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METHODOLOGY FOR DEVELOPING STUDENTS' INNOVATIVE AND CREATIVE THINKING COMPETENCIES BASED ON DESIGN THINKING TECHNOLOGY

Vafayeva Zarrina Xashimovna
Samarkand State Institute of Foreign Languages
Faculty of English, Department of Educational Technologies and Methodology,
Associated Professor

Abstract: This article examines the methodology of developing students' innovative and creative thinking competencies through Design Thinking technology in higher education institutions based on requirements. In modern pedagogy, shaping students' skills to solve problematic situations outside traditional patterns by focusing on human needs is a crucial issue. Within the scope of the research, integrated interactive approaches in the speech and professional activities of foreign language faculty students, as well as the role of aesthetic and individualistic thinking in the educational system, are analyzed. Quantitative indicators obtained on the basis of practical experiments demonstrate the growth rates of students in the stages of problem definition, idea generation, and prototyping.

Keywords: Design Thinking, innovative competence, creative thinking, pedagogical methodology, interactive approach, intercultural communication, educational technologies.

Introduction

In the context of modernizing the higher education system, increasing the professional competence of future specialists is determined not only by their mastery of theoretical knowledge, but also by their ability to make flexible, creative, and non-standard decisions in a changing socio-economic environment. The modern labor market demands that students apply innovative technologies in any field and solve problems through cognitive empathy. To achieve these goals, the Design Thinking methodology, which has proven effective on a global scale, is being actively implemented into the educational process. Design thinking is a creative approach that prioritizes the human factor, their emotional and rational needs, in solving any problem and aims to bring ideas to the level of practical models [6; 45–48-p.].

In pedagogy and methodology, the concept of creativity is interpreted not merely as a sign of artistic skill or talent, but as a higher manifestation of systemic thinking. Studying individualism and its literary-aesthetic foundations creates a historical and practical baseline for expanding students' professional worldviews and revealing their independent thinking abilities. In particular, the concept of individualism in the literature of the Romantic era brought to light the inner potential of the individual, their creative freedom, and their unique, subjective approach to problems in the environment [1; 352–353-p.]. Projecting this concept onto the educational system serves to strengthen students' confidence in their own creative potential.

The unique nature of Design Thinking technology lies in the fact that it teaches students to work in a collaborative environment and view a problem from a multi-faceted perspective. This process is directly and closely linked to the formation of intercultural competence among students across different age groups. Organizing language learning and lesson processes through interactive

methods ensures the mutual integration of students in the communication system and the transfer of creative ideas [2; 160-p.]. From a methodological standpoint, expressing ideas freely and testing them in a team increases students' verbal-cognitive reflection.

Any methodological innovation in education must ultimately serve practical results, including the development of socio-economic spheres. For instance, in shaping economic models and the efficiency of regional tourism development, it is required to create creative projects that take into account the unique characteristics of the region [3; 15-p.]. Training students based on the principles of Design Thinking allows them to independently design and implement practical projects in sectors such as economics, tourism, and management, in addition to developing their language skills [4; 102-p.].

The purpose of the research is to develop a step-by-step methodology for applying Design Thinking technology using the example of foreign language faculty students and to experimentally substantiate the effectiveness of this approach in developing their innovative and creative thinking competencies.

Methods

The research work was conducted at the Department of Innovative Educational Technologies and Methodology, Faculty of English, Samarkand State Institute of Foreign Languages. A total of 120 third-year students studying English participated in the experimental-testing work. The students were divided into equal control and experimental groups. In the control groups, classes were organized on the basis of traditional communicative and problem-based learning methods, while in the experimental groups, they were conducted according to a specially developed methodology based on Design Thinking technology.

During the research process, the following five-stage set of pedagogical methods was applied:

1. Empathize stage. Students were given a real-life pedagogical or social problem (e.g., barriers to using digital technologies in education). Students used interview and observation methods to study the target audience.

2. Define stage. Based on the gathered information, the essence of the problem was systematized using clusters and cognitive maps, and a clear "problem statement" was formulated.

3. Ideate stage. Creative ideas were generated without restrictions using "Brainstorming" and SCAMPER methods. In this process, criteria for evaluating the pedagogical competencies of learners were taken into account [5; 89-p.].

4. Prototype stage. The best ideas were transformed into visual or structural forms (scenarios, designs of lesson models, digital platform mockups).

5. Test stage. The created prototypes were tested in inter-team discussions and pedagogical practice classes.

Torrance Tests of Creative Thinking (based on criteria of flexibility, originality, and fluency) and the expert evaluation method were used to measure students' creative and innovative thinking levels. Mathematical-statistical analyses were performed using Student's t-test.

Results

At the conclusion of the experimental-testing work, a significant positive growth dynamics was recorded in the innovative and creative thinking skills of the students in the experimental groups compared to the control groups. Each stage of Design Thinking technology served to activate specific cognitive operations in the learners.

The table below reflects the average indicators of students' creative and innovative thinking competencies (on a 10-point scale) at the beginning and end of the study, along with the statistical significance level of the difference between the groups.

Dynamics of students' creative and innovative thinking indicators:

Evaluation criteria and competence elements	Control group (Start of study)	Control group (End of study)	Experimental group (Start of study)	Experimental group (End of study)	Statistical significance (p)
Fluency of thought	5.2	5.8	5.3	8.4	$p < 0.01$
Flexibility	4.8	5.2	4.9	7.9	$p < 0.01$
Originality	4.1	4.6	4.2	8.1	$p < 0.01$
Problem modeling (Prototyping)	4.5	5.0	4.4	8.5	$p < 0.05$
Innovative decision making	5.0	5.5	5.1	8.2	$p < 0.01$

From the analysis of the table, it is clear that at the beginning of the study, the indicators in both groups were nearly equal and at a moderate level. However, at the end of the experiment, the "Originality" criterion in the experimental group increased from 4.2 points to 8.1 points. This shows that students developed the ability to find non-standard, unusual solutions to problems.

The highest growth rate was observed in the skill of "Problem modeling and prototyping" (from 4.4 points to 8.5 points, $p < 0.05$). This circumstance demonstrates that the stage of materializing or visualizing ideas within Design Thinking is an effective pedagogical instrument. In the control group, due to traditional teaching methods, the growth indicators were minimal (around 0.4–0.6 points) and did not carry high statistical significance.

Discussion

The obtained results confirm that in higher education lesson processes, particularly in English and methodology classes, it is necessary to develop students' general professional innovative thinking rather than restricting the focus solely to teaching linguistic rules. Design Thinking technology ignites a creative confidence in the student, giving them a sense of "I can do this." This process resonates with the principles of artistic and cognitive freedom. The individual creative nature of a person allows them to think outside any patterns and constraints, which is pedagogically very close to the concept of subjective creative freedom in the Romantic worldview [1; 355-p.]. A student's creative potential manifests fully only when they feel like an active subject solving a problem.

As identified during the research, the atmosphere of communication and cooperation among students during the stages of Design Thinking also enriches their socio-cultural skills. In the process of collaborative brainstorming, students master the skills of analyzing diverse perspectives,

tolerance, and accepting the views of others. This practically supports the concept of developing intercultural competence through interactive methods in modern language education [2; 161-p.].

Another important feature of Design Thinking technology is its capability to ensure interdisciplinary connectivity. While solving linguistic problems, students learn to connect them with practical, social, and economic contexts. For instance, analyzing regional projects, innovative service sectors, or problems in tourism infrastructure as cases during classes and finding design-solutions for them increases students' social responsibility [3; 18-p.]. Such an approach builds a critical and systemic approach in learners toward regional and global issues [4; 110-p.].

From a methodological point of view, implementing the Design Thinking methodology into practice requires high preparation and facilitation (guiding) skills from higher education teachers as well. The teacher must transition from a traditional lecturer to a consultant and coordinator, creating an atmosphere in the classroom where making mistakes is not feared [7; 52-54-p.]. This is a leading factor that ensures the readiness of future personnel for innovative processes in the educational system.

Conclusions

1. Design Thinking technology is a systemic methodology that yields higher efficiency than traditional pedagogical approaches in developing students' innovative and creative thinking competencies. It trains students to deeply feel problems (empathy) and find solutions based on human needs.

2. As a result of practical experiments, it was determined that the indicators of flexibility and originality of thought in the experimental groups increased significantly (at a significance level of $p < 0.01$). Especially, the prototyping stage served as a bridge in bringing students' theoretical ideas into the form of practical pedagogical models and projects.

3. Integrating Design Thinking principles into the curricula of higher education institutions' foreign language faculties establishes a foundation for shaping not only students' linguistic competencies, but also their designing, teamwork, and creative management competencies. This is an important factor in increasing the quality of training modern and competitive specialists.

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