UDC 37.041-057.87
DOI: https://doi.org/10.32342/3041-2196-2025-1-29-13

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FORMATION OF KEY COMPETENCIES OF EDUCATION SEEKERS IN CONDITIONS OF BLENDED LEARNING

У представленій роботі здійснене обґрунтування особливостей формування ключових компетентностей здобувачів освіти в умовах змішаного навчання. Метою публікації є дослідження методичних підходів до формування у старшокласників ключової компетентності уміння вчитися і розробки педагогічного супроводу здобувачів вищої освіти у набутті самоосвітньої компетентності в умовах змішаного навчання.

Установлено, що такі ключові компетентності, як уміння учнів вчитися і самоосвітня компетентність студентів є необхідними у досягненні успіхів у навчанні здобувачів освіти особливо в умовах змішаного навчання. Автори розглядають можливість формування ключової компетентності уміння вчитися у старшокласників, обумовлену психологічною готовністю до самоосвіти і саморозвитку в цьому віковому періоді. У дослідженні розроблено і впроваджено у освітній процес факультатив «Основи пізнання в навчанні», запропоновано платформу для організації змішаного навчання старшокласників та методичні рекомендації вчителям щодо педагогічного супроводження учнів в умовах змішаного навчання з метою формування їх компетентностей, зокрема вміння вчитися.

Висвітлено переваги змішаного навчання в організації самостійної роботи студентів ЗВО і розвитку їх самоосвітньої компетентності. З'ясовано особливості організації самостійної роботи студентів саме за допомогою онлайн навчання з використанням систем управління навчанням, зокрема LMS Moodle.

Аналіз відповідей опитуваних допоміг розставити методичні акценти в організації навчальної діяльності на онлайн курсі. Основними етапами діяльності на курсі, які забезпечують супровід здобувачів освіти, авторами дослідження пропонується визначити: ознайомлення з курсом, його метою і завданнями; потижневе планування навчання; ознайомлення з теоретичними відомостями; виконання практичних завдань; проходження тестів; спілкування з викладачами і слухачами курсу. Установлено, що дотримання умов використання онлайн курсів у змішаному навчанні сприятиме ефективному формуванню самоосвітньої компетентності студентів.

Ключові слова: *компетентнісний підхід, загальні (ключові компетентності), змішане навчання, онлайн курси, моделювання процесу навчання, здобувачі освіти різного рівня, уміння вчитися, самоосвітня компетентність.*

Problem statement. A rapidly changing world, constant information updates, and the emergence of modern technologies encourage young people to acquire the competence of lifelong learning and to consciously approach their personal development in response to modern challenges. This applies to students at all educational levels, from general secondary to professional higher education.

According to methodological recommendations for developing components of the state standard of basic and complete general secondary education based on a competency-based approach, the secondary education system is tasked with forming, developing, and improving a set of student competencies during the learning process.

An analysis of regulatory documents [Державний стандарт базової і повної загальної середньої освіти, 2011; Навчальні програми для 10-11 класів, б.д.], which regulate the educational process in general secondary education institutions, reveals that key competence is understood as a specially structured set of personality traits that enable a person to act effectively in various life spheres and belong to the general content of the educational standard. According to the Recommendation of the European Parliament and the Council (EU) "On Key Competences for Lifelong Learning" [Рекомендації Європейського Парламенту та Ради (ЄС), 2006] and the provisions of the "Concept of the New Ukrainian School," [Нова українська школа, 2016] the implementation of educational standards and programs should ensure the development of 10 key competencies [Нова українська школа: ключові компетентності, 2020] in school graduates, including the ability to learn. A number of regulatory documents governing higher education in Ukraine [Закон України «Про вищу освіту», 2014] define general competencies as universal skills that are not subject-specific but are essential for successful future professional and social activities of a higher education student in various fields, as well as for their personal development.

Among the most relevant general competencies for every specialty and level of higher education, those proposed by the EU TUNING project include: the ability for abstract thinking, analysis, and synthesis; the ability to apply knowledge in practical situations; time management and planning skills; the ability to learn and acquire modern knowledge [Tuning Educational Structures in Europe, n.d.].

The formation of the competence to learn and acquire modern knowledge becomes especially relevant for students of various levels during the COVID-19 pandemic and martial law in Ukraine, where consistent offline learning is often not possible.

Analysis of the latest research and publications. The issue of identifying methods and approaches to forming and developing a competent individual, including the specifics of such development in various educational fields through different learning formats and assessment, has long interested researchers. We analysed this problem in the scientific literature in the following directions:

A. the specifics of forming and developing a competent personality at various educational levels;

B. scientific approaches to understanding the essence of blended learning;

C. the characteristics of blended learning from a competency-based approach in education.

A. One of the key concepts in modern learning is the Self-Determination Theory (SDT), developed by R.M. Ryan and E.L. Deci. It emphasizes the importance of the active role of the student, who has a significant potential for independent action. According to this theory [Ryan, Deci, 2007], an individual is a system capable of self-regulation, self-development, and integration of their functions to achieve personal well-being [Ryan, Deci, 2007, pp. 1–19]. It is also essential to satisfy three basic psychological needs for long-term learning motivation: autonomy, competence, and relatedness [Ryan, Deci, 2000, pp. 68–78]. Considering these aspects helps create favourable conditions for independent learning activities.

Another important model is the "70:20:10" concept [Lombardo, Eichinger, 1996], developed in the 1980s by Morgan McCall and the Center for Creative Leadership. According to it, 70% of knowledge and skills is gained through self-directed, practical experience outside the classroom; 20% – through social interaction; and only 10% – through traditional classroom learning.

This model is considered most valuable as general guidance for organizations aiming to maximize learning and development effectiveness through various types of activities. It continues to be commonly used worldwide [Lombardo, Eichinger, 1996].

These insights help focus attention on what is essential in building modern education systems.

B. An analysis of ideas and practical experience in the works of domestic experts in online education and blended learning [Триус, Герасименко, 2012, pp. 299–308; Kukharenko et al., 2016; Semerikov, Striuk, 2012, pp. 135–163] shows a wide variety of terms (blended learning, combined learning, hybrid learning), which all generally refer to the same educational technology. In Ukraine's educational space, blended learning is understood as a pedagogically sound combination of traditional classroom learning and online learning in its various forms (mobile, distance, and e-learning). The classical understanding of blended learning as an educational technology based on the "flipped classroom" model, with regular alternation between online and offline learning, is now more often interpreted as a combination of synchronous and asynchronous online learning. Different modalities of online learning – such as hybrid, HyFlex (flexible hybrid), and Multi-Access Learning – are discussed in the research of V. Irvine [Irvine, 2020]. Many scholarly sources also address issues of distance education (e. g. MOOCs) as a result of the widespread use of online courses in universities worldwide. Given the growing demand for high-quality online education, E. Knowles & K.A. Kalata discuss the design of online systems and outline a process for developing courses that ensure both content quality and course design consistency [Knowles, Kalata, 2007]. P.A. Scott [Scott, 2003, pp. 29–38] explores the teacher's role in high-quality intensive online courses. Studies by P.C. Holzweiss, B. Polnick, and F.C. Lunenburg, A. Austin and L. Gustafson, K. Vlasenko, O. Chumak, I. Sitak, O. Chashechnikova and I. Lovianova summarize students' and teachers' experiences with online learning [Austin, Gustafson, 2006, pp. 26–37; Holzweiss, Polnick, Lunenburg, 2019, pp. 299–315; Vlasenko, Chumak, Sitak, Chashechnikova, Lovianova, 2019].

C. The term "competency-based approach" refers to directing the educational process toward the development of key (basic, core) and subject-specific competencies. The result of this process is the formation of general human competence – an integrated personal characteristic combining key competencies. This characteristic should develop throughout the learning process and include knowledge, skills, attitudes, practical experience, and behavioural patterns.

From the perspective of the effectiveness of blended learning in developing student competencies, the opinions of [Korenova, 2014; Lin, Tseng, Chiang, 2017, pp. 741–770] are insightful. They describe how students received online tutoring support alongside in-person classes. Their research highlights that students were more motivated in a blended learning environment.

Student satisfaction with blended learning is also evident in studies by [Akkoyunlu, Yilmaz, 2004; Poon, 2013, pp. 271–288; So, Brush, 2008, pp. 318–336]. The transformative potential of blended learning in higher education is demonstrated in the work of [Garrison, Kanuka, 2004, pp. 95–105]. Research by [Holzweiss, Polnick, Lunenburg, 2019] also confirms students' preference for online learning within a blended environment. Thus, the studies mentioned above associate the introduction of blended learning in higher education institutions with the development of online courses.

Previously unresolved parts of the general problem. The issues that arise in the process of forming a competent learner personality are conditioned by several factors, namely: the key competence of *learning to learn* is, on the one hand, an essential component of academic success, and on the other hand, it requires special approaches to learners to help them acquire this competence.

Blended learning serves as a potential solution to educational challenges caused by modern-day demands, yet it also necessitates adequate teacher preparation for effective implementation and support of learners.

Thus, students' ability to learn and their self-education competence both ensure the effectiveness of blended learning and, simultaneously, require focused development and enhancement. These contradictions outline the direction of this study.

The purpose of the article is to explore methodological approaches to developing the key competence of learning to learn in high school students, and to design pedagogical support for higher education learners in acquiring self-education competence within the framework of blended learning.

Research methods applied are as follows: content analysis of normative and legal acts in the field of education; analysis, generalization, and specification of scientific-pedagogical and

methodological sources regarding the formation of a competent learner personality at various educational levels in the context of blended learning; surveys of educators and learners to assess their attitudes toward incorporating blended learning technologies aimed at developing learning skills and students' self-education competence. The surveys were conducted anonymously using Google Forms. All participants were informed about the study's objectives and gave their consent for the publication of the results.

Presentation of the main research material. Considering the need to develop the key competence of *learning to learn* in high school students, we base our approach on the research of [Лов'янова, Васецький, 2024, pp. 147–159], and define the psychological and pedagogical characteristics of high school learners' educational activities. For high school students, the *meaningfulness* of the learning process itself – its tasks, goals, content, and methods – is crucial. A shift in this perceived significance influences a student's attitude not only towards learning but also toward themselves. High school students show deepening interest in their own thoughts, emotions, and personal development. Their psychological profile often includes: analytical thinking, a tendency to reflect, emotional sensitivity, interest in their future, and the ability to evaluate their aptitude for their chosen profession. These traits foster qualities like observance, selectivity, and critical thinking. The motives for learning evolve as well, taking on a more vital, life-oriented meaning. Abstract and generalized thinking becomes more prominent – students start to grasp how specific examples represent broader concepts. Attitudes toward evaluation and self-evaluation also change, with self-assessment becoming more important than external opinions in shaping one's personal qualities.

Self-awareness in high school students thus reaches a higher stage – expressed through self-observation, self-assessment, the desire for self-improvement and independence – ultimately leading to self-education and self-discipline [Tokareva, Shamne, 2017].

It is at this stage that the educational content must take on a competence-based orientation. To this end, we propose an optional course called *"Foundations of Learning Cognition"* [Лов'янова, 2006]. Its goal is to help high school students gradually master creative learning experiences and improve their learning-to-learn skills through the following stages:

1. Gaining knowledge about the content and structure of cognitive operations (*metacognition*).

2. Developing the ability to logically handle educational materials and apply acquired metacognitive skills to solve problems across disciplines.

3. Cultivating creative skills through integrative knowledge generalization.

According to these stages, the content of the optional course is outlined in the course program (Table 1). Since optional learning is aligned with the aims and objectives of school education, its purpose is to ensure, alongside compulsory education, the holistic development of students' personalities, creating favourable conditions for self-determination and preparation for self-realization in society.

Table 1

Program of the Elective Course ''Fundamentals of Cognition in Learning'' [Лов'янова, 2006]

Lesson No.	Lesson content	Hours	Forms of training
Section I. Metaknowledge. Its role and place in educational activities			
1	Introductory lesson. Diagnostic section.	2	Lecture
2	Thought operations, and their role in the process of cognition.	2	Seminar
3	Analysis and synthesis as the main thought operations.	2	Practical lesson with game elements
4	Comparison. The importance of comparison in the development of thinking.	2	
5	Generalization. Methods of empirical and meaningful generalizations.	2	
6	Classification. Its types. Classification rules.	2	
Section II. Methods of thinking activity, their application to the acquired knowledge			
7	Empirical and theoretical methods of thinking activity.	2	Lecture
8	Techniques of meaningful memorization.	2	Lesson-didactic game

End of table 1

Lesson No.	Lesson content	Hours	Forms of training
9	The use of methods of thinking activity in education.	4	Group lesson
Section III. The creative nature of the acquired knowledge			
10	Implementation of mental operations of analysis and synthesis during the performance of interdisciplinary tasks.	4	Seminar
11	Comparison of research subjects using the mental operation of comparison in the course of solving problems of interdisciplinary content.	4	Workshop
12	The role of generalization in the performance of interdisciplinary tasks.	4	Workshop

During the organization of learning based on an integrated approach, students were given the opportunity to understand the interdisciplinary nature of skills related to logical operation with educational material. The content of the tasks offered to the students contributed to the development of such skills as:

– transferring learned methods of' activity to new conditions (for example, a known mathematical or physical problem is transferred to another field of knowledge or activity, raising the issue of its application);

– seeing a new problem in a familiar situation (the influence of external factors on a familiar natural or social process causes a problem that needs solving);

– combining known methods of activity in a new way (applying knowledge acquired from different disciplines to research a complex task or issue), which contributes to the development of the key competence – learning to learn.

In the context of blended learning, materials for elective classes are published on an educational platform suitable for the educational institution. As a rule, general secondary education institutions (GSEIs) use Google Classroom (a Google service designed for creating virtual classrooms).

Since not only the content of learning but also the competent guidance of the student throughout the process should promote the formation and development of their competences, let us consider the characteristics of an assessment environment that enables meaningful support for student learning and assessment, summarized from a survey of teachers:

– individualized approach through the adaptation of assessment to the abilities and needs of each student;

– variety in assessment forms (written assignments, team projects, oral presentations, and practical tasks help assess various student skills);

– open communication by providing students with feedback on their performance and specific advice for improvement;

– development of critical thinking skills (encouraging analysis, synthesis of information, and expression of personal opinions);

– assessment of progress, not just results;

– equal opportunities by ensuring all students have the same chance to succeed;

– enabling effective knowledge acquisition in accordance with each student’s learning style;

– creating a culture of collaboration through group work and mutual support;

– setting clear assessment criteria and discussing them with students;

– ensuring the value of the learning process itself, not just the final outcomes.

Higher professional education in Ukraine currently faces the challenging task of enhancing the practical focus of specialist training while maintaining its fundamental nature. This task can be achieved only if young professionals are trained based on a competency approach.

According to the International Bureau of Education, learning is a process that combines personal and social experiences and influences, aimed at acquiring, enriching, or changing knowledge, skills, values, attitudes, behaviour, and worldview. In organizing the learning process, instructors apply various models and theories of learning, which include a set of principles explaining how students best absorb, process, and integrate information. Understanding this process forms the basis for creating effective learning experiences.

A significant portion of the academic content in higher education institutions (HEIs) is dedicated to independent work. This, in turn, requires students to possess certain personal qualities manifested in their ability to learn independently – that is, to demonstrate self-educational competence. Therefore, one of the tasks of higher education is the development of students' self-learning competence.

A survey of Ukrainian HEI instructors (75 respondents) revealed that 78.3% of them consider it important to properly organize student learning activities.

In today's educational landscape, organizing students' independent work is largely implemented through online learning using Learning Management Systems (LMS) – integrated software for hosting educational content online to facilitate student collaboration, teacher interaction, and course management (registration, assessment, and academic performance analytics). Most higher and pre-higher education institutions use LMS Moodle – a full-featured system for distance learning and electronic course development. This system requires installation on a server and institutional-level administration. One advantage is that developed courses can be reused, even for different student groups. Additional services and resources can enrich the learning process and provide students with interactive ways to master the material. According to a survey of HEI instructors in Ukraine, Moodle is used in 80.4% of cases for organizing educational activities.

The survey results also allowed the formulation of the following concept: students' consistent success in achieving their goals contributes to their motivation to strive for more. Therefore, when developing a curriculum, attention should be paid to achievable goals selected by students themselves. Additionally, instructors believe that student opinions should influence course structure. Based on the research of [Knowles, Kalata, 2007] and [Kebritchi, Lipschuetz, Santiague, 2017], which confirm the need to create a survey to identify prospective course participants' expectations during development, a student survey was conducted to understand their expectations from online courses. Here are some results:

– 87% expressed a desire for video accompaniment of theoretical material;

– 92% wanted to use closed-type tests to monitor their learning progress;

– 92% supported the option to share their learning impressions on an open forum;

– 75% wanted contact with a tutor to monitor and adjust their course learning process;

– 59.6% agreed to work according to an individual schedule while working through the course;

– 100% unanimously wanted to use the course for independent work on subjects in their educational program.

The analysis of responses helped highlight certain methodological aspects of organizing learning activities in the course. The main stages of course activity supporting learners are proposed as follows: orientation with the course, its goals and objectives; weekly learning planning; introduction to theoretical materials; completion of practical tasks; taking tests; communication with instructors and course participants. The content of each stage is presented in Table 2.

Table 2

Organization of the course participants' activities

Stage of activity on the course	Tutors' Activities / Tool	Activities of the students
Introduction to the course, its purpose and objectives	formulating the tasks of the course, and outlining the terms of work (video)	Users start studying at the course from the moment of registration, and therefore for each student the first academic week on the course begins individually, and in accordance with the start of training, a personal time for the end of the school week is set
Weekly Study Planning	formulating the tasks of the week (video)	Users get familiarized with the plans and tasks for the school week
Introduction to theoretical information	presenting an educational topic (video, text documents)	Users get familiarized with the theoretical material, work it out at their own pace within the school week

End of table 2

Stage of activity on the course	Tutors' Activities / Tool	Activities of the students
Performing practical tasks	offering resources that allow students to get involved in different activities (video)	Users watch videos with recommendations for completing a practical task; independently choose a section of mathematics to create their own product according to the task of the week; perform tasks; present the work at the weekly forum.
Passing tests	offering students self-examination of knowledge (test tasks)	Users check the level of mastery of the topic by taking the test, which is considered to be passed if there are 60% of correct answers, and the number of times of doing the test is unlimited
Mutual verification of course participants	offering to use pre-developed criteria for evaluating tasks (text document with criteria for evaluating tasks)	Users check the works of two fellow students; evaluate them; and discuss the works on the forum
Use of modern learning technologies	offering the involvement of modern learning technologies in the preparation of practical tasks of the week	Users get familiarized with examples of the use of modern technologies
Communication with teachers and students of the course	involving course participants in the weekly forums	Users participate in the weekly forums

This approach to using online courses in blended learning will foster the development of students' self-learning competence, provided the following conditions are met:

– clear presentation of the goal;

– alignment of the goal with students' expectations;

– a direct alignment between learning objectives, student activities in the course, and their assessment;

– selection of educational materials and technologies that correspond to learning objectives, motivate students, and support their outcomes;

– providing forums not only for informational communication among learners but also for encouraging active participation in forum discussions, which tends to correlate with a higher level of mastery of the course material;

– content as the main tool for assessing the quality of online courses being accompanied by student evaluation.

Conclusions. The conducted research substantiates the importance of developing key competencies in learners, such as the ability to learn and self-educational competence of university students. To ensure the effective formation of this competence, an elective course for high school students titled *"Fundamentals of Cognition in Learning"* was developed, along with a proposal to integrate it into the information and educational environment of secondary education institutions using Google cloud services. The analysis of resources and scientific studies confirmed the necessity of pedagogical support for students, which enables the creation of meaningful, supportive learning and assessment, and contributes to the development of students' competencies.

A comprehensive analysis of the development of blended learning for higher education students demonstrates its significant potential in forming students' self-educational competence. Participation in online courses increases motivation to learn, fosters self-control and reflection, and develops teamwork skills. The analysis of survey responses helped highlight methodological priorities for organizing student activities in online courses. In particular, it was established that course development and content creation should be accompanied by ongoing surveys of future users, and adherence to the conditions for using online courses in blended learning will promote effective formation of students' self-educational competence.

Adherence to Ethical Standards.

During our empirical research, authors adhered to applicable ethical principles, including the principles of voluntary participation, informed consent, and confidentiality. All procedures conducted in the course of the study complied with the ethical standards of the institutional research committee, the 1964 Helsinki Declaration and its later amendments, or comparable ethical standards.

Bibliography

Державний стандарт базової і повної загальної середньої освіти. (2011). Відновлено з https://zakon.rada.gov.ua/laws/show/1392-2011-%D0%BF#Text

Закон України «Про вищу освіту». (2014). Відновлено з http://zakon4.rada.gov.ua/laws/show/1556-18

Кремень, В. Г. (Ред.). (2014). *Розроблення освітніх програм: методичні рекомендації.* Київ: ДП «НВЦ «Пріритети».

Кухаренко, В. (Ред.). (2016). *Теорія та практика змішаного навчання.* Харків: «Міськдрук».

Лов'янова І. В. (2006) *Формування інтелектуальних умінь старшокласників у процесі вивчення предметів природничого циклу*: (Дис. канд. пед. наук). Інститут педагогіки АПН України. Київ.

Лов'янова, І., Васецький, О. (2024). Формування ключових компетентностей старшокласників у навчанні природничих дисциплін. *Математика, інформатика, фізика: наука та освіта*, 1(2), 147–159. doi: 10.31652/3041-1955/2024-01-02-06

Навчальні програми для 10-11 класів. (б.д.). Відновлено з https://mon.gov.ua/osvita-2/zagalna-serednya-osvita/osvitni-programi/navchalni-programi-dlya-10-11-klasiv

Нова українська школа: ключові компетентності. (2020). Відновлено з https://uied.org.ua/2020/03/323/

Нова українська школа: Концептуальні засади реформування середньої школи. (2016). Відновлено з https://mon.gov.ua/static-objects/mon/sites/1/zagalna%20serednya/nova-ukrainska-shkola-compressed.pdf

Рекомендації Європейського Парламенту та Ради (ЄС) «Про основні компетенції для навчання протягом усього життя». (2006). Відновлено з https://zakon.rada.gov.ua/laws/show/994_975#Text

Семеріков, С., Стрюк, А. (2012). Комбіноване навчання: проблеми і перспективи застосування в удосконаленні навчально-виховного процесу й самостійної роботи студентів. О. Коновал (Ред.), *Теорія і практика організації самостійної роботи студентів вищих навчальних закладів.* (с. 135–163). Кривий Ріг: Книжкове видавництво Киреєвського.

Токарева, Н. М., Шамне, А. В. (2017) *Вікова та педагогічна психологія: навчальний посібник для студентів вищих навчальних закладів*. Київ.

Триус, Ю. В., Герасименко, І. В. (2012). Комбіноване навчання як інноваційна освітня технологія у вищій школі. *Теорія та методика електронного навчання,* 3, 299–308. doi: 10.55056/e-learn.v3i1.353

Akkoyunlu, B., Yilmaz, M. (2004). *A study on students' views about blended learning environmen*t. Retrieved from https://eric.ed.gov/?id=ED494342

Austin, A. M., Gustafson, L. (2006). Impact of course length on student learning. *Journal of Economics and Finance Education,* 5 (1), 26–37.

Garrison, D. R., Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95–105. doi: 10.1016/j.iheduc.2004.02.001

Holzweiss, P. C., Polnick, B., Lunenburg, F. C. (2019). Online in half the time: A case study with online compressed courses. *Innovative Higher Education,* 44(4), 299–315. doi: 10.1007/s10755-019-09476-8

Irvine, V. (2020). The landscape of merging modalities. *EDUCAUSE Review*. Retrieved from https://er.educause.edu/articles/2020/10/the-landscape-of-merging-modalities

Kebritchi, M., Lipschuetz, A., Santiague, L. (2017) Issues and challenges for teaching successful online courses in higher education: A literature review. *The Journal of Educational Technology Systems (ETS)*, 46 (1), 4–29. doi: 10.1177/0047239516661713

Knowles, E., Kalata, K.A. (2007). Model for enhancing online course development. *Innovate*, 4 (2), article 3. Retrieved from https://nsuworks.nova.edu/innovate/vol4/iss2/3/

Korenova, L. (2014). *Blended learning in teaching mathematics at primary and secondary school*. Retrieved from https://www.researchgate.net/publication/317851421

Lin, Y.-W., Tseng, C.-L., & Chiang, P.-J. (2017). The effect of blended learning in mathematics course. *EURASIA Journal of Mathematics, Science and Technology Education,* 13(3), 741–770. doi: 10.12973/eurasia.2017.00641a

Lombardo, M.M., Eichinger, R.W. (1996). *The Career Architect Development Planner*. Minneapolis, MN: Lominger Limited.

Poon, J. (2013). Blended learning: an institutional approach for enhancing students' learning experiences. *Journal of Online Learning and Teaching*, 9 (2), 271–288.

Ryan, R. M., Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., Deci, E. L. (2007). Active human nature: Self-Determination theory and the promotion and maintenance of sport, exercise, and health. In M.S. Hagger, N. L. D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 1–19). Leeds: Human Kinetics Europe Ltd.

Scott, P. A. (2003). Attributes of high-quality intensive courses. *New Directions for Adult and Continuing Education,* 97, 29–38. doi: 10.1002/ace.86

So, H.-J., Brush, T. A. (2008). Student perceptions of collaborative learning, social presence, and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education*, 51(1), 318–336. doi: 10.1016/j.compedu.2007.05.009

Tuning Educational Structures in Europe. (n.d.). Retrieved from http://www.unideusto.org/tuningeu/

Vlasenko, K., Chumak, O., Sitak, I., Chashechnikova, O., Lovianova, I. (2019). Developing informatics competencies of computer sciences students while teaching differential equations. *Revista Espacios*, 40 (31). Retrieved from https://www.revistaespacios.com/a19v40n31/19403111.html

References

Akkoyunlu, B., Yilmaz, M. (2004). A Study on Students' Views about Blended Learning Environment. Available at: https://eric.ed.gov/?id=ED494342 (Accessed 20 March 2025).

Austin, A. M., Gustafson, L. Impact of course length on student learning. *Journal of Economics and Finance Education*, 2006, no 5 (1), pp. 26-37.

Holzweiss, P. C., Polnick, B., Lunenburg, F. C. (2019). Online in half the time: A case study with online compressed courses. *Innovative Higher Education,* 2019, vol. 44, issue 4, pp. 299–315. doi: 10.1007/s10755-019-09476-8

Irvine, V. (2020). The Landscape of Merging Modalities. *EDUCAUSE Review*. Available at: https://er.educause.edu/articles/2020/10/the-landscape-of-merging-modalities (Accessed 12 March 2025).

Kebritchi, M., Lipschuetz, A., Santiague, L. Issues and challenges for teaching successful online courses in higher education: A literature review. *The Journal of Educational Technology Systems (ETS)*, 2017, vol. 46, issue 1, pp. 4–29. doi: 10.1177/0047239516661713

Knowles, E., Kalata, K. A. (2007). Model for enhancing online course development. *Innovate*, vol. 4, issue 2, AN: 3. Available at: https://nsuworks.nova.edu/innovate/vol4/iss2/3/ (Accessed 12 March 2025).

Korenova, L. (2014). *Blended learning in teaching mathematics at primary and secondary school*. Available at: https://www.researchgate.net/publication/317851421 (Accessed 12 March 2025).

Kremen, V. G. (Ed.). (2014). *Rozroblennia osvitnikh prohram: metodychni rekomendatsii* [Development of educational programs: methodological recommendations]. Kyiv, Priorities Publ., 120 p. (In Ukrainian).

Kuharenko, V. (Ed.). (2016). *Teoriia ta praktyka zmishanoho navchannia* [Theory and practice of blended learning]. Kharkiv, Miskdruk Publ., 284 p. (In Ukrainian).

Lin, Y.-W., Tseng, C.-L., & Chiang, P.-J. The effect of blended learning in mathematics course. *EURASIA Journal of Mathematics, Science and Technology Education,* 2017, vol. 13, issue 3, pp. 741–770. doi: 10.12973/eurasia.2017.00641a

Lombardo, M. M., Eichinger, R. W. (1996). *The Career Architect Development Planner*. Minneapolis, MN, Lominger Limited, 767 p.

Lovianova I. V. (2006) *Formuvannia intelektualnykh umin starshoklasnykiv u protsesi vyvchennia predmetiv pryrodnychoho tsyklu.* Dys. kand. ped. nauk. [Shaping the intellectual skills of senior pupils in process of studying natural sciences. Cand. ped. sci. diss.] Kyiv, 208 p. (In Ukrainian).

Lovianova, I., Vasetskyi, O. (2024) Formation of key competencies of high school students in learning natural sciences. *Mathematics, Informatics, Physics: Science and Education,* 2024, vol. 1, no. 2, pp. 147–159. doi: 10.31652/3041-1955/2024-01-02-06 (In Ukrainian).

Ministry of Education and Science of Ukraine (2017), "Curriculum for grades 10-11", available at: https://mon.gov.ua/osvita-2/zagalna-serednya-osvita/osvitni-programi/navchalni-programi-dlya-10-11-klasiv (Accessed 15 March 2025). (In Ukrainian).

New Ukrainian School: Key Competencies. (2020). Available at: https://uied.org.ua/2020/03/323/ (Accessed 27 March 2025). (In Ukrainian).

Nova ukrainska shkola: Kontseptualni zasady reformuvannia serednoi shkoly [New Ukrainian School: Conceptual principles of secondary school reform]. (2006). Available at: https://mon.gov.ua/static-objects/mon/sites/1/zagalna%20serednya/nova-ukrainska-shkola-compressed.pdf (Accessed 3 April 2025). (In Ukrainian).

Poon, J. Blended learning: an institutional approach for enhancing students' learning experiences. *Journal of online learning and teaching*, 2013, no. 9 (2), pp. 271-288.

Recommendations of the European Parliament and of the Council (EU) "On key competences for lifelong learning". (2022). Available at: https://zakon.rada.gov.ua/laws/show/994_975#Text (Accessed 02 March 2025). (In Ukrainian).

Ryan, R. M., Deci, E. L. (2007). Active human nature: Self-Determination theory and the promotion and maintenance of sport, exercise, and health. *Intrinsic motivation and self-determination in exercise and sport*. Leeds, Human Kinetics Europe Ltd., pp. 1–19.

Ryan, R. M., Deci, E. L. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 2000, no. 55, 68–78. doi: 10.1037/0003-066X.55.1.68

Scott, P. A. Attributes of high-quality intensive courses. *New Directions for Adult and Continuing Education,* 2003, issue 97, pp. 29–38. doi: 10.1002/ace.86

Semerikov, S., Striuk, A. (2012). *Kombinovane navchannia: problemy i perspektyvy zastosuvannia v udoskonalenni navchalno-vykhovnoho protsesu y samostiinoi roboty studentiv* [Combined learning: problems and prospects of application in improving the educational process and self-learning work of students]. *Teoriia i praktyka orhanizatsii samostiinoi roboty studentiv vyshchykh navchalnykh zakladiv* [Theory and practice of organizing independent educational work of students of higher educational institutions]. Kryvyi Rih, Kireevskyi Book Publ., pp. 135–163. (In Ukrainian).

So, H.-J., Brush, T. A. Student perceptions of collaborative learning, social presence, and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education*, 2008, vol. 51, issue 1, pp. 318–336. doi: 10.1016/j.compedu.2007.05.009

Tokareva, N. M., Shamne, A. V. (2017). *Vikova ta pedahohichna psykholohiia* [Age and pedagogical psychology]. Kyiv, 549 p. (In Ukrainian).

Tryus, Yu., Herasymenko, I. The combined study as innovative educational technology in higher education. *Theory and Methods of E-Learning*, 2014, no. 3 (1), pp. 299–308. doi: https://doi.org/10.55056/e-learn.v3i1.353 (In Ukrainian).

Tuning Educational Structures in Europe. (n.d.). Available at: http://www.unideusto.org/tuningeu/ (Accessed 10 March 2025).

Verkhovna Rada of Ukraine (2011), "State standard of basic and comprehensive secondary education", available at: https://zakon.rada.gov.ua/laws/show/1392-2011-%D0%BF#Text (Accessed 05 March 2025). (In Ukrainian).

Verkhovna Rada of Ukraine (2014), Law of Ukraine "On Higher Education", available at: http://zakon4.rada.gov.ua/laws/show/1556-18 (Accessed 12 March 2025). (In Ukrainian).

Vlasenko, K., Chumak, O., Sitak, I., Chashechnikova, O., Lovianova, I. Developing informatics competencies of computer sciences students while teaching differential equations. *Revista Espacios*, 2019, vol. 40, no. 31. Available at: https://www.revistaespacios.com/a19v40n31/19403111.html (Accessed 10 March 2025).

FORMATION OF KEY COMPETENCIES OF EDUCATION SEEKERS IN CONDITIONS OF BLENDED LEARNING

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DOI: https://doi.org/10.32342/3041-2196-2025-1-29-13

Keywords: *competency-based approach, general (key) competencies, blended learning, online courses, modelling the learning process, education seekers of different levels, learning to learn, self-educational competence.*

The presented work substantiates the peculiarities of the formation of key competencies of education seekers in conditions of blended learning. We analysed this problem in the scientific literature in the following directions: A. the specifics of forming and developing a competent personality at various educational levels; B. scientific approaches to understanding the essence of blended learning; C. the characteristics of blended learning from a competency-based approach in education.

The purpose of the article *is to study methodological approaches to the formation of the key learning-to-learn competence in high school students and to develop pedagogical support for higher education students in acquiring self-educational competence under blended learning conditions.*

The following research methods were used: content analysis of regulatory legal acts in the field of education; analysis, generalization, and specification of scientific-pedagogical and methodological sources regarding the formation of a competent personality of education seekers at various levels in blended learning environments; surveys of teachers and education seekers on their attitude towards the use of blended learning technologies to develop students' ability to learn and the self-educational competence of university students.

It was found that such key competencies as the ability of school students to learn and the self-educational competence of students are essential for achieving educational success, especially in blended learning conditions. The authors researched the possibility of developing the key learning-to-learn competence in high school students, conditioned by their psychological readiness for self-education and self-development at this age. The study developed and implemented an elective course titled "Fundamentals of Cognition in Learning" within the educational process; a platform for organizing blended learning for high school students was proposed, along with methodological recommendations for teachers on how to provide pedagogical support to students in blended learning environments to foster their competencies.

The advantages of blended learning in organizing the independent work of university students and developing their self-educational competence are highlighted – particularly through online learning using learning management systems, such as LMS Moodle.

The analysis of respondents' answers helped to set methodological focuses in organizing learning activities in an online course. The authors of the study propose identifying the following key stages of the course, which ensure support for learners: familiarization with the course, its purpose and objectives; weekly learning planning; introduction to theoretical materials; completion of practical tasks; taking

tests; and communication with instructors and fellow participants. It was found that compliance with the conditions for using online courses in blended learning contributes to the effective formation of students' self-educational competence.

Conclusions. *The conducted research substantiates the importance of developing key competencies in learners, such as the ability to learn and self-educational competence of university students. To ensure the effective formation of this competence, an elective course for high school students titled "Fundamentals of Cognition in Learning" was developed, along with a proposal to integrate it into the information and educational environment of secondary education institutions using Google cloud services.*

A comprehensive analysis of the development of blended learning for higher education students demonstrates its significant potential in forming students' self-educational competence. Participation in online courses increases motivation to learn, fosters self-control and reflection, and develops teamwork skills.