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THE ORIGIN, SCIENTIFIC FOUNDATIONS, AND SIGNIFICANCE OF THE CONCEPT OF "INTERACTIVE TECHNOLOGIES"

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Abstract
This article presents a comprehensive scientific analysis of research conducted both globally and within Uzbekistan on interactive pedagogical technologies. It examines the development of such technologies, the works produced in this field, and evaluates their impact on the educational process, highlighting their role in enhancing teaching and learning outcomes.

Keywords: Scientific research, interactive technologies, education, quality of lesson, modern methodical technology.

Introduction

Interactive technologies represent a pedagogical process based on active, two-way, meaningful interaction between the preschool learner, the educator, and the educational environment. These technologies are complex systems aimed at increasing the effectiveness of teaching and upbringing. Their scientific-methodological foundations emerged from the integration of several disciplines, including pedagogy, psychology, communication, and information technologies.

Today, the significance of interactive technologies is immense. In particular, they ensure the rapid, convenient, and effective organization of processes in fields such as education, upbringing, management, medicine, production, and services. Under conditions of globalization and digital transformation, interactive technologies have become an integral part of modern education systems.

Interactive methods enhance the activity of preschool learners, foster independent thinking, support creative approaches, problem-solving, communication, and social competences. They also help cover topics more comprehensively, deepen conceptual understanding, and allow effective assessment of learning outcomes.

Interactive technologies simplify and increase the efficiency of the educational process at all levels—from preschool to higher education—providing broad opportunities for learners. Therefore, today, interactive technologies are recognized not only as teaching tools but also as one of the key factors determining the quality and effectiveness of education.

The term "interactive" originates from the Latin words inter (mutual) and act (to act), meaning "to interact" or "to act through communication." Since the second half of the 20th century, this term has been widely used in informatics, communication, and pedagogy. Interactivity primarily implies a process in which subjects influence each other, think collaboratively, and act through active communication.

In pedagogical practice, interactive technologies refer to a set of approaches that organize knowledge acquisition through active collaboration between the educator and the preschool learner, as well as among the learners themselves. Interactive methods transform traditional monologic teaching into dialogic, cooperation-based active learning formats.

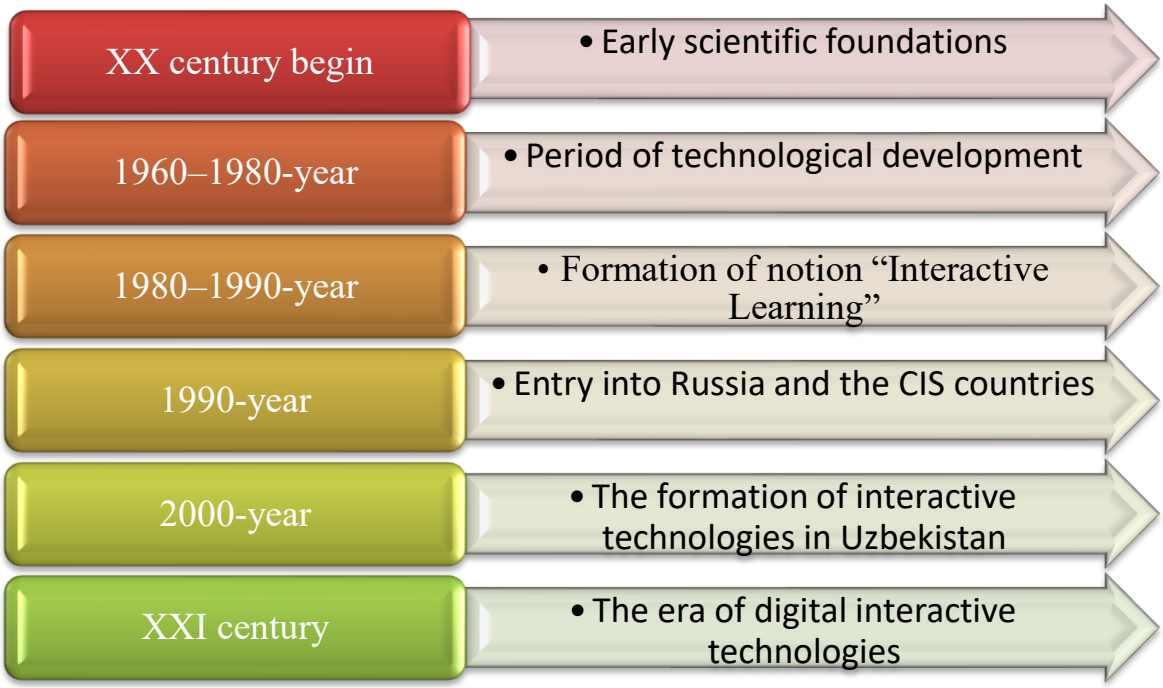

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Figure 1. Historical Development of Interactive Technologies

To explain the information illustrated above, the following points are presented:

1. Early Scientific Foundations (Early 20th Century)

The ideas of interactive learning trace back to the theoretical works of the following pedagogues:

- J. Dewey (USA) – experiential learning, active participation, learner-centered education
- L. S. Vygotsky – zone of proximal development, learning through communication, collaborative development
- J. Piaget, K. Lewin – cognitive development, group activities, experience-based learning

These ideas formed the scientific foundation of interactive methods.

2. 1960–1980s: Period of Technological Development

During this period, computers, audiovisual tools, and early training technologies emerged.

- "Interactivity" began to be used in informatics and engineering.
- In 1968, Dr. Douglas Engelbart introduced the "interactive computer system."
- In the 1970s, multimedia education and programmed instruction took shape.

These developments opened the way for interactive approaches in pedagogy.

3. 1980–1990s: Formation of the Concept of "Interactive Learning"

In the late 20th century, the concepts of interactive learning and active learning entered scientific discourse.

- 1984 – C. Bonwell & J. Eison introduced Active Learning as a scientific term.
- A. Osborne widely applied "brainstorming."
- T. Anderson, M. Moore – developed theories of interactive distance education.

Education began shifting from monologic to dialogic, cooperation-based interactive models.

4. Spread in Russia and CIS Countries (1990s)

From the early 1990s, interactive learning gained popularity in Russia and CIS countries. New methodological approaches—clusters, brainstorming, "aquarium," debates, role-play—were introduced.

Major contributors:

- G. K. Selevko – classification of pedagogical technologies
- V. P. Bespalko – instructional design
- A. A. Verbitsky – contextual learning
- S. Smirnov, I. Yakimanskaya – psychology of interactive methods

Interactive methods became established as a comprehensive didactic system.

5. Development of Interactive Technologies in Uzbekistan (2000s)

After independence, Uzbekistan began modernizing its education system.

Key developments:

- Introduction of pedagogical technologies, interactive methods, and innovative educational technologies
- Creation of the national education model
- Government programs supporting modern educational reforms

Key Uzbek scholars:

- J. Yo'ldoshev, A. Jabborov – theory of pedagogical technologies
- B. Ziyomuhammedov – innovative teaching methodology
- Sh. Abdullayeva, M. Tolipova – practical application of interactive methods

Methods such as Brainstorming, Boomerang, FSMU, B-B-B, Venn Diagram, Cinquein, and Small-Group Work became widely used.

6. 21st Century: The Era of Digital Interactive Technologies

Modern interactive technologies are integrated with digital tools:

- virtual laboratories
- multimedia educational platforms
- online interactive sessions
- AR/VR technologies
- AI-based learning systems Prominent researchers: G. Siemens, R. Mayer, M. Moore.

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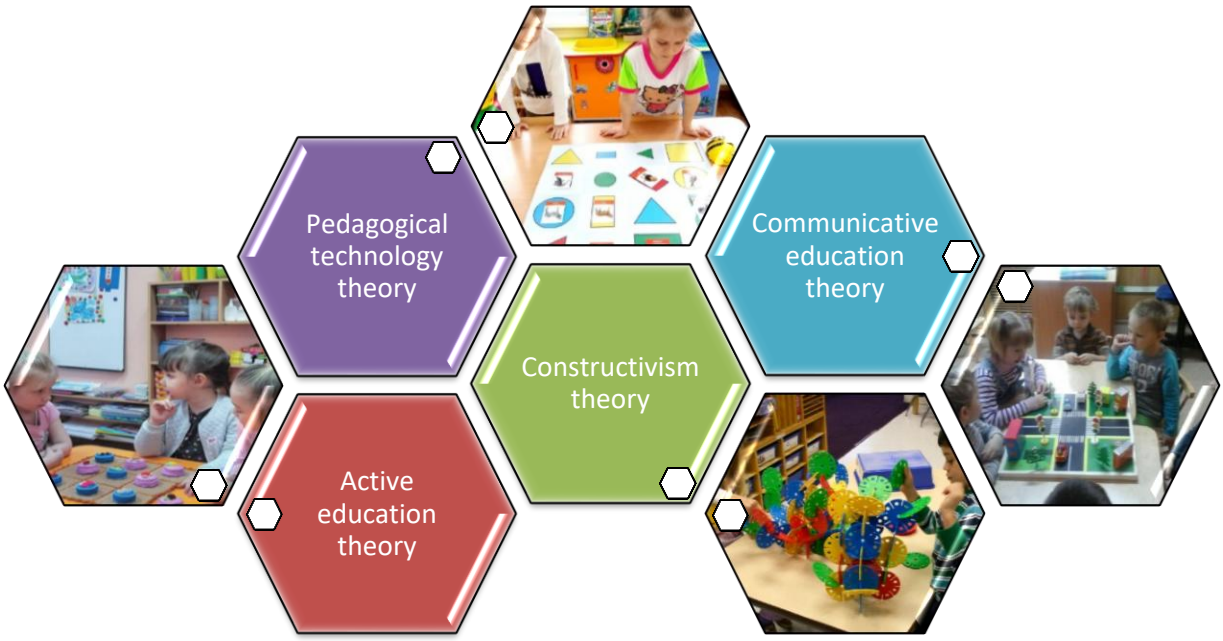

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Figure 2. Scientific-Theoretical Approaches to Interactive Technologies

Interactive technologies are based on the following scientific approaches:

1. Theory of Pedagogical Technology

Developed by V. L. Bespalko, M. Klarin, J. Codwoth and others. In this theory, the educational process is designed as a goal-content-method-assessment system.

2. Theory of Active Learning

Scholars such as J. Dewey, L. S. Vygotsky, B. Bloom, Bruner:
Learning is most effective when the preschool learner actively participates.

3. Constructivism Theory

Learners do not receive ready-made knowledge; they construct knowledge themselves.
Interactive technologies rely on collaborative knowledge construction.

4. Communicative Learning Theory

Communication, group work, exchange of ideas are the driving forces of learning.
Interactive methods such as Fishbone, Cluster, Brainstorming are based on this principle.
Today, interactive pedagogical technologies are considered as one of the most important factors in the educational process. They activate the educational process, develop the independent thinking and communication culture of the educated. Therefore, theoretical and applied research has been carried out in this direction by many scientists.

1. Theoretical-methodological foundations of interactive education. Theoretical foundation of interactive education it was shaped by scholars such as J. Dewey, L.S. Vygotsky, B. Bloom, and P. Freire. J. Dewey's ideas of ”experiential education” scientifically substantiated a

teaching model based on the activities of a preschool educator. And Vygotsky's ideas about the zone of close development justify the effective cooperation between the educator and the Educator of the preschool educational organization in interactive methods.

2. Interactive methods and their effectiveness. Researchers studying the practical effectiveness of interactive techniques-C. Silberman, A. Osborne, G. Selevka and others. They have scientifically proven the role of methods such as" mental attack"," cluster"," aquarium"," role-playing"," case-method " in activating the educational process.

3. Interactive teaching based on digital technologies. Digital tools in the modern educational process – virtual laboratories, multimedia applications, online platforms – have taken interactive education to a new level.igigital tools in the modern educational process – virtual laboratories, multimedia applications, online platforms – have taken interactive education to a new level. M. Moore, G. Siemens and R. Scholars such as Mayer have developed theoretical frameworks for online interactive learning.

4. Research on interactive technologies in Uzbekistan. Many scientific and methodological manuals on the introduction of interactive technologies into the training process have been created by J. Yoldashev, A. Jabborov, B. Ziyamuhammedov, Sh. Abdullayeva, M. Tolipova. They have developed methodical approaches adapted for the national education system.

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6. The impact of interactive technologies on the motivation of preschool children. Slavin, Johnson & Johnson and E. Research conducted by Dale has shown the effectiveness of interactive education in the development of motivations, social activism, and competencies of preschoolers.

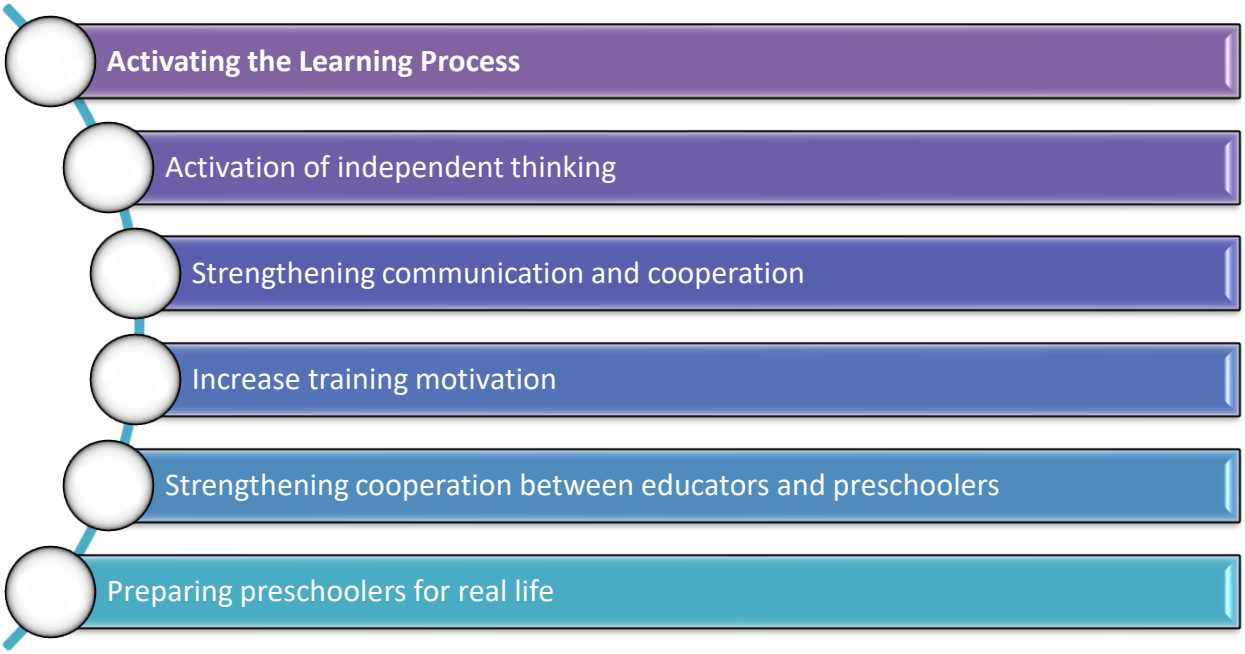

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Figure 4. The Importance of Using Interactive Technologies

Let us consider the following important aspects of using interactive technologies:

a) Activates the learning process. The preschool learner becomes not a passive listener, but an active participant. It teaches through question–answer sessions, group work, and problem-based tasks.

b) Enhances independent thinking. The learner does not receive a ready-made answer but finds the solution independently. Skills of analysis, comparison, and evaluation are developed.

c) Strengthens communication and collaboration. Group work and role-play activities develop preschool learners' speech, communication culture, and teamwork skills.

d) Increases learning motivation. Lessons become interesting and effective. The preschool learner begins to take an interest in learning.

e) Strengthens cooperation between the educator and the preschool learner. The educator becomes not a commander but a guide.

This creates a democratic learning environment.

f) Prepares preschool learners for real life. Interactive methods are based on practice and real-life situations. Multimedia, interactive whiteboards, virtual laboratories, and electronic resources enrich the educational process with visual, auditory, and kinesthetic methods. This, in turn, enriches cognitive processes.

Conclusion

Interactive technologies have, over several decades, become one of the key directions of the modern educational system as a result of the integration of pedagogy, psychology, and technological sciences. Today, interactive methods not only enliven the teaching process but also serve as one of the most effective tools for developing:

- independent thinking in preschool learners,
- analytical skills,
- creativity,
- communication and collaboration skills,
- and essential competencies.

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