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Features of Using Flash Cards as a Means for Developing Students' Verbal Creativity

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Abstract

Development of linguistic diversity, creative ideas in foreign language communication are key areas of international activity supported at the UN level. An important condition for effectiveness of any dialogue is the verbal creativity. Personal preparation for professional creative thinking, for overcoming verbal stereotypes takes place in professionally oriented communication. The authors suggest using interactive resources of flash cards in teaching when developing students' verbal creativity.

Methodology. Flash card learning is based on the Leitner method. Flash cards are also used for speech development (vocabulary, morphology, word formation, syntax, pronunciation), and psychological processes leading to new results (fluency, originality, flexibility). The author's testing includes blocks "Vocabulary", "Morphology", "Word formation", "Syntax", "Pronunciation", "Torrance Tests of Creative Thinking". The experimental study was carried out at Vyatka State University. 60 first-year students of the training program "Psychology" (bachelor degree level) are involved. The Lexilize resource is used to create flash cards.

Results. Students study services for creating flash cards, use them to process new material, memorize and present concepts, word formation in a variety of contexts.

In conclusion the features of the presented version of using flash cards in education are described: combination with other means (mobile applications, simulators, infographics) and traditional forms of information transfer; interdisciplinary connections. The rules are

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formulated, implementation of which ensures effectiveness of using flash cards for development of verbal creativity.

Keywords: creativity, linguistic diversity, linguodidactics, creativity of speech, interactive service, Lexilize.

1. Introduction

The UN General Assembly proclaimed the period from 2022 to 2032 as the International Decade of Indigenous Languages. Firstly, this event is aimed at resource mobilization for their preservation, revival and popularization (UNESCO: [Building peace...](#), 2022). Secondly, the proclamation of the “decade of the languages of the world” is one of the important outcome of UNESCO's work focused on intensification of the international cooperation and encouraging the dialogue of nations. Thirdly, it developed recommendations that regulate the way for countries to contribute to the development of the information environment for a deep analysis of modern problems and trends in development of world languages and for implementation of scientific research in the educational process.

Different international events take place to create new approaches to mastering intercultural communication as part of implementation of these recommendations. A case point is the training on formation of creative and innovative thinking skills was organized by the UNESCO Cluster Office in Almaty for the employees of the Youth Resource Centers (UNESCO. [Almaty](#), 2022). During the training they studied the concepts of creative thinking in the digital world, effective idea-generation techniques and non-standard problem solving using information technologies.

At the same time, creative thinking evaluation was implemented into the Programme for International Student Assessment (PISA) as one of the key components for the first time ([Programme for...](#), 2022) in 2021. A special group in the study comprise “tasks for verbal self-expression”.

One of the areas of work of the teacher-psychologist in the modern educational environment involves development of abilities to find the most accurate and effective speech means for effective communication with a person of any age, intellectual level, material and social status in the shortest possible time. In particular, the methodology for development of creative thinking in teaching should be based on the following principles: activity, individuality, consistency, phasing, cyclicity, psychological comfort, cooperation.

Formation of verbal creativity as “the ability to overcome verbal stereotypes at the final stage of mental synthesis and the breadth of the field of associations” is, according to E.V. Dudorova, S.V. Shumkova, one of the urgent tasks of the higher education system (Dudorova, Shumkova, 2018). Training of a highly qualified specialist in demand on the international labor market implies a focus on education of a graduate who does not only possess a system of special knowledge in academic disciplines, but is also able to transform the surrounding reality (Soboleva et al., 2021).

C. Malik, M. Mahmud, A. Anshari, K. Salija note that in the modern world of computer technology there are memorization programs based on the Leitner method (Malik et al., 2020). The features of new information resources must be taken into account when designing the educational environment based on digital technologies, when realizing the didactic potential of interactive tools.

Thus, there is an objective need for additional study of development of students' verbal creativity in the modern educational environment.

The research hypothesis is that using flash cards when teaching will provide additional conditions for development of students' verbal creativity.

1.2. Purposes and objectives of the study

The purpose of the study is determined by the need to use innovative software tools for development of students' verbal creativity as an important condition for preparation of a highly qualified specialist in demand on the international labor market.

Research objectives:

- to analyze the experience of using flash cards in teaching and foreign language training of future educational psychologists;
- to clarify the essence of the concepts of "flash card", "verbal component of creativity" in the digital educational environment of the university;

- to specify the didactic potential of flash cards for development of skills in demand in the international labor market;
- to describe the procedures and principles for measuring the levels of development of students' verbal creativity;
- to experimentally confirm effectiveness of the proposed educational and project activities for development of students' verbal creativity.

2. Relevance

2.1. Literature review

2.1.1. Analysis of Russian scientific and pedagogical literature

In accordance with the Federal State Educational Standard of Higher Education, as a result of mastering the bachelor's program the graduate should form general (general cultural, universal) and professional competences stated by the bachelor degree program ([Prikaz Minobrnauki Rossii..., 2020](#)). Universal competences are of the over-professional nature and do not depend on the training program. This group includes such competences as the ability: to critically analyze the available information; based on existing rules and restrictions to choose the best ways to solve problems; to productive social and intercultural interaction based on respect and tolerance; to self-management for purposes of personal and professional development.

Thus, one of the urgent tasks of the higher education system is to focus on preparation of graduates who do not only possess a system of special knowledge in academic disciplines, but is also able to create and transform the surrounding reality. A certain amount of knowledge turns out to be an insufficient factor for orientation in a rapidly changing world and success in the professional community. In this regard, B.E. Fishman discusses the reorientation of the process of education and upbringing "from the educated person to the creative person" ([Fishman, 2019](#)).

The skills and abilities listed above assume that the student has an active creative position, non-standard thinking, and a creative behavior. Such a specialist will be more in demand on the international labor market.

In domestic psychology many researchers consider questions of creativity. D.B. Bogoyavlenskaya introduced the concept of creativity as "intellectual activity, the ability to go beyond a given situation" ([Bogoyavlenskaya, 2013](#)). S.L. Rubinstein devoted his experimental work to the study of productive creative thinking. In the research the author considers creativity as creativity, creating something new, original, which, moreover, is included not only in the history of development of the creator, but in the history of development of science, art, etc. ([Rubinstein, 2010](#)).

Creativity as a feature of the person is complex in nature and it is a process and result of the person's development and, in our opinion, can be considered as a universal ability of the person that allows successfully navigating in changing conditions of life, productively and creatively transforming it.

According to N.V. Verkhorubova, the richness of speech and vocabulary is a manifestation of speech creativity ([Verkhorubova, 2014](#)). This ability of the person, according to E. Yu. Zavershneva, is considered as the ability to easily and freely argue, influence people and lead them ([Zavershneva, 2013](#)). T. A. Barysheva proves that development of speech creativity is an important condition for formation of creative, innovative thinking ([Barysheva, 2020](#)).

From the point of view of linguistics, verbal creativity is one of the components of the creativity of the linguistic personality, revealing the ability of the speaker to creatively use ready-made linguistic forms and meanings and update the repertoire in conditions of conscious deviation from the canonical forms of speech.

A.V. Shubin considers the verbal creativity as a form of the human verbal-cognitive activity, individual features of speech and an expression of the person's creative abilities through language and individual logical thinking ([Shubin, Serpionova, 2007](#)). S.A. Mednich says that the verbal creativity is the ability to overcome verbal stereotypes at the final stage of mental synthesis and the breadth of the field of associations ([Mednich, 1969](#)). Thus, the verbal creativity is the ability of the person to creative thinking, manifested in creation of a new original speech (verbal) product in any of its verbal forms (oral, written, prose, poetic, monologue, dialogue, etc.).

I.S. Zlobina et al. note that the practical mastery of a foreign language is one of the requirements for a highly qualified specialist of the new economy ([Zlobina et al., 2020](#)).

N.G. Egoshina proves that development of creativity in various forms is possible at all levels of teaching a foreign language, at all stages of the educational process (Egoshina, 2021). In her work she describes principles of designing a system of exercises, which then are used in English classes with students of the Faculty of Informatics and Computer Engineering. The significance of her work for the ongoing research lies in the fact that the system of exercises she proposes is aimed precisely at development of the figurative and verbal creativity, without using innovative software and due to specially selected speech exercises. N.G. Egoshina on the basis of the experimental data proves that speech (communicative) exercises provide great opportunities for development of the verbal creativity (Egoshina, 2021). According to her conclusions, if training exercises are intended for repeated variable repetition of foreign language grammatical or lexical forms, then the actual speech exercises are for formation and implementation of content in the foreign language form.

L.N. Danilova argues that digital technologies became an integral part of our lives, including such an area as the study of foreign languages (Danilova, 2021). Information technologies and digital tools in teaching foreign languages are becoming more and more significant and widely used in education all over the world, including in Russia. At the same time, digitalization is not the methodological approach, it is able to help implement existing methods and, if necessary, propose new activities within these methods. Modern information, communication and digital technologies make it possible to digitally combine text, graphic and video images, speech and musical accompaniment. Based on digital technologies, powerful innovative means of accumulating, presenting and transferring knowledge, as well as learning tools are being created.

G.R. Ereemeeva and A.R. Baranova put forward and substantiate the assumption that availability of programs and applications for smartphones based on the interval repetition method contributes to the qualitative study of new information by their users (Ereemeeva, Baranova, 2016).

So, we can reasonably conclude that creativity, the creative approach are highly demanded qualities of the modern specialist. They are part of the over-subject competences or the so-called "soft" skills, which are necessary for every professional to be successful. The academic discipline "Foreign language" has a great potential for development of these properties of the student's personality. The use of new technologies when studying at university allows to increase the level of demanded digital skills, communication skills. Additional conditions appear for improving the quality of processing new material, memorizing and presenting concepts, word formation in a variety of contexts.

2.1.2. Analysis of foreign literature

The Universal Declaration on Cultural Diversity, adopted by UNESCO, is aimed not only at protecting endangered languages, but also defines a range of activities that countries/states should implement (UNESCO Universal Declaration..., 2022):

- preservation of the linguistic heritage of mankind, promotion of the dissemination of creative ideas;
- encouragement of linguistic diversity, education of respect for the native language, popularization of the study of several languages from childhood;
- development of linguistic diversity in cyberspace and promotion of universal equal access through global networks to any information that is in the public domain.

R. Barac et al. argue that work in accordance with these areas should be started at the level of preschool education and continued at all stages of education (Barac et al., 2014), including in the practice of university teaching. N. Yemez, K. Dikilitaş conclude that the learning model in the modern multicultural world should involve formation of the creative personality capable of independent creative search for solving professional problems (Yemez, Dikilitaş, 2022).

During the analysis of the literature it was revealed that creativity as a property of the person is complex. It is a process and result of the person's development of individuality and, according to E. Bernabeu-Brotos, C. De-La-Peña, can be considered as a universal ability of the person, which allows to successfully navigate in changing conditions of life, productively and creatively transform it (Bernabeu-Brotos, De-La-Peña, 2021).

H. Wang studies the features of development and improvement of creative thinking in the study of a foreign language, namely the speech process (Wang, 2021). The author considers creative thinking through the unity of its development both in qualitatively-substantial and procedural directions.

L. Ortega-Martin et al. developed and presented the concept of “creativization” as a methodological and theoretical category in the process of learning a foreign language (Ortega-Martín et al., 2021). The concept of “creativization” covers conceptual ideas and basic approaches to enhance creative thinking.

A foreign language is a basic humanitarian subject which is studied at many levels of education, including at the stage of higher education. This, as N. Yemez, K. Dikilitaş substantiate, means that the teacher faces the task of developing students' communicative skills (listening, speaking, reading and writing), language skills (phonetic, lexical, grammatical), and sociocultural awareness (Yemez, Dikilitaş, 2022).

S. Bukantaitė, Z. Sederevičiūtė-Pačiauskienė believe that an important condition for modern education is the creation of a comfortable psychological climate in the classroom (Bukantaitė, Sederevičiūtė-Pačiauskienė, 2021). The educational environment should help students feel confident; contribute to the activation of their desire for creative self-expression. It is necessary to understand that the emotional background is closely related to personal feelings; therefore, the atmosphere prevailing in the classroom in a foreign language can both positively and negatively affect the manifestation of students' initiative.

B. Forgács concludes that modern communication is characterized by a variety of linguistic phenomena, including polymodal units of online communication (Forgács, 2022). These units consist of several components: verbal and non-verbal. According to the author the cases of using metaphors are of particular interest. In Internet communication the metaphor often takes a verbal-graphic form and turns into multimodal memes. In such cases there is a language game, code switching. In the course of the research the scientist tries to find out factors that determine the degree of success of metaphors (i.e., the absence or low level of cognitive dissonance in its perception). In addition, the author tries to determine the role of the multimodal metaphor in modifying the picture of the world of the linguistic personality.

M. Van Dijk et al. prove that creativity in the use of language involves the experience of creating, perceiving and criticizing speech works (Van Dijk et al., 2020). They view language as the human activity. In the course of this activity people communicate and replenish the stock of obsessive associations and spontaneous speech reactions to randomly presented stimuli. Typical inscription in conditions of everyday use is opposed to the “creativity” of the rare and unusual. The authors note that the less probable and plausible a word is in a given context, the more creative the sentence with it is. Consciously included in the speech creatives are presented in a special way: with a playful intonation and a peculiar look thrown at the listeners to make sure how the creative is appreciated.

F. von Reumont, A. Budke suggest using comics to develop creativity (von Reumont, Budke, 2021). They put forward and substantiated the assumption that it is advisable to use the potential of comics widely. According to their conclusions, comics are the basis for formation of the project culture of students. The art of comics is not only used in graphic design and advertising. Comics are effective both as a teaching method and as a method of cognition. A comic is a universal form of presenting information: capacious, figurative. The scientists highlight the prospects for the use of comics in the field of education. On the basis of comics at school it is proposed to introduce lessons in dynamic or plot drawing, mathematical modeling.

Y. Ying, D. Marchelline, G. Wijaya in their study describe development of a new digital didactic tool – flash cards (Ying et al., 2021). They consider a variety of examples: how stickers with foreign translations were used (glued to objects at home); the possibility of presentations or posters in the “*.pdf” format; means for mobile devices. The authors substantiate the assumption that today teachers can and should offer their students such an effective digital tool for memorization and development of creative thinking as flash cards.

C. Malik et al. note that in the modern world of computer technology there are programs for memorization based on the Leitner method (Malik et al., 2020). In this case the software tool uses the indicators “forgetting”, “repetition”; keeps detailed statistics; “shifts” cards from one cell to another. Indeed, today's adolescents have different, in comparison with previous generations of children, possibilities of perception (in particular, in terms of its speed), a different threshold level of development of combinatorial and technical abilities.

It is recommended to use the experience of extracurricular activities (for example, electives, education centers, film studios) to create educational films or flash cards (Lai et al., 2020).

At the same time, both Russian and foreign researchers note that using flash cards in the study of disciplines is most often an element of game learning, but their didactic potential is significantly reduced and lost.

The analysis of the scientific works listed above allows us to identify the problem associated with the need for additional study of development of students' verbal creativity in the digital educational environment. The article presents the study aimed at substantiating effectiveness of using flash cards in teaching students as a means of developing their verbal creativity.

3. Materials and methods

3.1. Theoretical and empirical methods

The following methods were used in the work: theoretical analysis and generalization of literature when reviewing scientific theories on creativity; highlighting the main criteria, conditions and modern means for development of the verbal creativity.

Learning a foreign language using flash cards is based on the Leitner method. The essence of the method is revising foreign words in different time intervals, depending on the result of reproducing the word from memory. The rational management of time intervals makes flash cards a powerful tool for remembering information.

The study used flash cards for various purposes: for board games (Shooter, Tic Tac), for quests (Role Play cards, Black cab), for mobile phones (Quizlet, Anki and Lexilize Flashcards), for modification on the computer (Free Printable Flash Card Maker). For example, Role Play cards are a set of 60 cards for developing speaking skills in English lessons. Each card suggests a situation in which the actors are two students/two groups of people. The method contributes to the establishment of direct links between a particular word and its image; helps to make the lesson more emotional, entertaining.

As the main criteria for assessing formation of the verbal creativity, the following are used: fluency, flexibility, originality.

Working with flash cards is designed taking into account the principles of the system-activity approach to learning: when compiling a set of words the understanding of relationships, principles and algorithms of word formation takes place; attention and memory are activated; imagination develops; skills of systematic control and self-control are formed.

The following empirical methods are used to obtain up-to-date information on effectiveness of using flash cards in teaching as a means of developing students' verbal creativity:

- monitoring the communication of all participants in the interaction (for example, explaining a simple word in one minute);
- analyzing answers in a situation of professional communication (negotiations, employment, conclusion of a contract);
- discussing the results of working with flash cards (how two cards are connected to each other or how the image on the card relates to the word);
- the number of words/phrases used by the student when working with a flash card in the process of studying the material;
- time to memorize new words;
- scope and compliance of the used functionality of services for creating flash cards for development of the verbal creativity, etc.

The experimental study was conducted at Vyatka State University while studying the discipline "Electronic resources in the professional activity" and "Foreign language". 60 first-year students of the training program "Psychology" (bachelor degree level) were involved. The average age of the respondents was 19 (78 % female and 12 % male).

The test was used to assess the input conditions, it included the following blocks "Vocabulary", "Morphology", "Word formation", "Syntax", "Pronunciation", "Torrance Tests of Creative Thinking. Creativity by Torrance is the desire to combine diverse information. The study used the Non-verbal tasks (Figural).

The scoring procedure is described in detail in the part "Stages of the research".

As a result of the initial diagnosis each student scored from 30 to 174 points. To determine the level of formation of the verbal creativity (according to the sum of all 6 blocks), the levels "bad" (from 30 to 49 points (inclusive)), "below the norm" (from 50 to 89 points (inclusive)), "norm"

(from 90 to 149 points (inclusive)), "above the norm" (from 150 to 173 points (inclusive)), "excellent" (more than 174 points).

Auxiliary methods of computer data processing are also used: design in the form of tables, diagrams, graphs, presentations and "*.pdf" files.

When characterizing the relationships of the features under consideration, nonparametric statistical criteria are used, in particular, the Pearson's chi-square test – χ^2 .

3.2. The base of the research

The main purpose of the experiment was to test effectiveness of using flash cards for development of students' verbal creativity. At the preparatory stage of the experiment the teacher analyzed the modern achievements of linguodidactics regarding the potential of digital services, interactive learning tools.

60 first-year students of the training program "Psychology" (bachelor degree level) were involved. The average age of the respondents was 19 (78 % female and 12 % male).

The students used Lexilize Flashcards (<https://lexilize.com/ru/>) as a computer program. But they were free in their choice and could use another digital service.

The tools of this service allow to support a special organization of the learning process in the digital environment of the university. Its essence is expressed in a combination of creative pedagogical influence and a set of optimal pedagogical conditions, which should be based on integration and interpenetration of modern achievements in pedagogy and psychology.

With the help of the results of the entrance test it was possible to collect the required initial data on students. The sample was not random. The same teacher gave practical classes to all students to comply with the rules of probabilistic selection. This teacher also formulated the systems of educational tasks, directed information interaction when working with flash cards.

Work with digital services for creating flash cards was carried out in the same classrooms, using the same equipment and software. The materials for the test were developed by the authors in accordance with the current standard of higher education of the training program.

3.3. Stages of the research

The study was carried out in three stages.

At the preparatory stage of the experiment the teacher analyzed the modern achievements of linguodidactics regarding the potential of digital services, interactive learning tools. It was also determined that development of creativity in language learning involves preparing the individual for creative thinking. It was decided to use flash cards as a means to provide additional conditions for development of the verbal creativity. The cards can be used both in the classroom, and online, and in individual training.

At the preparatory stage of the experiment various digital services for creating own flash cards were also considered and analyzed: the online generator (<https://kids-flashcards.com/ru/online-flashcards-maker>), the mobile application (<https://lexilize.com/ru/>), Quizlet, Anki, etc. A feature of Quizlet is that the service can be used in several modes: consolidating material and combining cards ("modules") into courses. After learning a new part of theory, it is possible to match pairs of cards, to do a test, or to give the answer independently. Anki is the easiest to prepare card set. While memorizing words, it is possible to use the board, make notes and save, then download everything to your phone and work offline.

Lexilize Flashcards offers a spectacular user interface, various games ("Guess", "Recall" and "Make a pair"). After the student learns a new set of words, the application offers to revise the material after a while.

The following criteria were used as selection criteria: type of technology (cloud/online or offline), financial basis (free/commercial), functionality (types of interactive tasks, the possibility to create own maps and print them), interface and design. Based on the analytical work, the Lexilize Flashcards service (<https://lexilize.com/ru/>) was chosen. Its advantages are: work without the Internet; automatic pronunciation of all studied words and phrases; memorizing only "one's own" words and phrases with a system of interval revising; import words from Excel files; support for 118 languages; non-linguistic categories (medicine, mathematics, history) and others.

The author's testing and Torrance Tests of Creative Thinking (Non-verbal tasks (Figural)) was used to assess the level of development of the verbal creativity. The scoring procedure is described in detail further in 4.3.1.

Thus, it was possible to collect data on 60 first-year students of Vyatka State University of the training program "Psychology" (bachelor degree level). The experimental (30 students) and control (30 students) groups were formed. The sample was not random. The average age of the respondents was 19 (78 % female and 12 % male).

The second stage of the experiment was devoted to changing the structure of classes in accordance with the purpose of the study. The teacher of the discipline "Electronic resources in the professional activity" studied the digital service for creating flash cards/using a ready-made set. Then, in the foreign language classes vocabulary and grammar were studied.

The third stage of the study. When organizing practical work, research and creative activities, the students were offered to arrange the studied concepts, new words and set expressions in the form of a set of flash cards. The students could use Lexilize Flashcards (<https://lexilize.com/ru/>) as a computer program. But they were also free in their choice and could use another digital service.

4. Results

4.1. Clarification of the essence of the basic concepts

In the course of the analysis and generalization of the scientific literature the author's positions regarding the key concepts of the study, which are "flash card", "verbal component of creativity" in the digital educational environment of the university, were determined.

In the course of the analytical work with the literature it was substantiated that:

- development of linguistic diversity, promotion of dissemination of creative ideas, inclusion of digital resources in teaching foreign languages - initiatives supported at the level of UNESCO;
- creative thinking determines many professional competences of future specialists;
- creativity of speech is the ability of the person to think creatively;
- teaching a foreign language has a powerful didactic potential for development of the verbal creativity;
- in the modern educational space new digital tools appear that create additional conditions for development of creativity in general, and the verbal creativity in particular.

Flash cards are thematic cards depicting objects or concepts, presented in electronic form. Effectiveness of using flash cards for development of the verbal creativity was tested during training of specialists whose future professional activity involves solving problems in the field of education, healthcare, culture, sports, management, and social assistance to the population.

The verbal component of creativity is measured both in terms of speech development (vocabulary, morphology, word formation, syntax, pronunciation, etc.) and in terms of psychological processes leading to new results (Torrance Tests of Creative Thinking).

The study considers that creativity by Torrance is the desire to combine diverse information.

E. Torrens developed 12 tests, dividing them into verbal, visual and sound tasks.

The use of the verbal tasks requires special psychological education. It is necessary to use an album with stimulus materials. In addition, it takes more time to conduct and process materials on the verbal tasks. The Non-verbal tasks (Figural) was adapted at the Institute of General and Pedagogical Psychology under the auspices of the Association of Psychological Sciences in 1990.

Non-verbal tasks allow you to analyze five indicators: "fluency", "originality", "elaboration", "short circuit resistance" and "abstractness of names". Note that it is these criteria that J. Guilford is guided by when evaluating verbal creativity (Guilford, 1968).

Materials for tasks implementation and processing can be used by pedagogical specialists of the highest category. It was under such conditions that the Non-verbal tasks of the test were chosen for research.

The process of developing student's verbal creativity in the digital educational environment of the university acquires a new specific type of mastering social and professional experience through interaction with digital technologies.

Flash cards are an effective tool for influencing, stimulating, enhancing educational activities, but it is not the only one and has certain limitations in use. The best option is to combine this method with others, traditional or innovative: tests, textbooks, studying grammar and rules in the

classroom, communicating with native speakers, training videos. A new (creative) product may result from a random pronunciation/spelling error or from a combination of flash cards.

4.2. Educational activities of students in services for working with flash cards

According to the logic of the research program, in “Electronic resources the professional activity” classes students studied services for working with flash cards. The following are the examples of tasks they performed in the software environment:

1. Compile sets of words by topic/category in the form of a text document and an electronic sheet.
2. Install the flash card application.
3. Study the interface and functionality: selecting native language and language to learn, selecting the type of subscription (free/premium), studying ready-made categories of words and adding new ones, editing words.
4. Design flash cards for studying new material (for example, to study the biography of a psychologist, a list of new professions).
5. Do game tasks for consolidation and systematization: games “Guess!”, “Remember”, “Find a pair”.
6. Apply sets of cards in a specific communication situation (psychological consultation, conflict resolution, etc.).

Specific practical results that marked the end of practical activities in the flash card service:

1. Theoretical knowledge about interactive tools in professional activities.
2. Formation of skills to use ready-made flash cards and create own. Understanding the practical value of products of this service for solving future professional problems.
3. Own sets of flash cards reflecting specifics of the subject.

Further, the students of the experimental group used flash cards when learning a foreign language.

The task for development of fluency. There are two students in each team. The recommended number of flash cards is nine for each team. Didactic effect of the exercise: working out words related to one part of speech or topic. For example, the names of animals, professions, interior items, etc. For each pair of teams, own version of flash cards can be used. Subsequently, sets of flash cards can be combined. Another option: scientists who studied the psyche in the course of experiments on animals.

A set of nine flash cards is presented in such a way that the words are on the front side. Students had to memorize as many words from the set as possible within 2-3 minutes. Next, the group is shown the back of the flash cards. And the participants are invited to name all the words of the original sequence. The winner is the team which members named more words and did not repeat during interaction.

The task for remembering spelling: write the words from the original set of flash cards from memory.

The task for development of speech flexibility. Two students participate. The recommended number of flash cards is 5 for each player, it is possible to use more (depending on the didactic goal, the duration of the game, the level of training of students). Flash cards indicate phrases where a dash is used instead of the last word. The teacher mixes a set of flash cards and distributes them to players. The first participant reads out the phrase. The second participant is given the task to give the missing word. If the second player finds it difficult and cannot continue the phrase (offer a flash card), then the move is passed to the first player.

Let us consider an example of a task based on flash cards for development of originality of speech. The teacher draws a star and a flash card is laid out at each end. The task of the participant is to explain the essence of the subject, the phenomenon with the help of their flash cards. For example, "Psychologist" is a specialist who received a higher humanitarian education, training program "Psychology"; "Psychologist" is Sigmund Freud.

The described version of the game contributes to development of skills to explain words in a foreign language.

An example of another (combined) option for organizing work: “What should be taken to a desert island”. The teacher prepares a set of flash cards for students, from the set the students must choose only three. These flash cards are symbols of those items that they will definitely take with

them to an imaginary island. Participants can also argue why they made this choice. First, the students make their own decisions. Then they work in pairs, it is necessary to unanimously decide which flash cards (items) should be taken. Then the students work in mini-groups of four people, then – eight people, etc. (depending on class size). As a result, the team must make a decision unanimously.

In the control group the students studied software tools for creating flash cards as part of the discipline “Electronic resources the professional activity”. However, there were no specially organized activities to include flash cards for development of fluency, flexibility and originality of speech in foreign language classes. The students of the control group studied the material doing exercises and assignments of the work programs. An example of the exercise: words were presented to the students on a paper sheet/in electronic form. The students from the control group had to explain what each word is associated with. For example: profession is a business (labor activity) in which a person is engaged; profession is a business in which a person receives money; profession – specialty; profession – to defend the Motherland.

4.3. Experimental assessment

4.3.1. The ascertaining stage of the experiment

Materials specially designed for testing were used to assess the level of development of verbal creativity.

The following blocks “Vocabulary”, “Morphology”, “Word formation”, “Syntax”, “Pronunciation”, “Torrance Tests of Creative Thinking (Non-verbal tasks (Figural)) were defined.

The auxiliary methods of computer data processing are also used: presenting in the form of tables, diagrams, graphs, presentations and “*.pdf” files.

The technique “Classification of concepts” is aimed at revealing the level of generalization. 30 various pictures (including images of the future profession) are used. Next, the number of correct choices of pictures is calculated both by category and in general. For each correct choice 1 point is given. The highest score is 30 points.

The technique “Finding synonyms” is aimed at revealing the level of synonym selection. The student is asked to choose a word that is close in meaning to the given word. 10 words from everyday life and professional sphere are presented. The student receives 1 point if the chosen word is a synonym; 0 points if the selected word does not match the semantic field of the given one. The highest score is 10 points.

The technique “Giving definitions” is aimed at revealing the level of giving definitions. The student is asked to give as many definitions for the given word as possible. 5 words are presented (everyday life, profession). The student receives 2 points – if more than 3 definitions are given; 1 point – if less than 3 definitions are given; 0 points – if the answer is not given or it does not correspond to the semantic field of the presented word. The highest score is 20 points.

Thus, in the block “Vocabulary” the maximum of 60 points is given.

The technique “Checking formation of a conscious attitude to grammatical constructions” offers the students to listen to the phrase and determine which forms are used incorrectly. 5 phrases from everyday life and the professional sphere are presented. The student gets 2 points for a correct answer. The highest score is 10 points. This score is the total for the “Morphology” block.

The technique “Checking the ability to critically assess speech” helps to find errors in the use of word formation methods; the students are invited to listen to incorrect word forms and express their opinion. 5 word forms from everyday life and the professional sphere are presented. The student gets 2 points for a correct answer. The highest score is 10 points. This score is the total for the “Word Formation” block.

The technique “Checking the ability to construct sentences” presents the student three words (everyday life, profession). From the words the student has to make up a sentence, the example of words is: friends, walk, park, read, memoirs, psychiatrist. Four sets of words from everyday life and the professional sphere are presented. The student receives 3 points for a correct answer. The highest score is 12 points. This score is the total for the “Syntax” block.

The study of the sound side of speech is supported by the technique “Examination of sound pronunciation”. During it the student is presented 12 pictures showing necessary sounds at the beginning, middle, end of the word. The student is asked to independently name the depicted object. If the student makes a mistake in pronunciation, he/she is advised to listen to how the

sound is pronounced and repeat. In the case of correct pronunciation, it can be concluded: the sound is present, but it is not automated (not fixed). Each indicator is assessed separately. The highest score is 12 points, which is total for this block.

Torrance Tests of Creative Thinking (Non-verbal tasks (Figural)) uses three tasks. Answers to all tasks are given in the form of drawings and captions to them. The time for completing the task is not limited, since the creative process involves free organization of the temporary component of the creative activity. The artistic level of drawings is not taken into account. The interpretation of the results of the Torrens test was made according to the methodology. The analysis added up all the scores obtained when assessing five factors. The total sum was divided by five.

Thus, as a result of the initial diagnosis each student scored from 30 to 174 points. To determine the level of formation of the verbal creativity (according to the sum of all 6 blocks), the levels "bad" (from 30 to 49 points (inclusive)), "below the norm" (from 50 to 89 points (inclusive)), "norm" (from 90 to 149 points (inclusive)), "above the norm" (from 150 to 173 points (inclusive)), "excellent" (more than 174 points).

The experimental (30 students) and control (30 students) groups were formed. The sample was not random.

4.3.2. Forming stage of the experiment

This stage of the experiment was devoted to the use of a flash card when studying a foreign language and selecting exercises for development of the speech creativity.

Examples of tasks to be done using flash cards.

1. A set of flash cards is prepared on a specific topic ("My future profession"). Words for practicing - "psychologist", "teacher", "mentor", "tutor", "preschool psychologist", etc. Next, flash cards are presented in turn or randomly. As soon as the student sees a word related to his/her future profession, he/she must say Stop. If the student is right, then the group makes a judgment: "That's right, It's a...".

2. The teacher or expert shows four/three flash cards on the interactive whiteboard. Each word is said in turn. The students close their eyes. The teacher or expert removes one card and asks: "What's missing?".

3. The teacher or expert shows on the interactive whiteboard several flash cards (for example, pieces of school furniture). The students name them, and then give a description of one subject. This game is useful in that it makes it possible to connect new vocabulary with already familiar words.

At the control stage of the experiment the verification work was also carried out on the materials.

4.3.3. Control stage of the experiment

At the fixing stage of the experiment testing was again carried out according to the methods of 6 blocks. The data after the experiment are presented in [Table 1](#).

Table 1. The results of measurements on the level of development of the verbal creativity

| Level | Groups | | | |
|------------------|----------------------------|----------------------|-----------------------|----------------------|
| | Experimental (30 students) | | Control (30 students) | |
| | Before the experiment | After the experiment | Before the experiment | After the experiment |
| «Bad» | 3 | 1 | 3 | 2 |
| «Below the norm» | 6 | 2 | 7 | 8 |
| «Norm» | 14 | 8 | 13 | 12 |
| «Above the norm» | 5 | 8 | 5 | 5 |
| «Excellent» | 2 | 11 | 2 | 3 |

In this case the hypotheses are formulated as follows.

H₀: the level of the verbal creativity in the experimental group is statistically equal to the level of the students in the control group; H₁: the level in the experimental group is higher than the level of the control group. Further, the values of the criterion were calculated in the online resource before (χ^2 obs.1) and after (χ^2 obs.2) the experiment. For $\alpha = 0.05$, according to the distribution tables, χ^2_{crit} is 9.488. Thus, $\chi^2_{obs.1} < \chi^2_{crit}$ ($0.114 < 9.488$), and $\chi^2_{obs.2} > \chi^2_{crit}$ ($9.997 > 9.488$). Therefore, the shift towards increasing the level of the verbal creativity of the students of the experimental group can be considered non-random.

In other words, participation of future teachers in creation of flash cards and their use in foreign language classes made it possible to provide additional conditions for development of demanded digital skills, experience in systematic control and self-control; formation of communication skills, imagination; understanding relationships, principles and algorithms of word formation; activation of attention and memory, etc. Corresponding changes in the pedagogical system are not accidental, but they are predictable.

5. Limitations

The sample of students was not probabilistic, since the experimental and control groups were formed in such a way as to guarantee the presence in each group of the same skills and personality traits that form the basis of the verbal creativity of future educational psychologists, their identical distribution.

The article used the Non-verbal tasks (Figural) of the Torrance Tests of Creative Thinking to indirectly assess verbal creativity.

For diagnostics the results of the input control testing were taken into account. The selection of the experiment participants and the sample size are justified by the specifics of the study: the study of theoretical material on the methods of work for development of lexical and grammatical material, development of the verbal creativity, digitalization of studying at university (in particular, teaching a foreign language).

The problem is that simultaneous and integrated studying of the discipline "Electronic resources in the professional activity" and "Foreign language" is implemented in the training program for a limited number of specialties. Throughout the experiment practical activities for solving the described problems, supported by services for creating flash cards, were carried out by the same teacher, using the same software equipment in special classrooms. The implementation took into account the basic principles of digital didactics in higher education, the intercultural approach to teaching a foreign language.

6. Discussion

The quantitative analysis of the obtained data showed that after the completion of the experiment 37 % of the students in the experimental group had a "high" level of the verbal creativity (11 students out of 30), which was 7 % initially (2 respondents out of 30). The number of students with "below the norm" and "poor" levels significantly decreased from 30 % to 10 %. For the control group the following was recorded: the indicator for the level of "excellent" qualitatively changed from 7 % to 10 %, and for the level of "bad" – from 10 % to 7 %.

From the functionality of services for creating interactive cards and sets of flash cards, which have a positive didactic effect on development of the verbal creativity, the participants of the experiment noted: the use of accounts of global social networks (Facebook, Instagram); the possibility to repeat words, import from spreadsheets; creating own categories of words; work on the computer and in the mobile application. Also in the discussion the following areas for improving the service were highlighted:

- possibility to change the location of the button for voicing words on cards;
- possibility to configure the application so that one side of the card is shown first, and then the other. That is, at first the user translates from Russian into English, and then from English into Russian.

The following didactic possibilities of flash cards were identified in relation to learning in the conditions of development of the modern digital educational environment: active participation in the process of learning a foreign language; didactic games using digital services; development of creative thinking, speech, intelligence; systematization and generalization of the material; new forms of control; possibility to learn independently.

The latter is of particular importance in the context of training highly qualified specialists of the future. Indeed, the participants in the experimental group received additional conditions for training concentration of attention and memory, fostering self-motivation, developing critical thinking, and gaining experience in independent work planning.

The research materials are consistent with the principles of the UN and UNESCO regarding the need to develop linguistic diversity, to promote creative ideas, and to include digital resources in education (UNESCO: *Building peace...*, 2022; UNESCO. *Alamaty*, 2022). In addition, the practical results of the study can be applied at international events which introduce new approaches to development of the foreign language communication (for example, in trainings, conferences for the exchange of experience).

The formulated conclusions supplement the conclusions of C. Lai et al. regarding the potential of flash cards for the individual approach, for group work (Lai et al., 2020). In addition, the obtained results expand the ideas of M. Van Dijk et al. regarding the range of didactic means for development of the creativity of speech (Van Dijk et al., 2020).

7. Conclusion

In the present study creativity is considered in relation to speech as the ability to speak in an original, non-standard, interesting way. As a consequence, the verbal component of creativity is measured both in terms of speech development (vocabulary, morphology, word formation, syntax, pronunciation) and in terms of psychological processes leading to new results (fluency, originality, flexibility). A distinctive feature of the proposed approach is the following: flash cards and a learning tool (in the course “Electronic Resources in Professional Activities”); a learning tool (in foreign language classes); a new tool for self-expression. For example, with the help of flash cards developed in the Lexilize Flashcards service (<https://lexilize.com/ru/>) students prepared a thematic story on career guidance for applicants.

In other cases flash cards were actively used in other classes for modeling psychological situations, communication problems, and biographical descriptions. The flash card method was also used in art therapy classes as a support for self-discovery in a comfortable atmosphere.

When summarizing the results of the pedagogical experiment, the rules were formulated, implementation of which ensures effectiveness of using flash cards for development of students' verbal creativity:

1) Mechanical reading of information on the flash card is not recommended. It is advisable to use game techniques, facial expressions/gestures; to give an analogy; to use other visual means (animation, sketches); to argue own position;

2) It is recommended to use ready-made sets of flash cards only at the initial stage of training. Creating and enriching own flash card system is much more effective in terms of developing the speech creativity. Before working in such a system it is necessary to answer a number of questions: how regular the use of flash cards will be, whether the set is universal or professional; how to group cards into categories; what the period for updating the content of flash cards is;

3) Work with flash cards should support personal and professional development;

4) It is helpful to use mnemonics. Dynamic images in infographics have a positive effect on formation of linguistic guessing skills, which activates the chain of mental operations. Mnemonics can be effectively used when learning new words (learning); converting words into images (coding); formation of links between reference images and memorized images (memorization);

5) It is desirable to pronounce answers (words on flash cards) aloud. This technique makes memorization more vivid, as it uses the auditory channel;

6) Flash cards should not be considered as a universal didactic tool.

Thus, flash cards contribute to development of students' verbal creativity. The materials of the study allow to reasonably assert that using flash cards in teaching provides additional conditions for development of human creative abilities.

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