



## Corrective Technology "Techno-R" in the Formation of Students' Competence in English as a Foreign Language

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### Abstract

Teaching first-year students lexical and grammatical English skills with an emphasis on "pedagogical education," the article details an experimental study of the remedial technology "Techno-R" developed at the Department of Theory and Practice of Teaching Foreign Languages at Kazan Federal University. A concise synopsis is provided by the authors regarding the scientific justification, content, and methodology underlying the "Techno-R" technology. The article provides a detailed account of the experiment aimed at enhancing language competence through the development, content, and outcomes of grammatical and lexical skills. The article demonstrates the application of a generalized approach to learning tasks at the indicative basis for the speech actions stage, outlining the content of the training and control phases of the technology. The mathematical statistics technique known as the "Student's t criterion" was utilized to assess the dependability of the experimental outcomes. Comparing findings prior to and subsequent to the implementation of the "Techno-R" technology, the computation was performed in accordance with the predetermined parameters. A digital evaluation of the proficiency in vocabulary and grammar comprised the parameters. The article demonstrates the efficacy of the "Techno-R" technology in enhancing the language proficiency of students learning a foreign language through the presentation of the calculation formula and the result  $T > 2$ . This indicates that the empirically obtained data are reliable.

**Keywords:** Corrective Technology; Techno-R; English as a Foreign Language.

### 1. Introduction

A competency-based approach to learning is indicated in the modern educational space, where the student's personality occupies a central place, being the subject of the educational process. There are known information, design, modular, gaming, and evaluation technologies that contribute to the educational process (Dominique & Porshneva, 2015), but none are universal. Despite the numerous educational technologies proposed for use in the foreign language educational process, the question remains: "Why are we not having the expected effect?" Students struggle to absorb educational material. To address this inconsistency, we are developing a corrective technology called "Techno-R," where "Techno" stands for "technology" and "R" stands for "result." The following are the main features of this technology. The corrective technology "Techno-R" is based on three fundamental theories: the theory of the gradual formation of mental actions (Galperin, 2003), the theory of common elements (Thorndike et al.), and the Kazan didactic school's theories of cognitive and practical activity. The technological, methodological foundation enabled us to formulate the following principles: 1. The generalizability principle of educational tasks because generalizability is the mechanism for transferring knowledge, skills, and abilities. 2. The principle of building students' speech independence step by step, from copying to reproductive-creative and constructive-creative independence. The Techno-R technology structure includes both thematic and procedural aspects. Thematically, there are eight blocks designed to adjust the skills and abilities that comprise communicative competence. The technology's subject matter is focused on state programs in foreign languages in accordance with the new generation standard.

The structure of the Techno-R technology is represented in the operational plan by the following stages: statement of the educational task (teacher); study of the indicative basis of speech action (mutual activity of the teacher and the trainees); task training (trainees under the supervision of the teacher); independent performance of a new

educational task (statement, test, control work, etc. according to adequate competence); determination of the level of competence (language, speech or socio-cultural depending on the task) by the trainees themselves and the teacher.

An important question is when and under what circumstances the Techno-R technology should be used. Notably, the primary goal of this technology is to improve the quality of education and language development of individuals, assisting students in achieving high-quality results in the field of foreign language proficiency (Tikhonova, 2021). Our research is conducted in accordance with the current content of foreign language education. If there is a pedagogical fact of a low-quality level of communicative competence (or its components) in secondary schools, language universities, and non-linguistic universities on the subject of "Foreign language," we recommend using the Techno-R technology. Furthermore, we recommend conducting classes based on the Techno-R technology in the disciplines of language universities, "Correctional Grammar" and "Correctional Phonetics," to improve the quality of the competencies being formed (Galeeva, 2019).

## 2. Literature Review

In the modern educational landscape, secondary and tertiary education are supported by an immense variety of educational technologies. The philosophical underpinnings of the dominant concept of educational material organizational forms of learning diverge from technologies. Technologies for a specific subset of students vary in terms of content and function (Yarmakeev et al., 2016; Fahrutdinova et al., 2014). The innovative team at Kazan (Volga) State University is currently engaged in the development of the educational technology known as "Techno-R." This technology serves as a remedial tool for students' language communicative competence. The benefits and drawbacks of established technologies are examined briefly before elaborating on their essence. The objective of traditional technology, which is also referred to as reproductive technology, is the dissemination of expertise, skills, and knowledge. The educational paradigm of listening, memorization, and reproduction forms the foundation of this technology. This technological advancement is both cost-effective and facilitates students' comprehension of intricate academic content pertaining to the natural-mathematical and humanitarian cycles, which emphasize the paramount importance of knowledge mastery. Students' intellectual capacities are not significantly enhanced for individualization and innovative progress, which are among the drawbacks of this technology (Kessler, 2018).

The developmental teaching technology appeared against the background of traditional technology. Representatives of developmental teaching advocate teaching at an elevated level of complexity because, in their opinion, it effectively reveals the child's spiritual strengths. The concept of developmental teaching is popular in Russia; however, the demands of teaching all students at a rapid pace and with a high level of complexity are not feasible for all of them. The gradual development of mental actions technology (Galperin, 2003) takes on a unique role and application. According to the technology, knowledge, skills, and abilities cannot be acquired and stored outside of the activity. The author's thoughts on the formation of an indicative basis for action and the various types of learning are particularly useful. We disagree with some authors' contention that the formation of stereotyped and motor students' actions inhibits the development of their creative potential. Gaining the foundation of phonetic, lexical, grammar, and spelling skills in the field of foreign language mastery, on the other hand, opens up endless possibilities for the development of the student's creative potential at the level of speech activity skills. As a methodological foundation for our research, we used Galperin's (2003) theory of the third type of learning.

## 3. Methodology

As demonstrated above, the "Techno-R" technology is applicable to every facet of communicative competence. We are currently conducting further research to determine its efficacy in facilitating the development of foreign language proficiency. Regarding the subject "Profession," this article details a pedagogical experiment conducted with first-year students at the Institute of Philology and Intercultural Communication of Kazan Federal University on the blocks "Vocabulary" and "Grammar." We have assembled twenty individuals as an experimental group. The subjects' sample size was determined using the following formula:

$$n = \frac{t^2 \sigma^2}{\delta^2}$$

where  $t$  represents the confidence coefficient,  $\sigma$  denotes mean-square deviation, and  $\delta$  is the specified accuracy degree.

Control sections were conducted both prior to and subsequent to the Techno-R technology training. It is well known that the quality of skills, in this case, speaking and writing, can be objectively evaluated as components of speech skills. Before the "Techno-R" technology training segment, participants were required to discuss the occupations of family members, friends, and acquaintances. Students made errors in their oral and written statements when denoting their professions with lexical units of the feminine and masculine genders in the control section prior to the training. Additionally, errors were made regarding the application of articles. As per the procedural aspect of the Techno-R technology, the instructional objective was to acquire the skill of accurately employing the names of professions.

A statement has been requested regarding the occupations of family members and neighbors. Students were asked to talk about the professions of friends and acquaintances at the stage of self-fulfillment of the educational task, assessing their level of competence. At the level of language competence assessment, students assessed their own lexical and grammatical material on the topic "Profession" and considered the teacher's comments. In both the control and pre-Techno-R sections, quantitative indicators of speech quality were recorded according to the established parameters: the correct use of profession names with only one gender, the absence or setting of the article before the name of professions, and an approximate volume of utterance of at least 15 phrases. The parameters were scored in points; for each error within ten, the score was reduced. The use of digital indicators in accordance with the established criteria enabled the use of the mathematical statistics method known as the "Student's t criterion." The calculation was made according to the following formula:

$$t = \frac{M_1 - M_2}{\sqrt{m_1^2 + m_2^2}}$$

where  $M_1$  and  $M_2$  denote compared average values of parameters (a larger average value is taken as  $M_1$ ), and  $m_1$  and  $m_2$  represent their average errors.

As is common knowledge, the difference between two average values is deemed statistically insignificant if the calculated value of  $t$  is less than the second digit. This difference remains significant with a probability of 0.95 if  $t$  is greater than digit 2; the probability increases to 0.99 if  $t > 2.6$  and to 0.999 if  $t > 3.3$ . Upon performing calculations on the empirically acquired data, the Student's t-criterion value of 3.7 was obtained.

#### **4. Results**

The findings of the research demonstrate that the Techno-R technology is productive in enhancing the grammatical and lexical proficiency of English-learning students. When statistical analysis is performed on experimentally collected data using the "Student's t criterion," the results' dependability is demonstrated. A comparative analysis of the study's findings regarding the correction of lexical and grammatical skills with the outcomes of prior experiments concerning the correction of speech skills and abilities comprising communicative competence is intriguing. In those experiments, the Student's t criterion values varied from 3.49 to 6.48. Publications in the databases Scopus and Web of Science, as well as in the materials of the international scientific seminar "Modern English and Innovative Technologies of its Teaching," provide evidence for this (2016, 2017, 2018, 2019, 2020, 2022 years). Statistical significance is indicated by comparing the results of the experiment described in this article to the indicators of previous experiments. The importance of placing reliance on the didactic interpretation of Galperin (2003) should be underscored.

The Techno-R technology's strength is theory in the form of a third type of teaching, which provides an indicative basis for activity. The theory of Galperin is organically combined with the theory of the transfer of knowledge, skills, and abilities, the mechanism of which is generalization (2003). It demonstrates the didactic method of mastering educational material in conjunction with the "bright point of consciousness" through the development of grammatical and lexical mechanisms. They are built on exercises that reflect the level-by-level mastery of speech independence. Copying independence is developed through echolalic exercises, reproductive and creative through substitution, transformational, and combination exercises known as conditional speech. Speech exercises without didactic support are used to develop constructive and creative independence. We demonstrate the substantive and procedural aspects of the Techno-R technology in the preceding experiment using scientific theories.

## 5. Discussion

Initially, modular learning technology was perceived as a method for structuring educational content; however, its definition subsequently evolved. The modules encompass not solely the subject matter but also the approach to attaining mastery of the module (methods and levels). Recently, the design has gained significant popularity. These alternatives encompass strategies for effectively putting productive learning into practice, engaging the learner in educational activities, and fostering the growth of the learner's cognitive abilities and requirements. WebQuest is among the most well-known technological applications. An Internet-based project activity is being conducted (Dodge: 2020). Digital Storytelling is an assortment of design technologies that enable students to create a multimedia product known as a digital story. These stories may include text, images, music, and voice guidance (Gorokhova, 2020). Specific technological advancements that aid in the development of students' communicative competence are TED technology and TED Talks. Conferences on a wide range of subjects—science, art, politics, culture, global issues, and more—comprise technology. It is crucial to emphasize that accessing and utilizing information presented at TED conferences requires an adequate level of language proficiency.

The effectiveness of the Techno-R technology has been established based on our experiment on the development of students' foreign language competence. We can now state that successful results on grammar, vocabulary, phonetics of the English language, reading technique, speaking, and writing as types of speech activity have been confirmed by experimental data. The use of Techno-R technology in teaching listening is on the agenda. We note that the "Techno-R" technology does not compete with well-known technologies but rather complements the possibilities for improving educational quality. Technologies can be used during the training and self-fulfillment stages of an educational task, game, project, or evaluation. Currently, research is being conducted on the application of Techno-R technology in the context of educational digitalization.

## 6. Conclusions

The following are the characteristics of "Techno-R" technology in the development of students' language competence: 1. The presence of well-defined educational tasks. 2. Appropriate development of an indicative basis for speech actions. 3. Gradual development of students' speech independence. 4. The presence of a self-assessment stage in the development of language competence increases learning motivation. The final feature of Techno-R technology is the requirement to adhere to its operational structure.

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