Luc by taking the game controller and recharging USB cable for a while, agreeing to return them only if Luc does homework assignments in "Ecology". Having found out all this, Luc has no choice but to agree to fulfill the requirements of Harry and classmates, and at the same time to properly prepare for the exam in Ecology.

2.3 Dialogues

In the game, dialogues are mainly represented by conversations with minor characters, the main task of which is to guide the player along the path of the game, reveal the plot and set goals and tasks for the player, as well as provide tips for completing tasks inherent in the "quests". All dialogs in the game are compiled in French and voiced by one of the authors of this study.

2.4 Graphic Elements and Audio Accompaniment

2.4.1 Visual design

All the components of the visual design of the game, including background images, in-game items and characters, animations and interface elements are made by an independent illustrator in a cartoon style.

2.4.2 Sound

All sound in the game consists of:

- background music from CCMixer (<http://ccmixter.org>), used under the Creative Commons Attribution Noncommercial license, which grants the right to free use of the work for non-commercial purposes and provided that the author is mentioned in credits;
- sounds, including sounds of walking, opening/closing doors, sounds of completing a task, etc., from Free Music Archive (<http://freemusicarchive.org>) and Freesound (<https://freesound.org>) under the same Creative Commons Attribution Noncommercial license as mentioned above;
- audio recordings of the voice-over of dialogs and various replicas of characters in French recorded by one of the authors of this study.

2.5 Educational Exercises Aimed at Developing Vocabulary and Listening Skill

The following educational language exercises are integrated into the game:

- An exercise aimed at developing lexical skills, searching for correspondences between the terms on the topic "ecology" and their definitions. This exercise was developed by us and implemented in the game through an environmental project that was set as homework for Luc and Harry. This project is to create a special board to contain 9 different terms on the topic of "ecology". Definitions are already written on the board, and for each of them, the player needs to substitute a card with the corresponding term. According to the plot of the game, Harry lost all the cards, and before starting the exercise, the player needs to first find all the cards as part of exploring the game world.
- An exercise aimed at developing the listening ability in the form of listening to an audio text and performing a test for a general, detailed, and critical understanding of the subject. This exercise is taken from the website of the international French radio - RFI, the category of educational materials for learning French (<https://savoirs.rfi.fr/fr>). All materials related to this exercise, including audio recording, test task, and transcription, are available on the website and are intended for free use for educational purposes. In the game, this exercise is presented in the form of Luc listening to an audio recording on a tape recorder and performing a test task using a special in-game object - a paper sheet with tasks and lines for answers.

2.6 Tasks Typical of “Quests”

Such tasks in our game include the task of searching for objects (cards with terms for completing the first training exercise), as well as the task of fulfilling a key mission of the game (receiving a game controller and a USB cable after performing the training exercises described above in paragraph 5).

2.7 Means of Control and Evaluation

An automated tool integrated into the game at the level of program code for calculating the correct and incorrect answers made by students during the in-game exercises, as well as to determine the difficulties found by students in their implementation.

Experienced training was conducted in vivo. Prior to the experimental training at the university, we conducted a level B2 test to understand the audio text on the topic “Ecology”. We have chosen criteria for evaluating the level of understanding of the audio text:

- general comprehension;
- detailed comprehension;
- critical comprehension.

We got the following results: All students coped with a general understanding of the text, a detailed understanding of the text caused some difficulties, not all students coped with a critical understanding of the text. The general results are as follows:

Total students	A general comprehension of the audio text	A detailed comprehension of the audio text	Critical comprehension of the audio text
15	15	8	6

Experimental learning implied the use of a Techno-R-integrated game.

- The students had to aurally perceive the texts on the topic “Ecology” and express their own opinion on the content of the texts.
- The indicative framework included lexical blocks presented in speech samples that can be used in understanding speech in various situations on the topic "Ecology": Natural Disasters, Municipal Policy "Clean City", Measures to Combat Urban Pollution. The indicative basis of speech actions was worked out with students before the start of the game.

- The training was organized as a game through the use of a training computer (mobile) game application, namely, our game "Luc et son examen d'écologie".
- Control was carried out in the form of listening activities.

It is noteworthy that, as a control, students were offered to understand the same audio text that was used as the test prior to experimental training.

3. Results and Discussion

Test results after the experimental learning:

Total students	A general comprehension of the audio text	A detailed comprehension of the audio text	Critical comprehension of the audio text
15	15	14	13

Our experimental learning based on the integrative application of Techno-R and gaming technology showed a positive trend in understanding the audio text in French. All students cope with a common comprehension of an audio text, while the results on a detailed comprehension of audio text have almost doubled. As for the level of critical comprehension of the text, the results have improved more than twice. We believe that improving listening of French speech occurred due to a clear indicative basis of speech actions, game learning, and also as a result of increased interest in doing work in an unconventional form and increasing motivation to learn a foreign language. The motivational aspect of the work was expressed in increased interest in completing the tasks and in the desire of students to achieve the result, that is, to understand the level B2 audio text in French.

4. Summary

As a result of our research on the integrative use of technologies, we can conclude that this approach improves the quality of learning foreign languages, in particular, the level of speech competence of students in the aural perception of a foreign language. As it was shown in the article, we conducted a lot of research on the Techno-R technology in the field of spelling, grammar, vocabulary, which relates to the formation of the language competence of students, and in the field of teaching speaking as a type of speech activity. Experimentally obtained data, subjected to statistical evaluation by Student's t-test, showed a high level of reliability. Our attempt to integrate Techno-R and a training computer (mobile) game in the form of

"quest" in listening has shown encouraging results. Techno-R with the use of computer (mobile) game applications has shown not only a high learning outcome but also increased motivation for learning and the level of knowledge of skills in working with information and computer technologies.

5. Conclusions

1. The integrated use of teaching technologies helps to improve the quality of the formation of the communicative competence of students.
2. A proved effective way is to use educational computer (mobile) game applications ("quests") as part of corrective technology.

The authors of this article plan to conduct experimental studies on the above approach on the basis of the university topic of the formation of students' speech competence using methods of mathematical statistics, in particular, “Student t-test” to determine the validity of empirically obtained data.

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