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Evaluating the Necessity of Educational Competence for Lecturers through Digitization of Study Subject Content

Vida Navickienė Dr.; **Kristina Viršulienė** Dr.
Vilnius Gediminas Technical University, Lithuania
vida.navickiene@vilniustech.lt; kristina.virsuliene@vilniustech.lt

Abstract: The article analyses the relationship between educational and digital competences in the development of digital study tools and digitisation of the content of study subjects. A quantitative study was conducted, that is, a survey of lecturers who have participated in educational and content digitisation training courses and developed digital study tools. Simple quantitative analysis was used to process the data. The results of the survey showed that the development and use of digital tools require not only learning the different tools for digitisation, but also knowing what didactic purposes they can be used for and what learning goals they can be used to achieve. Thus, digitising the content of the subject begins with the selection of appropriate tools that serve specific didactic goals. The findings underscore the imperative to improve educational competence through the digitisation of study subject content.

Keywords: educational competences, digital competence, digitisation, higher education.

Introduction

Higher education is constantly undergoing various transformations that are strongly influenced by external and internal factors. External factors are linked to globalisation, which is mainly achieved through the pursuit of internationalisation elements in higher education institutions and their integration into the study process. Internationalisation also encourages competition. Various elements of internationalisation are becoming part of the ranking and image of higher education institutions. Internal demand is manifested through student retention, through the availability of changing and diversifying forms of study. Contact, blended, distance, and hybrid studies are offered to the public, as well as microcredentials or part-time studies, courses, etc. Thus, in the context of competition between higher education institutions and the emergence or intensification of new forms of study, the digital content of study subjects is becoming extremely relevant. Such changes and challenges in higher education also reaffirm the need and relevance of lifelong learning for those involved in higher education, especially lecturers. The quality in question includes various aspects, including the quality of infrastructure, lecturers, education specialists, students, and other supporting elements. Lecturers, as determinants of the quality of a higher education service system, are required to effectively manage their professional duties. They serve as professional educators and scholars with a primary responsibility to transform, develop, and disseminate knowledge in science, technology, and the arts through teaching, research, and community service programs (Retnowati et al., 2021).

Recommendations of the European Council on key competences (2006) state that competences are regarded as "<...> as a combination of knowledge, skills, and attitudes appropriate to the context. Key competences are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment. The Reference Framework sets out eight key competences: 1. Communication in the mother tongue; 2. Communication in foreign languages; 3. Mathematical competence and basic competences in science and technology; 4. Digital competence; 5. Learning to learn; 6. Social and civic competences; 7. Sense of initiative and entrepreneurship; 8. Cultural awareness and expression" (Recommendation of the European Commission, 2006, 13).

Five areas of competence are distinguished:

1. Information and data literacy (browsing, searching, filtering data, information and digital content; evaluating data, information and digital content; managing data, information and digital content Competence area);
2. Communication and collaboration (interacting through digital technologies; sharing through digital technologies, engaging in citizenship through digital technologies; collaborating through digital technologies; netiquette; managing digital identity);

3. Digital content creation (developing digital content; integrating and re-elaborating digital content; copyright and licences; programming);
4. Safety (protecting devices, protecting personal data and privacy; protecting health and well-being; protecting the environment);
5. Problem solving (solving technical problems; identifying needs and technological responses; creatively using digital technologies; identifying digital competence gaps).

The approach to digital competence is changing as there is a shift from three levels of competence/proficiency (foundation, intermediate, and advanced) to eight levels, which are revealed through complexity of task, autonomy, and cognitive domain. A wider and more detailed range of proficiency levels supports the development of learning and training materials (Carretero Gomez et al., 2017, 11). Van Hong, Tuyen, and Luong (2018) emphasise that 21st-century educators must possess a minimum of three competencies, one of which is the adept application of technology in learning. Digital competence encompasses the adept and discerning use of Information Society Technology (IST) for professional endeavours, recreation, and communication. Integral to this competence are essential knowledge, skills, and attitudes, including an understanding of how IST fosters creativity and innovation, awareness of issues surrounding the validity and reliability of available information, and comprehension of the legal and ethical principles pertinent to the interactive use of IST (Recommendation of the European Commission, 2006, p. 15). All key competences are regarded equally vital, as each contributes to a prosperous life in a knowledge-based society. Many competences exhibit overlap and synergy. Several recurring themes permeate the Reference Framework, such as critical thinking, creativity, initiative, problem-solving, risk assessment, decision-making, and constructive management of emotions, which are integral to all eight key competences (Recommendation of the European ..., 2006, p. 15).

In the development of digital content (digital learning tools), the key to quality is not only teachers with high digital competences, but also, and especially, teachers with educational competences. Ericsson (2008) argues that expertise is the result of deliberate practice. Therefore, because learning at work appears to be essential for teachers to develop themselves professionally, it is vital to carefully study its predictive validity and how to stimulate it (Evers et al., 2016).

M. Wieland and L. Michael (2023) assert that personal openness to digital teaching profoundly impacts attitude, intention, and individual capabilities. 1.Empowering the lecturer: To optimise the efficacy of digital education, it is advisable to grant lecturers access to digital learning materials along with the necessary training to use them effectively. This calls for allocating adequate time for lecturers to engage with the digital learning components and grasp their functionalities. 2. Promoting intrinsic digital education: Integration of digital education should not be obligatory but rather be driven by the lecturer's intrinsic motivation. Universities should provide lecturers with comprehensive information and resources. Furthermore, there should be flexibility in workload regulations, encouraging lecturers to allocate time to acquiring digital skills. 3. Fostering intention: Despite the absence of a significant correlation between intention and usage in the study, it is suggested that universities motivate lecturers to embrace digital education by nurturing personal openness and dismantling barriers. This could involve establishing accessible channels for lecturers to share experiences and best practices, as well as providing platforms for mutual support among lecturers.

The use of technological solutions to digitise content also needs to be considered. Arthur-Nyarko, Agyei and Armah (2020) analyse learners' readiness to use digital learning materials. The reports of the respondents on their effectiveness showed that the majority (more than 70%) of them confirmed that they are ready to use digital learning materials.

The aim of the article is to examine the necessity of the development of educational competence for lecturers through digitisation of study subject content. This is achieved by analysing the viewpoints of lecturers who have undergone the digitisation process.

Methodology

The research questions are as follows: do educators who acquire digital skills adequately consider educational contexts? Is it imperative for them to possess proficiency in digital tools, or should classical

educational principles take precedence – beginning with defining learning objectives and then adapting tools accordingly? In Lithuania, as of January 2023, all higher education institutions have been included in the project "Digital Transformation of Education ("EdTech")". The aim of the project is to promote educational innovation based on digital technologies in the education sector by enabling the development and testing of innovations in educational institutions and by providing advice through technology-savvy teacher-innovators and experts who will support educational institutions and educators facing difficulties in using technologies and digital resources. The project aims to enable the education system to operate more efficiently and improve the quality of learning outcomes through educational technology and digital innovation.

VILNIUS TECH has been one of the main institutions involved in the project. Throughout the year, the objective was to train 68 lecturers and create 89 innovative digital tools within the MOODLE virtual learning environment. The project was coordinated and executed by e-learning specialists and educational researchers, with participation primarily from engineering educators. These digital tools were developed by lecturers in accordance with precise criteria established by the project organisers. In addition, the participants underwent 66 hours of training in digitisation and educational techniques. Consequently, in the process of digitising the course content and crafting digital learning tools, questions often arise regarding the need for educational competence. While subject expertise is crucial in digital tool development, the ability to effectively present it to students requires educational competence, thereby merging with digital proficiency.

Data were gathered using a combination of scientific literature and document analysis, alongside a quantitative research approach through written surveys. The survey was conducted in October 2023, with questionnaires distributed to 68 lecturers, out of which 53 were returned, yielding a response rate of 57% in the field of technology, 32% in social sciences, 6% in humanities, and 5% in natural sciences. Among the respondents, 55% held the position of associate professor, 27% were professors, and 18% were lecturers. The highest percentage of respondents, 43%, reported having 11-20 years of teaching experience, followed by 34% with 21-30 years of experience, 18% with 6-10 years of experience, and only 2% with less than 5 years of experience.

Results and Discussion

The empirical study of VILNIUS TECH reveals the results of the assessment of the competences of the lecturers who have developed the digital content of their study subjects (digital study tools) and the need for their further development. The respondents identified the most important or essential competences of higher education lecturers working with digital teaching tools (DTMs) (Figure 1) as: information technology competence (61.4%) and competence for continuous improvement (56.8%), communication competence (47.7%), and didactic competence and evaluation competence (45.5%). Thus, the competences of professional performance, information and data literacy, communication and collaboration, and digital content creation, which are highlighted in DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use (http://europa.eu/!Yg77Dh) by the European Commission's Joint Research Centre - © European Union, 2017) are important for teachers. The questionnaire was designed to select the competences constituting the educational competences, which were relevant to the content of the implemented trainings, and thus could reveal the lecturers' views on the effectiveness of the trainings and the need for future competence development.

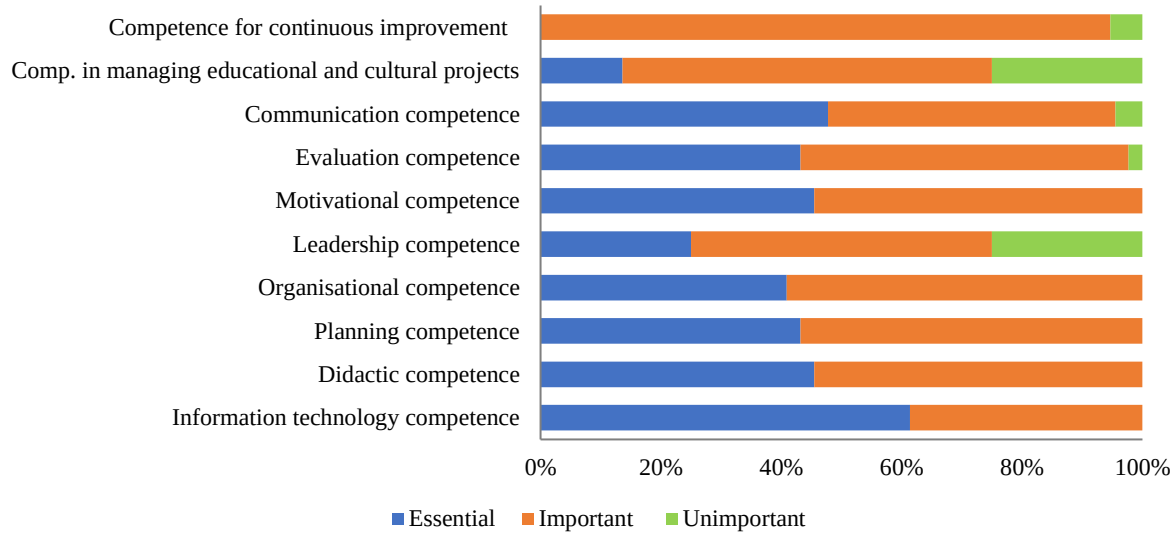

Figure 1. **Key competences of a lecturer working with digital teaching tools (DTMs)**

The most significant change in professional and personal development for the lecturers who participated in the training sessions was in the following areas: developing new teaching tools, which was rated the highest on a 5-point scale by more than half (54%) of the respondents. The highest scores were also given to the following competences related to lifelong learning: keeping learning and helping others to learn (56.8%), being open to new ideas and experiences and encouraging others to be open to them (45.5%) and using active teaching methods (40.9%). This perspective aligns with the assertion by Jones (2018) that 21st-century education emphasises the cultivation of both social and individual competences, complemented by critical thinking, creativity, adaptability, and entrepreneurial abilities. Thus, the competences for professional evaluation and development were perceived by lecturers to have improved in three dominant areas: developing new learning tools, learning new subjects and being flexible to educational innovations (Figure 2).

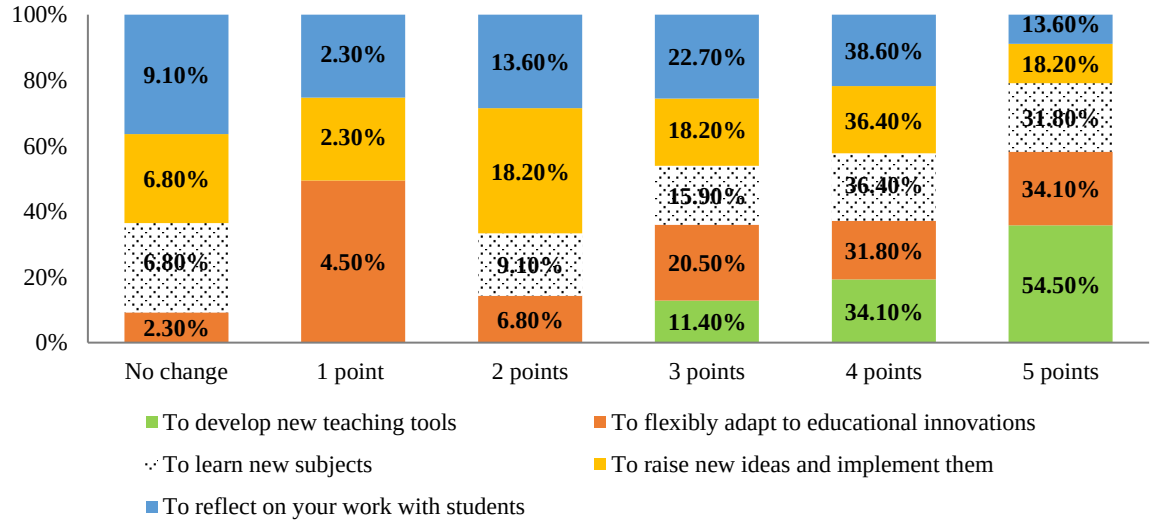

Figure 2. **Self-assessment of lecturer professional performance and development competence**

In terms of competences, the competences of designing and implementing the educational process are rated good (5 and 4 points): to create assignments for student collaboration 32%, to apply active teaching/learning methods 31%, to create assignments that encourage reflection and to design assignments that students may choose to complete additionally as independent work 30 %, to develop assignments for students to complete with IT (information technologies) 29 %, to plan the educational process to achieve the aims set 28%, to evoke student interest in the process of learning the subject 27

%. The improvement in the ability to explain theoretical material to students by 10%, to organise problem-based learning, to develop student creativity, to set specific, measurable and achievable aims for student education by 9% were considered as very weak and weak (1 and 2 points) (Table 1). Wieland and Michael (2023) state that digital learning approaches are implemented through various learning elements. Digital learning elements, therefore, represent the implementation or the tool through which knowledge is digitally delivered. <...> Digital elements are increasingly being used in higher education teaching, but the intention and its actual use vary depending on the lecturers. <...> an intention–behaviour gap has been identified: only one-time effort to become familiar with digital elements has a significant impact on actual usage. We conclude that, above all, teachers must first be given the opportunity to become familiar with digital learning elements to be able to use them effectively. <...>.

Table 1

Self-assessment in lecturer competence of educational process modelling and implementation

Skills	No change	1 point	2 points	3 points	4 points	5 points
to explain the theoretical material to students	11.4%	9.1%	13.6%	25.0%	20.5%	20.5%
to evoke student interest in the process of learning the subject	2.3%	9.1%	9.1%	18.2%	29.5%	31.8%
to create assignments for student collaboration	2.3%	2.3%	9.1%	13.6%	38.6%	34.1%
to develop assignments that encourage reflection	4.5%	4.5%	6.8%	15.9%	40.9%	27.3%
to design assignments that students may choose to complete as additional independent work	0.0%	2.3%	11.4%	18.2%	31.8%	36.4%
to develop assignments for students to complete with IT (information technologies)	4.5%	2.3%	9.1%	18.2%	38.6%	27.3%
to apply active teaching/learning methods	0.0%	2.3%	2.3%	25.0%	29.5%	40.9%
to develop student creativity	2.3%	4.5%	15.9%	25.0%	22.7%	29.5%
to organise problem-based teaching	4.5%	13.6%	6.8%	22.7%	29.5%	22.7%
to set specific, measurable and achievable aims for student education	4.5%	11.4%	9.1%	25.0%	25.0%	25.0%
to plan the educational process to achieve the aims set	4.5%	4.5%	13.6%	13.6%	36.4%	27.3%

The ability of a lecturer to plan evaluation and assess student progress and achievement is crucial. The following abilities were rated as excellent by the survey respondents after 66 hours of training aimed at improving educational and digital competences: to critically analyse and interpret the results and progress of students' learning activities and data to collect information for the improvement of teaching and learning to be open to new ideas and experiences and to encourage openness in others 24 %, to enhance students' motivation to learn and to clarify whether the student outcomes achieved reflect the intended aims 23 %, to evaluate the performance of an individual in the group 21 %, to evaluate the performance results of the group (collaboration) 20 % (Table 2).

Table 2

Self-assessment of lecturer competences for evaluating students' progress and achievements

Skills	No change	1 point	2 points	3 points	4 points	5 points
to clarify whether the student outcomes achieved reflect the intended aims	2.3%	11.4%	15.9%	18.2%	34.1%	18.2%
to evaluate the performance results of the group (collaboration)	4.5%	18.2%	13.6%	18.2%	31.8%	13.6%
to evaluate the performance of an individual in the group	6.8%	15.9%	9.1%	20.5%	27.3%	20.5%
to use different forms of assessment (cumulative, formative, etc.)	9.1%	13.6%	11.4%	22.7%	25.0%	18.2%
to choose the most appropriate assessment format/method	11.4%	13.6%	20.5%	15.9%	13.6%	25.0%
to identify students' motivation to learn	9.1%	15.9%	15.9%	15.9%	25.0%	18.2%
to enhance students' motivation to learn	4.5%	15.9%	9.1%	18.2%	31.8%	20.5%
to critically analyse and interpret the results and progress of students' learning activities and data to collect information for the improvement of teaching and learning to be open to new ideas and experiences and to encourage openness in others	2.3%	18.2%	4.5%	20.5%	29.5%	25.0%

Teamwork and leadership competences are perceived to be less improved. Collaborating with colleagues to design educational activities is an area that needs to be improved. Since the lecturers initially underwent joint theoretical and practical training followed by individual consultations, they had limited opportunities to collectively develop digital tools. Consequently, one fifth of the respondents indicated no change in their ability to collaboratively design educational activities with colleagues. However, a third of the lecturers rated the improvement in these skills as 5 and 4. Based on our experience as lecturers who facilitate competence development training, it is evident that participants approach training with diverse objectives, and discrepancies in personality and communication styles play a significant role. During training sessions in which trainers explored and digitised teaching tools, some participants engaged in sharing experiences, asking questions, and discussing with colleagues, while others focused more on tool preparation and individual self-learning or consultations with trainers.

Approximately 48% of lecturers evaluated their proficiency in working with gifted students as excellent or very good (4 and 5 points), while about 43% rated their capability in teaching students with specific needs similarly (Fig. 3). The study by Wei, Haiwang, Yenchun and Mark (2023) shows that students' satisfaction with digitised content depends on the specifics of the study subject. Additionally, the antecedents of student attention vary depending on the course discipline. The disconfirmation effect exhibits course-discipline dependency, being most pronounced in Technical Science courses and least significant in Humanities & Natural Science courses. This means that technological sciences need even more attention to attract and motivate student learning. Interest in the content itself serves as the primary motivation for students. Although numerous factors impact

learner attitudes toward MOOCs, the extent of their influence varies individually, with not all factors equally affecting learner satisfaction.

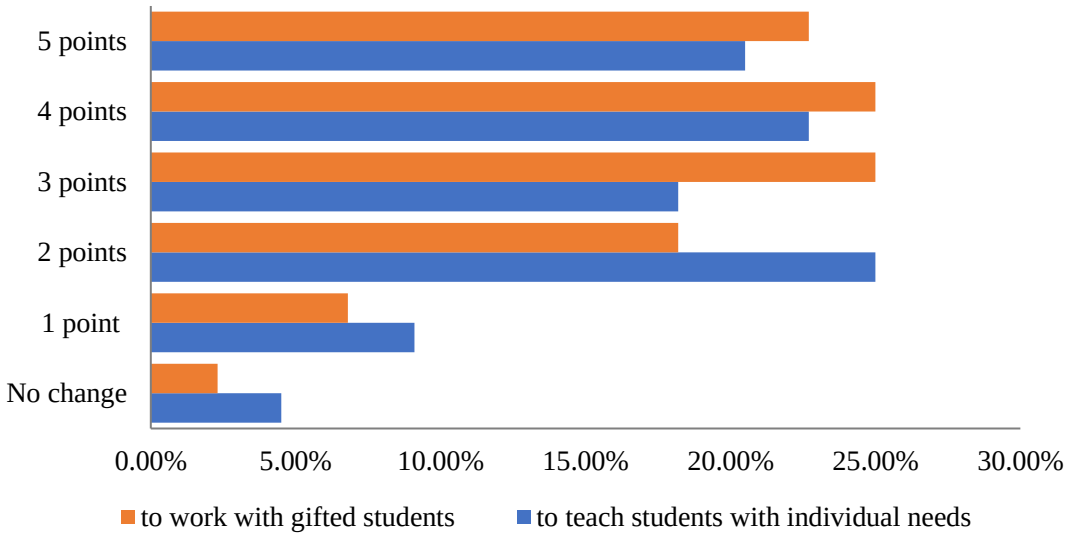

Figure 3. **Self-assessment of lecturer competences teamwork and leadership**

The survey participants were asked what other competences and skills they had improved that were not mentioned in the questionnaire. These included information retrieval and IT management skills, and increased creativity in the development of digital learning materials, gamification, and more diverse educational activities.

Developing and using digital tools requires not only learning the different tools for digitisation, but also knowing what didactic purposes they can be used for and what learning aim they can achieve. Thus, the content of the subject is the first to be digitised through the selection of the appropriate tools (digital competence), in line with the didactic objectives (educational competence) (Fig. 4).

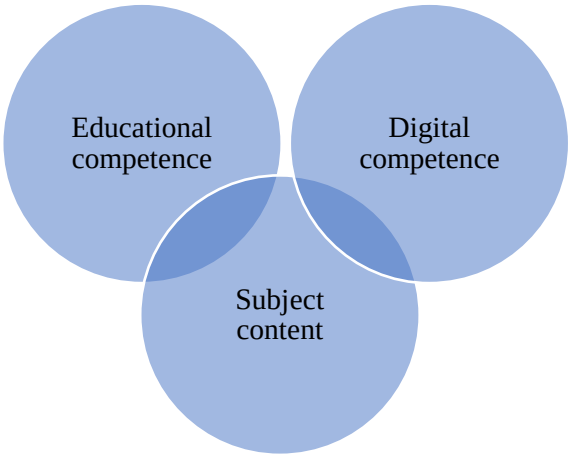

Figure 4. **Links between educational and digital competences through the content of study subjects**

Conclusions

Higher education lecturers should be provided with the conditions for continuous professional development to reflect the principles of lifelong learning. The increasing drive for internationalisation and the growing competition to attract and retain students make the development of digital competences of lecturers a top priority. This is highlighted not only by international documents and also by the conducted research studies. The development of digital competence of lecturers and its realisation through the development of digital content of study subjects depends to a large extent on the personal

attitude, disposition, available time resources, the support received for the acquisition of new digital tools and partly on the specificity of the subject. Although students are ready for and value digital content as an element of quality education, lecturers should be more courageous and diversified in the way they teach their subjects and in the way they offer their studies to society.

The analysis of the survey results shows that lecturers who have developed digital learning tools and thus digitised the content of their courses identify the most important competences as information technology competence (61.4%) and that of continuous development (56.8%). This shows once again that lecturers first need to overcome their fear of technology and master the tools they will use to digitise their content and diversify their studies. Lecturers also identified communication competence (47.7%) and didactic as well as evaluation competences (45.5%) as important. This shows that the development and use of digital tools require not only knowledge of the different tools for digitisation but also knowledge of the didactic purposes for which they can be used and the learning objectives they can be used to achieve. Therefore, the content of the subject is the first to be digitised through the selection of the appropriate tools for the didactic objectives.

Lecturers, when evaluating the components of their enhanced competences (evaluation and development of professional performance, modelling and implementation of the educational process, evaluation of students' progress and achievements, teamwork, and leadership), highlighted the following points which are of utmost importance in digital learning tools. These include the use of active methods, the development of collaborative and reflective tasks for students' independent learning, the reading of students' motivation to learn through tasks and assessment strategies, the measurement of the achievement of objectives and students' results, how to assess individual or group student performance, etc. All this shows once again that educational competence is the basis for the development of digital learning tools. For educational/didactic solutions, digitisation or IT tools are chosen. Therefore, it could be argued that there is a need for the development of educational competence through the digitisation of the content of study subjects and that this should be done systematically and continuously.

Bibliography

1. Arthur-Nyarko, E., Agyei, D.D., Armah, J. K. (2020). Digitizing distance learning materials: Measuring students' readiness and intended challenges. Education and Information Technologies, 25, 2987–3002. DOI 10.1007/s10639-019-10060-y
2. Carretero Gomez, S., & Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, EUR 28558 EN, Publications Office of the European Union, Luxembourg. doi:10.2760/38842 (online). *Scribbr*. https://op.europa.eu/en/publication-detail/-/publication/3c5e7879-308f-11e7-9412-01aa75ed71a1/language-en
3. Ericsson K. A. (2008). Deliberate practice and acquisition of expert performance: A general overview. *Academic Emergency Medicine*, 15, 988–994.
4. Evers, A., & Van der Heijden, B. I. J. M., & Kreijns, K., & Vermeulen, M. (2016). Job demands, job resources and flexible competence: The mediating role of teachers' professional development at work. Journal of Career Development, 43, 227–243.
5. Jones, Anne. (2018). Vocational Education for the Twenty-First Century. The University of Melbourne. https://melbourne-cshe.unimelb.edu.au/__data/assets/pdf_file/0011/2845775/Final-Anne-Jones-paper1.pdf
6. Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC) *Scribbr*. https://eur-lex.europa.eu/eli/reco/2006/962/oj
7. Retnowati, T. H., &Mardapi, D., & Kartowagiran, B., & Hamdi, S. A. (2021) Model of Lecturer Performance Evaluation: Sustainable Lecturer Performance Mapping. International Journal of Instruction, 14, 83–102. DOI 10.29333/iji.2021.1426a
8. Van Hong, B., & Tuyen, T., & Luong, N. T. (2018). Teaching Capacity of Technology Teachers: Applying in the Training Program of Technology Teacher in Vietnam. American Journal of Educational Research, 6(12), 1662–1667.

9. Wei, W., Haiwang, L., Yenchun, J. W., Mark, G. (2023). Disconfirmation effect on online reviews and learner satisfaction determinants in MOOCs. Education and Information Technologies. 28:15497–15521 https://doi.org/10.1007/s10639-023-11824-3
10. Wieland, M., & Michael, L. (2023) Understanding intention and use of digital elements in higher education teaching. Education and Information Technologies, 28, 15571–15597 https://doi.org/10.1007/s10639-023-11798-2.