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FORMATION OF SCIENTIFIC THINKING OF A YOUNG RESEARCHER — FUTURE ENGLISH TEACHER AS AN IMPORTANT CONDITION FOR HIS METHODOLOGICAL MATURITY AND PEDAGOGICAL MASTERY

Abstract. The article is devoted to the problem of formation of scientific thinking of a young researcher — future English teacher as an important condition for their methodological maturity and pedagogical mastery. In the context of globalization and Ukraine's integration into the European educational space, the role of foreign language as a means of intercultural communication is increasing. Accordingly, the requirements for the professional training of future English teachers are rising. One of the key competencies that ensures methodological maturity and pedagogical mastery is scientific thinking. This competence enables teachers to not only apply current methods but also to independently analyze educational issues, develop innovative approaches, and adapt educational material to students' needs.

However, in the training of future teachers, insufficient attention is often paid to the development of research skills, which complicates their professional growth in a dynamic educational environment. The aim of this research is to provide a theoretical basis for the formation of scientific thinking and to develop practical methods for its cultivation among future English teachers. The research methods included theoretical analysis of scientific and methodological literature in pedagogy, psychology, and foreign language teaching methodology, as well as systematization and generalization of data. The results show that systematic work on developing scientific thinking in future philology teachers, in particular through engagement in project activities and research seminars, contributes to enhancing their professional competence, ability for self-analysis, and innovative pedagogical activity. This is an essential prerequisite for their methodological maturity and pedagogical mastery. Scientific thinking forms a fundamental basis for the continuous professional growth of a teacher.

Keywords: scientific thinking, future English teacher, methodological maturity, pedagogical mastery, professional training, concept of teacher professionalism, practical strategies, methodological approaches.

ФОРМУВАННЯ НАУКОВОГО МИСЛЕННЯ МОЛОДОГО ДОСЛІДНИКА-МАЙБУТНЬОГО ВЧИТЕЛЯ АНГЛІЙСЬКОЇ МОВИ ЯК ВАЖЛИВОЇ УМОВИ ЙОГО МЕТОДИЧНОЇ ЗРІЛОСТІ ТА ПЕДАГОГІЧНОЇ МАЙСТЕРНОСТІ

Анотація. Стаття присвячена проблемі формування наукового мислення молодого дослідника-майбутнього вчителя англійської мови як важливої умови його методичної зрілості та педагогічної майстерності. За сучасних умов глобалізації та інтеграції України до європейського освітнього простору зростає роль іноземної мови як засобу міжкультурної комунікації. Відповідно підвищуються вимоги до професійної підготовки майбутнього вчителя англійської мови. Однією з ключових компетенцій, що забезпечує його методичну зрілість і педагогічну майстерність, є наукове мислення. Воно дає змогу не лише ефективно засвоювати чинні методики, а й самостійно аналізувати педагогічні ситуації, розробляти інноваційні підходи й адаптувати навчальний матеріал до потреб учнів. Однак у підготовці майбутніх педагогів часто недостатньо уваги приділяється формуванню саме дослідницьких навичок, що ускладнює їхній професійний розвиток у динамічному освітньому середовищі. Мета дослідження полягає в теоретичному обґрунтуванні та розробці методичних засад формування наукового мислення в майбутніх учителів англійської мови. Методи дослідження включали теоретичний аналіз науково-методичної літератури з педагогіки, психології та методики викладання іноземних мов, систематизацію та узагальнення даних. Результати дослідження показують, що систематична робота з розвитку наукового мислення майбутніх педагогів-філологів, зокрема через залучення до проектної діяльності та науково-дослідних семінарів, сприяє значному підвищенню їхньої професійної компетенції, здатності до самоаналізу та інноваційної педагогічної діяльності. Це є важливою передумовою їхньої методичної зрілості та педагогічної майстерності. Наукове мислення є фундаментальною основою для постійного професійного зростання вчителя.

Ключові слова: наукове мислення, майбутній учитель англійської мови, методична зрілість, педагогічна майстерність, професійна підготовка, концепція професіоналізму вчителя, практичні стратегії, методологічні підходи.

INTRODUCTION

The problem formulation. Modern education, particularly the teaching of foreign languages, places high demands on the professionalism of educators. A teacher is expected to have not only a solid grasp of the language and methodology but also the ability for creative inquiry, innovative activity, and critical analysis. In this context, scientific thinking becomes not just a desired quality but a necessary one for a future teacher. It allows an educator to move away from a reproductive approach to teaching and transition to research and project work, as well as to constantly improve their own professional practice. Despite this, the process of training a teacher-philologist in higher education institutions gives insufficient attention to the development of these very research skills, which can lead to formulaic teaching in the future.

The problem of training future teachers is the subject of research by many domestic and foreign scholars. Specifically, the issue of a teacher's professional competence has been explored by such well-known academics as I. Bekh, L. Kalyuzhna, O. Savchenko, and others. The importance of developing research competence has been studied by O. Voznyuk, N. Yevtukh, and O. Krylenko, who emphasized the need to integrate science into the educational process.



However, despite these thorough works, the issue of forming scientific thinking specifically in the context of training a future English teacher as a condition for their methodological maturity remains insufficiently studied and requires further analysis.

THE AIM AND RESEARCH TASKS

The aim of this article is to investigate the critical role of developing scientific thinking in young researcher-future English teachers as a foundational element for achieving methodological maturity and advanced pedagogical skill.

To achieve this aim, the following tasks are set:

- To define the key components of scientific thinking relevant to foreign language pedagogy within teacher education.
- To analyze how existing frameworks for teacher professionalism and effective professional development can be leveraged to explicitly cultivate scientific thinking during teacher education.
- To propose practical strategies and pedagogical approaches for integrating scientific inquiry and evidence-informed practice into the training of future English teachers.
- To recommend areas for further research and policy development to enhance the formation of scientific thinking in teacher education programs, particularly for foreign language teachers.

RESEARCH METHODS

To achieve the research aim and tasks, a combination of theoretical methods was used: analysis, synthesis, and generalization for studying philosophical, psycho-pedagogical, and scientific-methodological literature and to define key concepts. Systematization was used to structure theoretical material and identify the main research directions.

RESULTS OF THE RESEARCH

Recent research underscores the critical need for enhancing teacher professionalism and the role of effective professional development in achieving this. Anita Mezza's OECD Education Working Paper No. 276, "Reinforcing and innovating teacher professionalism: Learning from other professions", maps teaching's position in the changing landscape of professions using a cross-sectoral approach. Historically, teaching has been classified as a "semi-profession" (Mezza, 2022, p.7). However, contemporary research points to the need for strengthening teacher professionalism through a focus on career progression, specialisation, autonomy, and status. The paper posits that teaching is well-positioned to innovate professionalism by embracing collaboration, continuing professional learning, and engagement with research. A proposed conceptual framework for professionalism encompasses cognitive, social/legal, and ethical spheres (Mezza, 2022, p. 10).

The OECD's Teaching and Learning International Survey (TALIS) 2018 identified five pillars of teacher professionalism: a shared and specialized knowledge and skills base, professional expertise, professional exchange, commitment to high standards, and appropriate working conditions and regulations (Teaching, 2018, p. 21). Similarly, "The Future of Teachers and Teaching" highlighted individual and collective elements, including professional knowledge and competences, a commitment to high standards and lifelong learning, professional exchange, collaboration, identity, and supportive working conditions (Griffin, 1988, p. 21).

The report "Effective Teacher Professional Development" defines effective PD as structured professional learning that leads to changes in teacher practices and improved student learning outcomes (Darling-Hammond, 2017, p. 2). This report identifies seven widely shared features of effective professional development: it is content-focused, incorporates active learning, engages teachers in collaboration, uses models and/or modeling, provides coaching and expert support, includes time for feedback and reflection, and is of sustained duration. Content-focused PD, for instance, supports teacher learning within specific classroom contexts by concentrating on discipline-specific curriculum and pedagogies. Crucially, content-focused PD is more effective when it links content learning to pedagogies that support students and practice. Active learning encourages teachers to design and test teaching strategies, moving beyond traditional lecture-based models. Collaboration allows teachers to collectively reflect on challenges and improve instructional practices, often through examining student work and data (Darling-Hammond, 2017, p. 9).

Continuing professional learning and engagement with research are also emphasized as avenues for teaching to innovate professional development through educational sciences. Direct engagement with research, from individual use of academic literature to large-scale collaborations, is seen as vital for developing democratic teacher professionalism and innovation (Darling-Hammond, 2017, p. 31).

In the context of foreign language pedagogy, the guide by Nikolaieva et al. provides a framework for master's students (Николаєва, 2019, p. 1-2). It aims to cultivate professional-methodological competence in future foreign language teachers, aligned with pan-European recommendations, such as the Common European Framework of Reference for Languages (CEFR) (Council, 2001, p. 9). The curriculum includes developing general competencies like abstract thinking, analysis, synthesis, information processing, and use of ICT, alongside professional competencies such as planning educational processes, selecting modern teaching methods, analyzing professional activities, fostering independent learning, and applying innovative approaches. The importance of linguistic knowledge (lexical, phonetic, grammatical) for future teachers is also highlighted (Council, 2001, p. 41).

Education systems globally face significant challenges in attracting and retaining excellent teachers (Kravchenko, 2018). Strengthening teacher professionalism, by deriving insights from other sectors, offers a promising approach to confronting these issues. The contemporary educational landscape demands sophisticated forms of teaching to develop 21st-century student competencies, such as deep mastery of challenging content, critical thinking, complex problem-solving, effective



communication, collaboration, and self-direction. To achieve this, effective professional development (PD) is crucial to help teachers learn and refine the pedagogies required to impart these skills (Kravchenko, 2018).

For future English teachers, the need for methodological maturity and pedagogical skill is paramount. This goes beyond merely applying pre-defined teaching techniques; it requires a capacity for continuous professional learning, engagement with research, and critical reflection to adapt to evolving educational needs. The concept of "public professionalism" emphasizes defining a shared understanding of what teachers offer, shaping collective action beyond individual classroom efforts (Nikolaieva, 2019, p. 16). Furthermore, "professional conduct," entailing a commitment to high standards and ethical behavior, plays a vital role in the perception and practice of the profession. Teachers are expected to base their judgments, actions, and work-related decisions on a specialized, systematized, and scientific body of knowledge and shared professional values. This implicitly highlights the necessity of scientific thinking, which enables future educators to critically analyze, innovate, and contribute to the advancement of pedagogical practice.

While extensive research addresses teacher professionalism and effective professional development, the explicit formation of scientific thinking in young researcher-future English teachers as a direct condition for their methodological maturity and pedagogical skill remains an area requiring more focused investigation. The sources acknowledge the necessity for teachers to engage with research and base their decisions on scientific knowledge (Mezza, 2022, p. 31), yet concrete strategies for cultivating a scientific mindset (beyond general research literacy) during initial teacher training are not fully elaborated.

The "Effective Teacher Professional Development" report points out its scope limitations, noting that it does not delve into why specific professional development programs fail or what elements of unsuccessful models might reveal. This highlights a broader gap in understanding the precise mechanisms that hinder the development of desired teacher attributes, including scientific thinking.

The challenge lies in transitioning from merely "knowing about research" to actively "thinking scientifically", that is, systematically applying inquiry, critical analysis, and evidence-based reasoning to pedagogical issues. How can initial teacher education effectively foster a deep scientific inquiry and critical reflection in future teachers, ensuring that theoretical pedagogical knowledge is seamlessly integrated with practical application in dynamic classroom settings. Bridging this gap is crucial for empowering future educators to not only implement best practices but also to innovate, adapt, and solve complex professional-methodological problems independently.

The challenges facing education systems, notably attracting and retaining excellent teachers, necessitate a reinforced and innovative approach to teacher professionalism (Darling-Hammond, 2017, p. 21). This paper argues that the deliberate formation of scientific thinking in young researcher-future English teachers is a crucial, though often implicit, component of their "professional knowledge and competences" and "engagement with research" (Mezza, 2022, p. 31).

Scientific thinking, in the context of foreign language pedagogy, encompasses several key components that are essential for methodological maturity and pedagogical skill: 1) knowledge base and critical understanding, 2) problem identification and resolution, 3) evidence-informed practice and inquiry, 4) reflective practice and self-correction. The following is a short elaboration of these key components.

1) Knowledge base and critical understanding involves possessing a deep understanding of a specialized, systematized, and scientific body of knowledge in foreign language teaching methodology, including theoretical foundations (Mezza, 2022, p. 14). It extends to the ability to think abstractly, analyze, synthesize, generalize, and evaluate problems within foreign language teaching and literature.

2) Problem identification and resolution are the gist of scientific thinking that equips future teachers with the capacity to identify professional problems, formulate solutions, and take responsibility for their implementation. This involves interpreting instructions and real-world pedagogical situations from one's own informed professional perspective (Mezza, 2022, p. 36).

3) A core aspect is the ability to use academic literature and research findings to inform teaching practices. It promotes active engagement with research as a means of innovation, valuing continuous, even small-scale, improvements, and linking content knowledge with effective pedagogies. Teachers become leaders of innovation through an inquiry-driven approach (Mezza, 2022, p. 31).

4) Scientific thinking necessitates critical self-reflection on one's own teaching practice, as well as on broader educational phenomena. This includes analyzing one's learning processes and confronting "unwelcome truths" alongside successes to foster real professional development (Mezza, 2022, p. 36).

The cultivation of scientific thinking can be strategically integrated into initial teacher education through effective professional development models and specific pedagogical approaches: a) effective professional development (PD) elements; b) content focus; c) active learning and collaboration; d) coaching and expert support; e) engagement with research; f) initial teacher education (ITE) curriculum. Here's a quick breakdown of the main parts.

The identified features of effective PD-content focus, active learning, collaboration, use of models, coaching, feedback/reflection, and sustained duration – provide a robust framework. For future English teachers, this means PD centered on methodological content and pedagogical sciences for language acquisition. This includes the theoretical basis for teaching lexical, phonetic, and grammatical competencies (Nikolaieva, 2019, p. 23-24). Future teachers should be actively involved in designing, implementing, and critically analyzing teaching strategies. This can involve collaboratively analyzing student work, discussing pedagogical challenges, and developing lesson plans informed by research. Collaborative problem-solving, as seen in content-based collaborative inquiry sessions, can significantly impact teacher practice and student achievement (Council, 2001, p. 177). University faculty and experienced methodologists can provide expert guidance,



modeling research-informed practices, and offering constructive feedback as future teachers experiment with new approaches (Council, 2001, p. 181). This mentorship helps bridge theory and practice. Explicitly integrating research into teacher training programs, encouraging future teachers to not only consume but also contribute to educational research. This contributes to their methodological maturity and can lead to enhanced professional status and career specialization: emphasize the professional orientation of forming linguistic and communicative competencies, ensuring that pedagogical choices are justified by scientific principles and develop students' abilities to select and critically evaluate modern methods, technologies, and assessment tools (Griffin, 1988, p. 79); foster learner autonomy by teaching self-education and self-development strategies (Mezza, 2022, p. 16). This includes reflecting on one's own learning processes and understanding learning strategies.

Utilize publications like the CEFR as a transparent and coherent basis for curriculum development and assessment, encouraging a deep, evidence-based understanding of language proficiency (Council, 2001, p. 28).

The deliberate cultivation of scientific thinking in future English teachers underpins their ability to achieve profound methodological maturity and sophisticated pedagogical skill.

Scientific thinking enables teachers to transcend the mere application of techniques to engage in innovative problem-solving within complex and non-standard pedagogical situations (Nikolaieva, 2019, p. 10). This means they can critically analyze and generalize teaching experiences, plan and creatively construct the entire educational process, and introduce methodologically sound adjustments to achieve desired results. It fosters a critical stance towards teaching materials and methods, allowing for informed adaptation to diverse student needs and contexts.

Pedagogical Skill as an analytical approach ensures that pedagogical decisions are evidence-based, leading to the effective application of diverse methods, forms, and technical tools for developing students' professional-oriented communicative competence. By actively connecting theoretical knowledge with practical application through inquiry-based learning, future teachers develop a deeper understanding of why certain pedagogies are effective, rather than merely what practices to employ. This fosters proactive engagement with the evolving nature of the teaching profession, allowing them to lead discussions on teacher professionalism and innovate at the local level.

CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCH

Further research is essential to deepen the understanding and optimize the formation of scientific thinking in future English teachers. This includes: developing and evaluating explicit models for embedding scientific inquiry, critical pedagogy, and evidence-informed practice into pre-service foreign language teacher education programs; comparative research on the long-term effects of different pedagogical approaches during initial training on teachers' capacity for scientific thinking, methodological innovation, and career progression; investigating the specific impact of interventions designed to foster scientific thinking on teacher effectiveness, student learning outcomes, and teacher retention rates, particularly for early-career teachers; exploring strategies to overcome barriers to effective professional development and scientific thinking, such as inadequate foundational knowledge, challenges in implementation fidelity, and unsupportive school cultures; increasing the availability of empirical data reflective of teacher professionalism and scientific thinking at different educational levels to inform policy and practice.

By focusing on these areas, we can ensure that future English teachers are not only skilled practitioners but also reflective researchers, capable of leading pedagogical innovation and fostering a culture of continuous improvement in language education.

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