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THE DIDACTIC POTENTIAL OF MNEMONIC TECHNOLOGIES IN ENHANCING THE COGNITIVE COMPETENCE OF FUTURE PRESCHOOL EDUCATION TEACHERS

Munisa Qambarova

Andijan State Pedagogical Institute, Uzbekistan

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Abstract: The development of cognitive competence is an essential component of the professional preparation of future preschool education teachers. This article explores the didactic potential of mnemonic technologies as an instructional approach to improving students' information processing, comprehension, systematization, and long-term retention of educational content. Particular attention is paid to the relationship between mnemonic techniques, associative thinking, logical reasoning, attention, and independent learning. The study employs theoretical analysis, comparative analysis, synthesis, and pedagogical interpretation of scientific literature to identify the educational opportunities of mnemonic technologies in higher education. The findings indicate that the systematic integration of visualization, association, semantic grouping, symbolic coding, and mnemonic models into the teaching process can create favorable conditions for developing students' cognitive competence. The article also emphasizes that mnemonic techniques should not be limited to mechanical memorization but should support meaningful learning, knowledge transfer, and the development of professional pedagogical thinking. The proposed methodological approach may be applied in the professional training of future preschool education teachers.

Keywords: mnemonic technologies, cognitive competence, cognitive development, associative thinking, information processing, visualization, long-term memory, meaningful learning, preschool education teachers, professional training.

1. INTRODUCTION

In contemporary higher education, the professional preparation of future preschool education teachers requires more than the acquisition of theoretical knowledge. It involves

developing students' abilities to perceive, analyze, interpret, organize, and apply information in different educational situations. These abilities constitute an important foundation for cognitive competence and professional pedagogical readiness.

The increasing volume of educational information and the introduction of digital learning environments require students to develop effective strategies for processing and retaining knowledge. In this context, mnemonic technologies represent a promising didactic approach that facilitates the meaningful acquisition, organization, and reproduction of educational information.

Mnemonics refers to a system of techniques and strategies designed to improve memory through associations, visualization, semantic organization, and symbolic representations. Its educational value lies not only in facilitating memorization but also in supporting the formation of meaningful connections between new and previously acquired knowledge.

The professional activity of preschool education teachers involves working with diverse educational concepts, developmental characteristics of children, methodological materials, pedagogical technologies, and regulatory documents. Therefore, future teachers need cognitive strategies that enable them to organize substantial amounts of information and apply it appropriately in professional practice.

In this regard, M.B.Tairova emphasizes the importance of developing the professional pedagogical competence of future preschool teachers through the purposeful organization of their professional preparation (Tairova, 2024). This perspective provides a theoretical basis for considering mnemonic technologies as one of the didactic resources that can support the cognitive component of professional competence.

The purpose of this study is to identify the didactic potential of mnemonic technologies in enhancing the cognitive competence of future preschool education teachers and to substantiate methodological approaches to their systematic implementation in higher education.

2. METHODS

The study is based on theoretical and analytical research methods aimed at examining the educational potential of mnemonic technologies in the professional training of future preschool education teachers.

The following methods were employed:

Theoretical analysis: examination of scientific and pedagogical literature concerning memory, cognitive development, learning strategies, and mnemonic techniques.

Comparative analysis: identification of the differences between traditional memorization and meaning-oriented mnemonic learning strategies.

Synthesis and generalization: integration of theoretical findings to determine the relationship between mnemonic technologies and cognitive competence.

Pedagogical interpretation: consideration of the applicability of mnemonic techniques within the academic disciplines of preschool education programmes.

Methodological modelling: development of a conceptual sequence for integrating mnemonic technologies into the educational process.

The analysis focused on five interconnected cognitive processes: perception, comprehension, information organization, associative encoding, and knowledge retrieval.

The methodological framework was informed by cognitive learning theories, particularly the principles of meaningful learning, information processing, and the active construction of knowledge.

3. RESULTS

The theoretical analysis revealed that mnemonic technologies have considerable didactic potential for developing the cognitive competence of future preschool education teachers. Their effectiveness is associated with the purposeful organization of educational information and the establishment of meaningful connections between concepts.

Five principal didactic functions of mnemonic technologies were identified.

1. Facilitating information perception.

Visual representations, symbols, diagrams, and graphic models help students recognize the

structure of educational information. The use of visual materials makes abstract pedagogical concepts more accessible and supports the initial stages of knowledge acquisition.

2. Strengthening associative thinking.

Associative techniques enable students to connect new information with previously acquired knowledge. This approach contributes to the development of cognitive flexibility and the ability to establish relationships between different pedagogical concepts.

3. Improving information systematization.

Mind maps, semantic clusters, classification tables, and mnemonic schemes allow students to organize educational materials into logically interconnected units. Such techniques are particularly useful when studying pedagogical theories, preschool development principles, and educational methodologies.

4. Supporting long-term retention and retrieval.

Mnemonic coding and meaningful associations provide additional reference points for recalling previously learned information. The combination of verbal, visual, and semantic representations can facilitate the retrieval of educational content.

5. Developing independent learning skills.

The purposeful application of mnemonic strategies encourages students to select appropriate learning techniques, organize their own educational activities, and evaluate the effectiveness of their learning processes.

Table 1. Didactic functions of mnemonic technologies in developing cognitive competence

Mnemonic echnique	**Didactic function**	**Expected cognitive outcome**
Visualization	Representing information raphically	Improved perception and omprehension
Association	Establishing semantic connections	Development of associative thinking
Mind mapping	Structuring educational information	Logical organization of knowledge

Symbolic coding	Encoding concepts through symbols	Improved information retrieval
Semantic grouping	Combining related concepts	Systematic knowledge acquisition
Mnemonic torytelling	Connecting concepts through arratives	Meaningful memorization and eproduction

The analysis also indicates that mnemonic technologies should be integrated into the educational process gradually and systematically. Their use should correspond to the complexity of the learning material, students' individual cognitive characteristics, and the intended learning outcomes.

A methodological sequence for integrating mnemonic technologies

The following sequence can be proposed for their implementation in the professional training of future preschool education teachers:

1. **Diagnostic stage:** identifying students' existing knowledge, learning strategies, and individual approaches to information processing.
2. **Cognitive activation stage:** introducing associative questions, visual prompts, and problem-based learning tasks.
3. **Mnemonic organization stage:** applying mind maps, symbolic coding, semantic grouping, and mnemonic models.
4. **Application stage:** using mnemonic representations to analyse pedagogical situations and solve professional tasks.
5. **Reflection and evaluation stage:** assessing knowledge retention, comprehension, independent application, and the effectiveness of selected mnemonic strategies.

This sequence establishes a connection between information acquisition and its practical application in professional pedagogical activities.

4. DISCUSSION

The findings demonstrate that mnemonic technologies should be considered not merely as memory-enhancement techniques but as a broader didactic resource for organizing cognitive activity.

Traditional memorization often focuses on reproducing educational information, whereas mnemonic learning strategies emphasize the establishment of semantic relationships, active processing, and meaningful knowledge construction.

This distinction is particularly important in the preparation of future preschool education teachers. Their professional responsibilities require the ability to interpret educational information, understand children's developmental needs, select appropriate teaching methods, and make pedagogically justified decisions.

The proposed approach is consistent with the cognitive perspective of learning, according to which knowledge acquisition involves the active processing and organization of information. Baddeley (1997) highlights the role of working memory in the temporary storage and processing of information. This provides a theoretical explanation for the importance of organizing learning materials into meaningful and manageable units.

Similarly, Mayer (2009) demonstrates the importance of combining verbal and visual representations in meaningful learning. These principles support the educational application of visual mnemonic schemes, diagrams, and associative models.

Dunlosky et al. (2013) also emphasize the importance of evidence-based learning strategies, particularly practice testing and distributed practice. Consequently, mnemonic techniques can be made more effective when combined with repeated retrieval, self-assessment, and systematic revision.

From the perspective of professional pedagogical preparation, the development of cognitive competence should be connected with the formation of professional knowledge and practical skills. As indicated by Tairova (2024), the development of future preschool teachers' professional pedagogical competence requires purposeful pedagogical organization. In this context, mnemonic technologies can serve as supplementary didactic instruments for strengthening the cognitive foundations of professional readiness.

It is important to emphasize that mnemonic techniques do not automatically guarantee deep understanding or professional competence. Their effectiveness depends on the quality

of instructional design, the meaningfulness of the associations created, students' active participation, and the connection between theoretical knowledge and pedagogical practice.

Therefore, the integration of mnemonic technologies should be based on a combination of cognitive, competency-based, activity-oriented, and learner-centred approaches.

5. CONCLUSION

The study establishes that mnemonic technologies possess significant didactic potential for enhancing the cognitive competence of future preschool education teachers.

Their systematic application can support the development of information perception, associative thinking, logical organization, memory, knowledge retrieval, and independent learning skills.

The findings suggest that mnemonic technologies should be incorporated into higher education not as isolated memorization techniques but as an integrated component of the teaching and learning process.

The proposed methodological sequence, comprising diagnostic, cognitive activation, mnemonic organization, application, and reflection stages, provides a conceptual framework for their implementation in preschool teacher education programmes.

Ultimately, the purposeful integration of mnemonic technologies can contribute to improving the cognitive foundations of professional preparation and supporting the development of future preschool education teachers as reflective, independent, and competent professionals.

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