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**Abstract.** The aim of the paper is viewing the ways to develop learners' creativity potential. The concept of learners' creativity potential is defined. The structure of creativity potential is specified. Two groups of activities included into the technology are described: the activity of the teacher (activating, cognitive-search, reflexive components); creative self-actualization of students (motivational, procedural, effective components). The methodology of the research includes case study and pedagogical experiment (the pretest-post-test control and experimental group design). Data are gathered by means of conversational interviewing. The research results in suggesting a technology to develop learners' creativity potential. The paper includes the results of testing the impact of the technology on the level of creativity. The criteria of development of divergent thinking fluency, flexibility, originality, accuracy; self-reliance; imagination; creative motivation; reflexive-analytical skills were considered. Statistical data processing is performed applying the chi-square test. It shows that the suggested technology is effective in developing learners' creativity potential.

**Keywords:** creativity potential, future teachers training, professional development

## INTRODUCTION

Since December 2012 the Federal Law "On Education in the Russian Federation" no 273-FZ (Ministry of Education and Science of the Russian Federation, 2012) has introduced the obligation to improve methods and technologies of teaching (Art. 28, paragraph 12). This improvement might be more effective if learners are engaged in the development of their creativity potential, which allows raising the level of personality development.

Learners' potential is viewed in the paper as the state of the possible which under definite conditions might be transformed into the actual. Learners' creativity potential is to induce the student to manifest and develop the creative individuality.

Learners' creativity potential has been investigated and discussed from different points of view. A.E. Gubareva has viewed the issue in the process of organizing students' independent work (Gubareva, 2009). T. Yuryeva, G. Rostoshinskaya have connected learners' creativity with the ability to choose and responsibility (Yuryeva, & Rostoshinskaya, 2011). Yu. Sharonin has investigated the ability of a creative learners to improve their skills (Sharonin, 2013). V. Dolgova, Y. Rokickaya, E. Volchegorskaya, E. Yemelyanova and N. Uvarina have viewed the problem on the basis of parents' assistance in the learner's development (Dolgova et al., 2016). Creativity in professional activity has been the focus of research in vocational education (Malakhova, 2014). The aim of the present research is to introduce the technology of the development of learners' creativity potential.

In connection with the purpose the article addresses three research questions: 1) what components the development of learners' creativity potential consists of; 2) what activities might enter the technology to develop learners' creativity potential; 3) what is the technology's impact on the development of learners' creativity potential.

## METHODOLOGY OF RESEARCH

Methods used consist of Case Study and Educational Experimentation.

### Case study

The methods of case study envisages a purposeful selection of school teaching on different levels of education. All the 14 educational establishments engaged in the research are situated in the Urals. Eight schools are situated in cities and towns, five schools are village schools. Besides one educational establishment is a Teachers Training University. All the schools engaged in the research are typical of Russian state educational establishments licensed and accredited by the state.

### Educational experimentation

Educational experimentation has been implemented in the form of “the pretest-post-test control and experimental group design” (Cohen et al., 2007). The experiment lasted eight academic years (2010-2018).

### Instruments and procedures

The quantitative data have been obtained by means of conversational interviewing. The data collecting method was carried out to study the staff opinions about the level of learners' creativity potential. Several interviews were carried out throughout educational experimenting. Statistical data processing was performed using the chi-square test.

### Sample

To conduct the experimental research three groups of respondents, have been engaged (n = 685). During the research to measure the level of learners' creativity potential 463 learners enrolled in primary, secondary, high and higher educational programs (n = 463) took part. Part of respondents (n = 161) entered the experimental group, others (n = 302) entered the control group. Their creativity potential has been measured by 222 teachers working in different educational programs: primary, secondary, high, higher.

### Analysis of the development of learners' creativity potential structure

Phase one of the work addressed the research questions “what components the development of learners' creativity potential consists of” and “what activities might enter the technology to develop learners' creativity potential”. On the basis of our research it has been concluded that the structure of learners' creativity potential development should include:

- the activity of the teacher (activating, cognitive-search, reflexive components);
- creative self-actualization of students (motivational, procedural, effective components).

Methods and activities to develop learners' creativity potential suggested by the teaching staff are presented in Table 1.

**Table 1**  
**Types of activities to develop learners' creativity potential**

No	Components of developing learners' creativity potential	Methods and activities
1	The activity of the teacher	Brainstorming method Asking questions method Transferring functions method Delaying functions method
2	Creative self-actualization of students	Problem solving activity Subjective analogy activity Direct analogy activity Symbolic analogy activity Fantastic analogy activity

Source: own study.

As the experiment involved learners from different levels of education (from primary up to higher school), activities were adjusted to each age group. The tasks were made up in accordance with recommendations of scholars (Kovalenko & Kovalenko, 2017), (Petra, 2017), (Kostromina et al., 2017).

## RESULTS

The last research question was about the technology's impact on learners' creativity potential. Answering the third research question the level of learners' creativity was measured. C1 – C8 are the measured criteria. They are:

- C1 – development of divergent thinking fluency;
- C2 – development of divergent thinking flexibility;
- C3 – development of divergent thinking originality;
- C4 – development of divergent thinking accuracy;
- C5 – the level of self-reliance;
- C6 – the level of development of the imagination;
- C7 – the level of the formation of creative motivation;
- C8 – the level of reflexive-analytical skills.

The value 3 was attributed to high level, of the criterion, 2 was attributed if the level was above average, 1 was attributed if the level was medium, 0 meant that the level was low. The total score varied from 0 to 24 points.

Creativity potential levels values ranges are as follows. Low level is 0-6 points, medium level is 7-12, above average level is 13-18, high level is 19-24. High and above average levels are considered to be sufficient.

The learners' level of creativity potential was measured. As shown in Table 2.

**Table 2**  
**Technique for assessing creativity potential level**

Learners	C1	C2	C3	C4	C5	C6	C7	C8	Total	Level
Learner 1	3	3	2	3	2	2	3	3	20	high
Etc.										

Source: own study.

The experiment envisaged several measurements. The first one was done before the experiment, the last one took place after the experiment. Data was obtained from the experimental group (EG) and test group (TG).

According to the data obtained in the experimental group the number of students with a high level increased from 4.9% to 19.3%. At the same time, the number of learners with low level of creativity changed from 63.3% to 2.5%. Differences in the results of diagnostics before the experiment and after its completion are significant at the levels of 0.05 and 0.01:  $\chi^2$ critical values are 5.991 and 9,210 (Ermolaev, 2002).

Before the experiment the empirical value of chi-square was 5.6, i.e. significantly less than the chi-square critical. Consequently, the difference between creativity potential level in EG and TG before the experiment was not statistically significant.

After the experiment the empirical value of chi-square was 24.2, i.e. much greater than chi-square critical. It can be concluded that creativity potential level changes were not accidental, but due to the suggested technology implementation.

## DISCUSSION

The results of the experiment show that positive changes have taken place in the experimental group in the development of learners' creativity potential. But the dynamics of these changes showed that in some criteria the first reaction of certain groups of learners to the technology was negative.

In the development of divergent thinking fluency in the second measurement lower results were obtained in junior learners' activity. Then the results improved.

The development of divergent thinking and flexibility showed stable growth throughout the experiment. The development of divergent thinking originality also showed stable growth. Different groups of learners achieved higher results in this criterion at a different pace. The development of divergent thinking accuracy increased throughout the experiment. The level of self-reliance in the beginning of the experiment decreased, though this decrease did not indicate the total lowering of the level of creativity potential. Then the experiment showed stable growth of the criterion. The level of development of imagination first became lower, then increased. The results obtained with the level of the formation of creative motivation and reflexive-analytical skills were similar.

These results might indicate that the technology should be more specified when teaching primary school students.

## CONCLUSION

In accordance with the first research question it was stated that the structure of learners' creativity potential development included: the activity of the teacher (activating, cognitive-search, reflexive components) and creative self-actualization of students (motivational, procedural, effective components).

In accordance with the second research question it was suggested that the technology should be based on the methods of brainstorming, asking questions, transferring functions, delaying functions. The following activities were implemented in the technology: problem solving, subjective analogy activity, direct analogy activity, symbolic analogy activity and fantastic analogy activity. Tasks suggested to the learners were adjusted to each age group.

In accordance with the third research question the level of creativity was measured based on eight criteria: development of divergent thinking fluency, flexibility, originality and accuracy; self-reliance; development of imagination; stimulation of creative motivation; reflexive-analytical skills. Chi-square testing was implemented and showed that the technology resulted in a higher level of learners' creativity potential, which means that the technology is effective.

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