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ДИНАМІКА ЗНАТЬ ЯК РУШІЙНА СИЛА ПРОФЕСІЙНОГО СТАНОВЛЕННЯ МАЙБУТНІХ СПЕЦІАЛІСТІВ З МЕДСЕСТРИНСТВА

У дослідженні підкреслюється ключова роль доказової медицини у формуванні динаміки знань. Динаміка знань є фундаментальним епістемологічним та педагогічним принципом у сучасній підготовці майбутніх медсестер.

Актуальність розвідки динаміки знань в сестринській освіті зумовлена структурними змінами, що відбуваються в системі охорони здоров'я та освіти. Метою дослідження є теоретичне обґрунтування та методологічна розробка концепції «динаміки знань» у процесі навчання медсестер.

У статті використовується комбінація теоретичних методів дослідження для вивчення динаміки знань в сестринській освіті. Теоретичні методи включають аналіз, синтез, порівняння та систематизацію наукової літератури для визначення концептуальних основ динаміки знань.

Особлива увага приділяється переходу від традиційних моделей передачі знань до адаптивних, орієнтованих на студента, тобто спільних та технологічно вдосконалених освітніх парадигм, котрі сприяють безперервному професійному розвитку та інтелектуальній гнучкості. Дослідження синтезує сучасні міждисциплінарні наукові підходи до розуміння динаміки знань як багатовимірного процесу, що включає набуття знань, їх трансформацію, обмін, спільне конструювання та практичне застосування у складних професійних середовищах. На основі аналізу сучасної наукової літератури у статті визначено основні структурні компоненти динаміки знань в освіті медсестер, включаючи самостійне та саморегульоване навчання, спільне створення знань, рефлексивні та метакогнітивні практики, цифрові мережі знань, міждисциплінарну інтеграцію та трансформаційну підготовку на основі компетентностей. Особливий акцент на педагогічній ролі онлайн-екосистем знань, спільних репрезентацій, інструментів дзеркалювання та розширених навчальних середовищ як механізмів, котрі сприяють колективному пізнанню, професійній рефлексії та організаційному навчанню. Ці підходи сприяють розвитку критичного мислення, адаптивної експертизи, комунікативної компетентності та прийняття клінічних рішень

на основі доказів серед майбутніх медсестер. Таким чином, динаміку знань слід розглядати як стратегічну педагогічну основу для сучасної медсестринської освіти, що забезпечує методологічні основи для розробки гнучких, інтегративних та практично орієнтованих моделей підготовки медсестер, здатних реагувати на мінливі потреби сучасної системи охорони здоров'я.

Ключові слова: динаміка знань; освіта медсестер; доказова медицина; клінічне мислення; компетенції прийняття рішень; цифрові технології в освіті; навчання на основі симуляції; розвиток компетенцій; навчання протягом усього життя; підготовка медичних працівників.

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KNOWLEDGE DYNAMICS AS A DRIVER OF PROFESSIONAL FORMATION IN FUTURE NURSING SPECIALISTS

The study highlights the pivotal role of evidence-based medicine in shaping knowledge dynamics. Knowledge dynamics represent a fundamental epistemological and pedagogical principle in the contemporary training of future nurses. The relevance of investigating knowledge dynamics in nursing education is caused by structural changes occurring in global healthcare and educational system.

The aim of this research is to theoretically substantiate and methodologically develop the concept of ‘knowledge dynamics’ in the training process of nurses.

The study employs a combination of theoretical research methods to investigate knowledge dynamics in nursing education. Theoretical methods include analysis, synthesis, comparison, and systematization of scientific literature to define conceptual foundations of knowledge dynamics.

Particular attention is devoted to the shift from traditional knowledge transmission models toward adaptive, learner-centered, collaborative, and technology-enhanced educational paradigms that foster continuous professional development and intellectual flexibility. The study synthesizes contemporary interdisciplinary scholarly approaches to understanding knowledge dynamics as a multidimensional process involving knowledge acquisition, transformation,

exchange, co-construction, and practical application in complex professional environments. Based on an analysis of current scientific literature, the article identifies the principal structural components of knowledge dynamics in nursing education, including independent and self-regulated learning, collaborative knowledge creation, reflective and metacognitive practices, digital knowledge networking, interdisciplinary integration, and transformative competency-based learning. Special emphasis is placed on the pedagogical role of online knowledge ecosystems, shared representations, mirroring tools, and expansive learning environments as mechanisms that facilitate collective cognition, professional reflection, and organizational learning. These approaches contribute to the development of critical thinking, adaptive expertise, communicative competence, and evidence-informed clinical decision-making among future nursing professionals. Thus, knowledge dynamics should be regarded as a strategic pedagogical framework for modern nursing education, providing methodological foundations for the design of flexible, integrative, and practice-oriented models of nurse preparation capable of responding to the evolving demands of contemporary healthcare systems.

Key words: knowledge dynamics; nursing education; evidence-based medicine; clinical reasoning; decision-making competencies; digital technologies in education; simulation-based learning; competency development; lifelong learning; healthcare professional training.

Introduction. The contemporary renovation of healthcare systems, driven by rapid technological advancement, globalization, and the increasing complexity of patient care, necessitates a fundamental rethinking of how professional knowledge is created, conducted and applied in nursing education. Within this context, the concept of knowledge dynamics is considered to be constant, nonlinear processes of knowledge generation, integration, adaptation and renewal emerging as a central paradigm in the training of future nurses. Unlike traditional static models of knowledge acquisition, knowledge dynamics emphasize the interconnection between theoretical learning, clinical practice, digital environments and collaborative professional interactions.

Nursing, as both a science and a practice-oriented specialty, requires not only the assimilation of evidence-based knowledge but also the capacity for creation, critical reflection, rapid decision-making and context-sensitive application. The expansion of digital health technologies, simulation-based learning environments and interdisciplinary collaboration has significantly altered the epistemological foundations of nursing education. Knowledge is no longer confined to institutional curricula; instead, it is distributed across networks, always updated, and co-constructed by learners, educators, and clinical practitioners.

Moreover, the shift toward patient-centered care, personalized medicine and culturally competent practice underscores the necessity for adaptive knowledge systems that can respond to diverse clinical circumstances. In this regard, knowledge dynamics serve as a theoretical and methodological framework that enables the integration of formal education, informal learning and experiential knowledge. It also aligns with competency-based education models, where learning results are defined not merely by knowledge maintenance but by the ability to apply, transform and innovate within professional medical contexts.

Relevance of the Problem. The relevance of investigating knowledge dynamics in nursing education is caused by structural changes occurring both in healthcare and educational systems.

First, the exponential growth of medical information and the accelerating pace of scientific discovery render traditional models of knowledge transmission insufficient. Nurses are required to continuously update their competencies, navigate vast information and critically evaluate diverse sources of clinical evidence. This creates an urgent need for

educational approaches that prioritize knowledge adaptability rather than mere accumulation.

Second, the integration of digital technologies including electronic health records, telemedicine, artificial intelligence and virtual simulation has transformed both clinical practice and learning environments. These innovations demand new forms of digital literacy and the ability to operate within complex, technology-mediated knowledge ecosystems. Consequently, knowledge dynamics become essential for understanding how nurses interact with, interpret and apply digitally mediated information in real time.

Third, contemporary healthcare increasingly relies on interdisciplinary collaboration, where effective communication and knowledge exchange between professionals from different fields are critical for patient outcomes. In such settings, knowledge is co-created and negotiated, highlighting the significance of dynamic, network-based learning processes in nursing education.

Moreover, the challenges posed by global health crises, as wars, pandemics, humanitarian emergencies and the ongoing transformation of healthcare systems, further amplify the necessity for flexible and resilient knowledge systems. So, nurses must be prepared to function in rapidly changing and often unpredictable environments, where the ability to adapt knowledge to new contexts is crucial.

Finally, the shift toward competency-based and student-centered education models reinforces the importance of knowledge dynamics as a conceptual foundation for curriculum design, pedagogical strategies and assessment practices. Understanding these dynamics enables educators to create learning environments that support self-directed learning, critical thinking and professional identity formation.

Thus, the study of knowledge dynamics in the training of nurses is not only theoretically significant but also practically imperative. It reports persistent necessity to align nursing education with the realities of contemporary healthcare, ensuring that future professionals are equipped with the cognitive, technological and social competencies required for effective and ethical care.

The **aim** of this research is to theoretically substantiate and methodologically develop the concept of 'knowledge dynamics' in the training process of nurses as well as to determine its impact on the formation of professional competencies and experience for effective practice in contemporary healthcare environment.

RESEARCH TASKS

1. To conceptualize the essence of knowledge dynamics in nursing education, clarifying its key components, characteristics and pedagogical principles within the context of modern healthcare transformation.

2. To determine the pedagogical conditions and mechanisms that ensure the effective implementation of knowledge dynamics in the educational process, including digital technologies, simulation-based learning, interdisciplinary interaction and reflective practice.

3. To develop a conceptual model of knowledge dynamics in nurse training and justify its potential for enhancing professional competence, critical thinking, adaptability, and lifelong learning skills among future nursing professionals.

The study employs a combination of **theoretical research methods** to investigate knowledge dynamics in nursing education: analysis, synthesis, comparison, and systematization of scientific literature to define conceptual foundations of knowledge dynamics.

Literature review. Existing studies demonstrate that effective knowledge acquisition is no longer limited to transmissive instructional models, but increasingly relies on collaborative, reflective, and context-sensitive educational practices that foster adaptability and critical thinking. Researchers also highlight the growing importance of learner autonomy, experiential engagement, and network-based knowledge exchange as essential mechanisms for developing professional competencies in complex and rapidly evolving fields: Bratianu C. and Bejinaru R. develop the theory of knowledge fields as a thermodynamic approach; Selingo J. studies the future of higher education and what it means for students; Bower M. investigates teaching as a design science: building pedagogical patterns for learning and technology; Bell S. determines project-based learning for the 21st century: skills for the future; Muhie Y.A., Woldie A.B. explore integration of artificial intelligence technologies in teaching and learning in higher education; Bratianu C., Vătămănescu E., Anagnoste S., Dominici G. investigate untangling knowledge fields and knowledge dynamics within the decision-making process; Bratianu C. Mark organizational knowledge dynamics: managing knowledge creation, acquisition, sharing, and transformation; Bratianu C. and Vatamanescu E.M. determine the impact of the entropic knowledge dynamics in the decision-making process and the influence of knowledge dynamics on the managerial decision-making process.

Discussion. Recent scholarly discourse highlights contemporary professional education which is increasingly shaped by dynamic knowledge systems integrating interdisciplinary learning, digital innovation, and competency-based pedagogical frameworks. It means that knowledge dynamics constitute a fundamental characteristic of contemporary nursing education, reflecting a shift from static knowledge transmission toward adaptive, learner-centered, and practice-oriented models as “knowledge dynamics’ is a basic process of any organizational knowledge spectrum, including organizational spirituality” [2; 3]. Thus, effective training of future nurses depends on

the integration of cognitive, social, and technological approaches which collectively facilitate the continuous transformation of knowledge.

We also support the idea examining by the researchers Elena-Mădălina Vătămănescu, Constantin Brătianu, Dan-Cristian Dabija, and Sebastian Popa [10] how online knowledge networks facilitate the transition from individual knowledge acquisition to broader organizational achievements and innovation capacity. The authors argue that digital networking environments improve access to diverse expertise, accelerate knowledge interchange and create conditions for collaborative learning across institutional borders. Particular emphasis is placed on the mechanisms through which individually acquired knowledge becomes transformed into collective intellectual capital, strengthening organizational adaptability and strategic performance. So, we suggest that the effective capitalization of online knowledge networks serves as a catalyst for ‘knowledge dynamics’ including organizational learning, innovation, and sustainable competitive development for future nurses.

Jakubik’s study [5] is also important for nurses’ education in which the author examines collaborative knowledge creation as a dynamic social and cognitive process that emerges through interaction, dialogue, and shared meaning-making within organizations. Knowledge creation is not merely the transfer of existing information, but an experiential process shaped by reflection, communication and collective engagement. Particular attention is given to the role of organizational culture, trust and interpersonal relationships in fostering environments conducive to collaborative learning and innovations. The article contributes to knowledge management theory by conceptualizing collaborative knowledge creation as an evolving and context-dependent phenomenon embedded in everyday organizational practices. Thus, sustainable organizational learning depends on the capacity of students and even groups to co-create knowledge through continuous collaboration and experiential exchange.

The results of scientists Hannele Toiviainen, Sanna Toikka, and Jarmo Lallimo [9] should be considered in the same context where they investigate expansive learning as a transformative process that emerges through collective problem-solving within complex, multilayered design projects. Learning extends beyond the acquisition of predefined knowledge, involving the creation of new practices, shared conceptual frameworks and innovative modes of collaboration among students. The authors analyze how interactions across multiple organizational, social and epistemic approaches stimulate reflection, negotiation and the redefinition of goals within collaborative activity. Particular attention is given to the dynamic interaction between tools, participants and contextual conditions that shape knowledge creation and organizational development and expansive learning which serves as a mechanism for collective innovation, adaptive transformation, and the co-construction of new forms of knowledge or practice.

As the author (Saba Qadhi) [6] states, “knowledge dynamics inherently implies the presence

of motion, development, and transformation within the knowledge domain.” It means that the development of critical thinking and metacognitive skills emerges as a key factor in enabling students to actively construct and reconstruct professional knowledge, mainly “collaboratively, in long- term processes, they develop novel epistemic things and transform their knowledge practices, specifically by cross-fertilizing professional and educational practices and solve complex, authentic problems with the help of innovative knowledge practices and educational technology” [4].

We share the idea by Richter and colleagues [7] in which they explore the pedagogical and technological potential of mirroring tools as instruments for supporting collaborative analysis and reflective learning processes. Particular emphasis is stressed on how reflective visualization of group dynamics can enhance metacognitive awareness, improve communication and stimulate deeper collective inquiry. The authors demonstrate that mirroring tools function not only as technological supports but also as mediational mechanisms that foster self- regulation and shared understanding within collaborative environments. Overall, the work contributes to the field of technology-enhanced learning by highlighting the importance of reflective analytics in strengthening collaborative knowledge creation and collective learning outcomes which constitute knowledge dynamics.

Suthers [8] also investigates collaborative knowledge construction through the use of shared representations, emphasizing how visual and symbolic artifacts mediate group cognition. The author argues that knowledge construction is not solely an internal cognitive process but is distributed across students, tools and representational media. Generally, the research provides important insights into how technology-enhanced environments can facilitate deeper collaborative learning through the strategic use of shared representations.

Collectively, this body of literature suggests that modern educational paradigms in nursing training should be oriented toward flexible, integrative and transformative approaches supporting both individual professional growth and broader organizational development.

On the basis of research analysis one can compile the main constituents of ‘knowledge dynamics’ as on the Fig. 1.

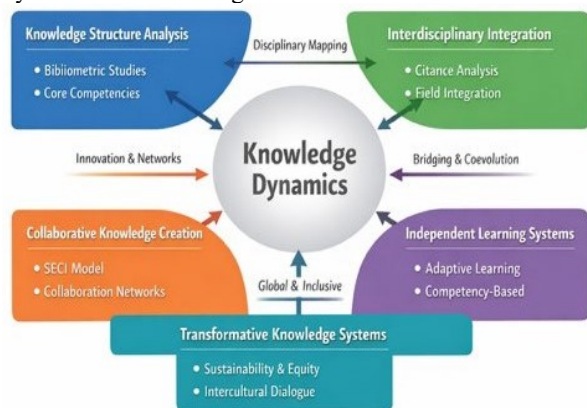


Fig. 1. The main approaches of ‘knowledge dynamics’

Overall, ‘knowledge dynamics’ should be considered to be a central organizing principle in the strategy of nursing education. As proved by the authors [10], individual motivation to acquire knowledge has a significant influence on the affiliation with online academic networks approached as online knowledge networks. Further, active engagement with the network intangible resources leads to a significant harnessing of the three-component intellectual capital, that is, human, structural and relational capital. The transition toward dynamic knowledge systems not only enhances learning outcomes but also ensures the formation of flexible, resilient and competent professionals capable of lifelong learning and effective practice in modern healthcare systems.

Conclusions. The analysis of contemporary pedagogical discourse proves that knowledge dynamics has developed as a foundational construct in modern nursing education redefining traditional models of professional training through adaptive, collaborative and transformational learning processes. Unlike conventional approaches focused on the transmission of fixed disciplinary knowledge, dynamic knowledge systems emphasize continuous knowledge generation, reinterpretation and application within complex professional contexts. This shift positions future nurses not merely as recipients of information but as active participants in knowledge creation, reflective practice and interdisciplinary problem-solving.

The efficacy of nursing education increasingly depends on the integration of cognitive, social, organizational and technological approaches. Digital knowledge nets, collaborative learning environments, reflective analytics, shared representational tools and expansive learning models create pedagogical ecosystems in which professional knowledge is constantly constructed, exchanged and transformed into combined intellectual practical capital. Such environments strengthen critical thinking, metacognitive regulation, communicative competence and adaptive expertise. All these competencies are essential for nursing practice in rapidly changing healthcare systems.

Furthermore, the scientific literature highlights that sustainable professional development in nursing is strongly trained by relational trust, collaborative culture, reflective dialogue and technology-mediated interaction, all of which serve as mechanisms for deep knowledge exchange and collective innovations. The dynamic relationship between individual cognition and socially distributed learning practices contributes to the emergence of new professional senses, enhanced organizational learning and improved healthcare responsibility.

Therefore, the conceptualization of knowledge dynamics in nursing education should be understood as a multidimensional and transformative framework that integrates independent learning, collaborative knowledge creation, digital mediation, reflective practice and competency-based development. The structural components created in Fig. 1 provide a conceptual basis for designing innovative educational models aimed at preparing future nurses for complex clinical realities, lifelong professional learning and active participation in knowledge-driven healthcare systems.

Prospects for Further Research should focus on the integration of artificial intelligence and digital platforms to further optimize structural knowledge mapping in health caregivers training.

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ФОРМУВАННЯ ІНФОМЕДІЙНОЇ ГРАМОТНОСТІ МАЙБУТНІХ УЧИТЕЛІВ СУСПІЛЬСТВОЗНАВЧИХ ДИСЦИПЛІН ЗАСОБАМИ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ

У статті розкрито особливості формування інфомедійної грамотності майбутніх учителів суспільствознавчих дисциплін засобами інформаційно-комунікаційних технологій. Обґрунтовано актуальність проблеми в умовах цифровізації освіти, зростання інформаційних загроз та потреби у розвитку критичного мислення, навичок аналізу медіаконтенту, перевірки інформації й безпечної роботи в цифровому середовищі. Визначено сутність поняття інфомедійної грамотності та її значення у професійній підготовці майбутнього вчителя. Охарактеризовано можливості ІКТ у розвитку вмінь пошуку, відбору, оцінювання, інтерпретації та створення інформаційного контенту. Акцентовано увагу на ролі цифрових інструментів у формуванні здатності майбутніх педагогів орієнтуватися в сучасному медіапросторі, протидіяти дезінформації та використовувати медіаресурси в освітньому процесі. Саме тому, цілеспрямоване використання ІКТ є важливою умовою формування інфомедійної грамотності майбутніх учителів суспільствознавчих дисциплін.

Обґрунтовано особливості формування інфомедійної грамотності майбутніх учителів суспільствознавчих дисциплін засобами інформаційно-комунікаційних технологій в умовах цифрового суспільства. Визначено, що інфомедійна грамотність є важливою складовою професійної підготовки майбутнього вчителя, оскільки забезпечує розвиток умінь пошуку, відбору, критичного оцінювання, інтерпретації та створення інформаційного контенту, а також здатності орієнтуватися в сучасному медіапросторі, розпізнавати маніпуляції й протидіяти дезінформації. Охарактеризовано потенціал ІКТ як ефективного засобу розвитку критичного мислення, медіакультури, цифрової компетентності та відповідального інформаційного споживання. Наголошено, що цілеспрямоване використання інформаційно-комунікаційних технологій у професійній підготовці майбутніх педагогів сприяє підвищенню якості освітнього процесу та формуванню готовності до ефективної професійної діяльності. Зазначено, що подальші дослідження доцільно спрямувати на визначення педагогічних умов, моделей і цифрових інструментів, які забезпечують ефективність формування інфомедійної грамотності у закладах вищої освіти.

Ключові слова: інфомедійна грамотність, інформаційно-комунікаційні технології, майбутні вчителі, суспільствознавчі дисципліни, професійна підготовка, цифрове середовище, медіаосвіта, критичне мислення, цифрова компетентність.

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FORMATION OF MEDIA LITERACY OF FUTURE TEACHERS OF SOCIAL SCIENCES USING INFORMATION AND COMMUNICATION TECHNOLOGIES

The article reveals the peculiarities of forming infomedia literacy of future teachers of social studies disciplines by means of information and communication technologies. The relevance of the issue is substantiated in the context of the digitalization of education, the growing number of information threats, and the need to develop critical thinking, media content analysis skills, information verification, and safe work in the digital environment. The essence of the concept of infomedia literacy and its significance in the professional training of future teachers are defined. The possibilities of ICT in developing skills of searching, selecting, evaluating, interpreting, and creating informational content are characterized. Particular attention is paid to the role of digital tools in developing future teachers' ability to navigate the modern media space, counter disinformation, and use media resources in the educational process. Therefore, the purposeful use of ICT is an important condition for the formation of infomedia literacy of future teachers of social studies disciplines.

The peculiarities of forming infomedia literacy of future teachers of social studies disciplines by means of information and communication technologies in the conditions of a digital society are substantiated. It is determined that infomedia literacy is an important component of the professional training of future teachers, as it ensures the development of skills in searching, selecting, critically evaluating, interpreting, and creating informational content, as well as the ability to navigate the modern media space, recognize manipulation, and counter disinformation. The potential of ICT as an effective means of developing critical thinking, media culture, digital competence, and responsible information consumption is