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Corporate Digital Responsibility New Challenges to the Social Sciences

Abstract

Contemporary practitioners and scientists more and more frequently highlight the extraordinarily rapid process of implementation of new technologies – including those based on artificial intelligence – and unpredictable consequences of such actions. Therefore, it is important to be an active participant in the debate on the relation between human and modern technologies, a debate based on interdisciplinary scientific knowledge. The article refers to selected ideas related to knowledge management, organisational learning, knowledge area, or innovation environment. The challenge which social science researchers face, next to examining the theoretical aspects, is the application of various calculation methods and new technologies to make quicker and easier decisions in social contexts – with regard to various groups of people, e.g. employees, customers, or voters. Apart from the new methods, another serious challenge is to raise social awareness regarding the digital responsibility in certain groups such as managers or, more generally, employers and employees. The responsibility of the elite and scientific authorities should consist in instilling awareness in one another and approaching the new phenomenon with care. Potential threats may completely change our civilisation. The presented discussion is based on literature study which included selected theories and reports of research centres and scientific bodies. A particularly interesting case study discussed in this article includes TOP CDR initiative and a report prepared by SW RESEARCH agency in cooperation with Procontent public relations and digital marketing agency. The conclusions of this report indicate that corporate digital responsibility (CDR) may be a pioneering area for in-depth empirical studies. The nature of the topic, despite being clearly related to

sociology, requires interdisciplinary approach and cooperation of numerous circles, not only scientific ones.

K e y w o r d s: corporate social responsibility, corporate digital responsibility, technology, artificial intelligence

Towards Corporate Digital Responsibility – Future or Nowadays Challenges?

Contemporary scientific authorities and, more and more frequently, political leaders highlight new kinds of threats to global labour market posed by automation and mass implementation of solutions based on artificial intelligence (AI). Development of new technologies, robotics, and process automation threatens current workplaces in both industry and the service sector. These processes may create social unrest, and their consequences are difficult to foresee due to the dynamic nature of their progression.

The aim of the article is to characterise new challenges in corporate digital responsibility and new research areas which emerge in that field for social sciences. The author will identify certain theoretical aspects and potential consequences related to threats posed by the development of new technologies, artificial intelligence, automation, and digitalisation of social environment on a large scale. Selected thematically, relevant reports of scientific bodies, employers' organisations, and companies collaborating with scientific circles will be analysed. The author will analyse in particular the TOP CDR initiative, which is the first project of this kind in Poland, focused on digitally responsible enterprises.

A Few Words about Methods

The analysis is based on theoretical considerations substantiated by selected research data. The theoretical themes referred to are part of the author's selective attempt to indicate significant areas of possible future research. The scope of the analysis is largely based on literature study of selected concepts and is therefore significantly limited. All empirical remarks refer to existing data, reports of research centres and scientific bodies. The analysis will also include the TOP CDR report prepared by SW RESEARCH agency in cooperation with Procontent public relations and digital marketing agency.

Development of Technologies in the Field of Artificial Intelligence – Responsibility and Challenges in Social Context

For many years scientists and experts from virtually all scientific fields have been discussing the relationship between human and technology, which is developing at an increasing rate. These considerations include not only new ways of learning or human reaction to resulting changes in the reality, but also possible social processes which occur or will occur in the future due to technologisation and increasing presence of machines and robots in everyday life.

The challenge which social science researchers face is the application of various calculation methods and new technologies to make quicker and easier decisions in social contexts with regard to various groups of people, e.g. employees, customers, or voters. This allows to gather data faster and identify digital traces of human activity – either in social networks or in information obtained during behavioural studies using mobile phones. Access to this type of data provides the ability to stimulate various behaviours. Specialised software used on this kind of data has been perfected at an increasingly fast rate since the 1990s towards study of methods of AI operation. Initially, data compilation software was created to build databases using a specific type of reasoning mechanisms. Nearly 70 years have passed since the first widely recognised definition of artificial intelligence was presented by Alan Turing in 1950. At the time, artificial intelligence was understood, for the purpose of the conducted experiment, as an ability of a machine to perform cognitive tasks effectively without making human interrogator realise that that the respondent is a machine (Turing, 1950). Nowadays, programmers are focused on the creation of intelligent behaviour patterns which may be utilised in computer software. The goal is to develop a model allowing machine to imitate sophisticated human manifestations of intelligence: making decisions under uncertainty, analysis and synthesis of natural languages, conducting logical reasoning, diagnosis, expertise and participation in logic-based games such as chess. Machines already have achieved the ability to learn and perfect their behaviour on the basis of new experience. Using algorithms and specific data, the machines can, through the process of induction, transition from supervised learning to unsupervised learning (Russell & Norvig, 2003).

> More and more often, people are being replaced by machines, devices, and appropriate software, all through learning specific forms of response based on the output data. Nowadays, the ethical question should be a top priority for scientists, because many people might be really hurt by these algorithms (Suchacka & Horáková, 2019, p. 917).

This has specific consequences – chances and threats. At the threshold of revolution initiated by introduction of artificial intelligence into various areas of socioeconomic life, an increasing number of socially sensitive practitioners and scientists call for the need to create a complex strategy of AI development. The analysis of selected AI development programmes conducted by Digital Poland Foundation in 2018 points to differences in approach to this matter between various countries. Depending on the government's policy, emphasis is placed on retaining scientific leadership and development of basic research around AI (France), ensuring national security, order and monitoring behaviour of the citizens (China), maintaining leadership in robotics, increasing the level of industrialisation and supporting ageing society (Japan). The report characterises world's most prominent centres of innovation and highlights the need to promote economy based on knowledge, cooperation, and sharing experience with the support of the regional and national level authorities (Digital Poland Foundation, 2018). The aware and responsible decision-makers should create conditions favourable for close integration of the worlds of science and business and accelerated commercialisation of the results of their cooperation.

The responsibility of the elites and scientific authorities should consist in raising awareness about AI and taking the new phenomenon seriously. Potential threats may completely change our civilisation. The research conducted on the matter is still focused primarily on technical and IT issues, despite the fact that great minds of our times like Bill Gates, Elon Musk, and Stephen Hawking have been warning us against development of a model of artificial intelligence able to continuously improve itself. It is difficult to image what is becoming the reality – machine surpassing human.

> The most controversial is the use of artificial intelligence in the army [armed forces], from rockets or jets to all kinds of infrastructure control systems. At this stage, it is assumed that people are in control, not threatened by computers deciding anything themselves. It will be this way until the artificial intelligence begins to modify its goals. Even if it is possible for the machine to become self-conscious, it will still have to set tasks for itself and find a justification for them, and that part is not immediately obvious. At the moment, intelligent technologies assist us with acquiring knowledge quickly, learning new behaviors outside the traditional system of education, which, however, should not be completely eliminated. A constant reflection, inherently sociological, should accompany these technological changes, for the algorithms behind ethical actions are the very traits of humanity and it is quite difficult to assume that the machine will accept them or will develop them itself without error of proper access path (Suchacka & Horáková, 2019, p. 919).

From the very beginning, the development of artificial intelligence has been examined with disregard for the notion of self-awareness of a machine. This may have dramatic consequences at the onset of final revolution when AI will combine knowledge from three areas of science encompassing mechanisms of matter, life, and mind. It is a matter of time before machine outsmarts and surpasses human intelligence.

Review of Selected Ideas and Initiatives Related to the Impact of Technology on Changes in Global and Local Labour Markets

Setting aside the considerations on futuristic visions of artificial intelligence seizing control over the world, it can be assumed with certainty that the most obvious area of contact between human and machine is the workplace. At work one can observe how changes in production, way of completing certain tasks, or use of more complicated tools can directly affect the entire professional life. This entails the need for continuous learning and, in order to meet that necessity, creation of human capital management strategies. Staff resources, knowledge accumulated by the employees, access to information, and ability to skilfully use it are factors which largely determine the success of contemporary companies. A German researcher Peter Drucker emphasised that traditional importance of current economic resources – labour, land, and money – gradually decreases. Slowly, the income from these sources is losing significance, and the only – or at least the main – sources of wealth are information and knowledge. "In fact whichever traditional industries managed to grow in the last 40 years did so because they restructured themselves around knowledge and information" (Drucker, 1999, p. 149). According to British analysts, "Traditional managerial systems have been developed to persuade bored people to keep their noses to the grindstone. But how do you manage people who keep the company's most valuable resources in their heads? […]" (Micklethwait & Wooldridge, 2000, p. 135).

Moreover, according to an American scholar Peter Senge, contemporary companies owe their competitive edge to their ability to learn and constantly using that ability. Senge points out that:

> At the heart of a learning organization is a shift of mind – from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something "out there" to seeing how our own actions create the problems we experience. A learning organization

> is a place where people are continually discovering how they create their reality. And how they can change it (Senge, 2004, p. 28).

Undoubtedly, such an approach, in combination with technological development, facilitates achieving high efficiency indicators and economic growth rate. This long-term attitude derives advantages from emphasising the ability of problem identification, skilful adaptation to conditions of the surroundings and innovativeness based on knowledge management. Japanese scholars noted that properly designed knowledge management system allows a company to acquire, analyse, and use knowledge to make quicker, wiser, and better decisions leading to the achievement of competitive advantage.

> The main issue related to knowledge-based management is the conversion of the so-called tacit knowledge – personalised and rooted in individual's experience, skills, intuition and values he or she embraces – to accessible, explicit knowledge, usually codified (Nonaka & Takeuchi, 2000, p. 9).

Although their considerations were basic and covered organisation and public undertaking, new ideas referring to broader view on the matter started to develop at that time. These ideas referred to knowledge-based economy development characterised by emergence of regional innovation systems (Cooke, 1997), innovative milieus (Matteaccioli, 2006), clusters of innovation (Porter, 1998) and learning regions (Florida, 1995) for which paradigm of geographical proximity is very significant (Rallet, 2007). Particularly interesting were the analyses conducted in the context of regional networks facilitating formation of knowledge region. An example of such area in Poland is Silesia, which is the most industrialised area of the country and which is undergoing extraordinary metamorphosis into a learning region (Suchacka, 2014).

A special role in this process is played by universities and research institutions which attract creative individuals and collaborate in creation of network of connections with economy:

> Universities are producers of knowledge and technology. This is a very important function and no other institution of the State can replace them in that role. In the 19th century, Humboldt was the first one to suggest that such task should be given to universities. Universities combine immense potential of highly-educated scholars. Provided that they are properly equipped with tooling and test equipment, a legion of young doctoral student minds is able to complete every research task. Of course, large corporate laboratories and government science bodies conduct research on a massive scale and frequently are leaders in new technologies and factories of new inventions. However, it is university with its freedom of scientific

> research and great potential of doctorate students which became breeding ground of new ideas and theories taking the lead on the scientific frontier in terms of boldness and originality (Galwas, 2010, p. 11).

Undoubtedly, the pace of contemporary economic changes is an effect of unprecedented acceleration of technological innovation development. In these dynamic times, real social responsibility, not only out of concern about company's good image, is often forgotten.

Corporate Social Responsibility (CSR) and Corporate Digital Responsibility – Origin and Relationships

Contemporary managers are aware that technological and digital development is unavoidable. Their awareness is changing also due to recognition of specific threats. Sense of responsibility unites certain groups of entrepreneurs, scientists, and decision-makers. Specific practical actions, studies, and theoretical academic works were an answer to the rising concerns. Already in the 1960s, the idea of sustainable development gave impulse for a new approach to solving social, economic, and environmental issues. This idea is the source of corporate social responsibility (CSR). The main principles of this approach are related to maintaining balance in business activity between three kinds of capital – economic, human, and natural. This correlates with an increasingly evident civil pressure and growing trend of business self-regulation. Transparency of operation, clarity of rules applied in practice to employees, customers and contractors, as well as participation in major local community events are becoming important for a large portion of the society. Expectations of various social groups – employees and customers, providers and contractors, environmental and social organisations, government and local authorities – are becoming a challenge for many managers. This leads to in-depth analyses, cooperation of certain circles, shaping new kinds of relationships between natural environment, human and business. All social forces more and more often agree that in order to survive and develop they need each other. In long-term perspective, this leads to changes in social awareness and perception of social environment by entrepreneurs. The demands placed on contemporary business are not only related to meeting specific customer needs, but also to preventing any damage or degradation of natural and social resources. Although corporate social responsibility is a voluntary activity of an enterprise, more and more frequently this activity takes place in the context of a wider process – corporate self-regulation. The manifestation of this process is the appearance of the so-called good practices. Those include actions undertaken to reduce corruption and fraud, and to increase

transparency of rules and principles which guide entrepreneurs. Integrity of words and actions, concern for customer trust, investors' attention, and employees' pride are proof of social sensibility of an enterprise. Spontaneous practices, which have been applied in this matter for a long time, have been formalised in two EU documents which are considered as archetypal set of guidelines for future development – Green Paper on CSR (2001) and White Paper on CSR (2006). In response to these publications, the interested enterprises concordantly endeavoured to voluntarily integrate and create new forms of cooperation between business and public authorities.

> Various studies show that CSR can have different dimensions: internal – aimed at employees in the form of comprehensive human resources policy, social package, greater participation in management – and external – aimed at the surroundings of an enterprise, mainly at local community and non-governmental organisations. […] Businesses have strategies and plans which are not always in line with expectations of the local community. The unaware model is more common in smaller enterprises of local nature which perfectly know their surroundings, its problems and their solutions are authentic and sincere (Gawron & Suchacka 2018, p. 56).

Despite continuing absence of developed and implemented standards, attempts are being made to create uniform and generally accepted procedures which would cover all areas of responsibility and suggested procedural instruments. Following the technological and digital development in recent years, more attention is given to socially responsible creation and implementation of innovation. Managers extend their knowledge in that matter by participating in special educational programmes and studies. Higher education institutions continuously strive to improve the level of educational services to train high-grade specialists with desirable abilities and professional skills, regardless of their location. Managers, as an extremely busy group of people, eagerly reach for new forms of acquiring knowledge such as e-learning (Morze, 2016).

> For providing the educational services, institutions must create an open information and educational e-environment, which will be used in open learning: an innovative system of evaluation of scientific research, management, and implemented remote access to educational resources, an integral part of which is an e-learning system (Morze & Buinytska, 2019, p. 12).

Corporate Digital Responsibility (CDR), which in recent months has been taking formal shape, is a new initiative within social responsibility. It follows the trend of improvement of knowledge related to responsibility in business. CDR

means the awareness of duties binding the organisations active in the field of technological development and using technologies to provide services. Generally, this approach consists in trying to achieve balance and lead technological development in a direction in which technology will have positive impact on the surroundings.

Initiators of this new approach to social responsibility recognise chances and risks presented by deployment of new technologies. New technologies save time, offer new possibilities and improve the standards of living in general. On the other hand, they pose a threat by facilitating new kind of addiction or exposing to invasive and aggressive practices of individuals who exploit sensitive data and destroy trust between people. The dynamic development of technologies threatens also global labour market due to automation and mass implementation of solutions based on artificial intelligence. Jobs are disappearing both in industry and the service sector. This creates social unrest and may even influence changes in political and educational systems. Experts and scholars aware of this dynamic process emphasise that businesses and employees have far less time to thoroughly examine social consequences of ongoing implementations related to digitalisation.

In parallel with these changes attempts are made to introduce systemic regulations and provide support for persons who have lost their jobs as a result of automation and artificial intelligence. An example of these efforts is the reform of the European Globalisation Adjustment Fund adopted by the European Parliament in January 2019. The main task of the fund, which was renamed to the European Fund for Transition (EFT), is to address the negative impact of globalisation and technological changes. Provided that certain criteria are met, companies based in a Member State of the EU which are laying off employees can apply for support from the EFT.

The survey of main sources of fear of average Americans conducted by Chapman University (USA) reveals that the respondents were more afraid of people in the workforce being replaced by machines than death. In the report "American Fear Survey" (2018), these fears placed 48 and 54, respectively. More people realise that in the near future robots will be able to complete the same tasks as humans. The transition to automation and robotisation has already gathered considerable momentum. In Japan, the USA, and South Korea, there are already several hundred robots operating on production lines per 10,000 workers. The man-hour costs of human work on production line are also rising.

The fears that technology will destroy more jobs that it will create are on the rise. New positions of employment such as drone operator, social media administrator, or autonomous vehicle engineer are emerging. Robots like Da Vinci, which serves as a surgeon's assistant, help save human lives. Therefore, the main challenge is not to oppose the process of digitalisation, but to skilfully adjust the labour market, effectively use technologies, ensure data security, and improve employees' qualifications, especially with regard to digital competences.

Polish people, compared to other European nations, demonstrate low awareness of threats posed by automation. The study conducted in 2018 by Pew Research Center show that only 24% of the respondents believe that within the next 50 years human workforce will be replaced by robots and computers. In Greece, 52% of the respondents shared this view. The survey was performed in 9 countries from 21 May to 10 August 2018 and in the United States in 2015, 2016, and 2017 on a group of 9,670 respondents. The potential inability to find another job was what respondents feared the most as this may lead to social stratification in terms of income. The majority of the participants believe that the responsibility for preparing the workforce for changes rests on the government. Polish respondents also indicated schools (62%) and employers (46%).

In the era of dynamic digital development, implementation of business targets is executed in a responsible manner. This is especially emphasised by large corporations as part of their PR campaign. Corporate digital responsibility is focused on ensuring that new technologies and, most importantly, data are used productively and wisely. A manifestation of this is the creation of comprehensive framework on data security, training programmes which prepare employees to managing digital information in difficult situations. A serious approach to concerns of customers, employees, and partners can be beneficial for a company.

The main areas of corporate digital responsibility, within which certain measures are taken, focus on potential changes. The measures consist primarily in changing business models – creating new ones as a response to emerging technological products. This is accompanied by changes in the work arrangement: increase in intensity of teleworking or formation of virtual teams. Such changes are accompanied by an influx of data and content in the Internet as well as a rapid improvement of required digital competences. Steps taken by employers with regard to CDR should include allowing employees to obtain necessary digital competences. However, this responsibility does not exclude or is even compliment by taking actions such as:

- ensuring that employees can rest through disconnection from digital world of the company,
- ensuring that traditional forms of social and inter-employee relationships are maintained,
- preventing replacement of traditional forms of contact with virtual communication,
- taking interest in and defining standards ensuring protection of the data processed within a company,
- fighting against digital addiction and breakdown of social relations caused by technological development (TOP CDR programme document, 2018).

In practice, these actions are already taken by many companies which are aware of the problem and include this kind of goals in their strategies of socially responsible business.

TOP CDR Initiative – Analysis of Assumptions and Survey Report

In spring 2019, as a result of cooperation between SW RESEARCH agency and Procontent public relations and digital marketing agency, a decision was made to start an initiative to promote CDR and conduct a survey among employers on corporate digital responsibility. The programme document defines main goals of Top CDR initiative:

- preparation of good practices document based on surveys of employees and employers,
- rewarding good practices within CDR and promotion of good CDR practice models,
- communicating opportunities and threats related to technological development which should be covered by CDR regulations (TOP CDR programme document, 2018).

The efforts are supported by the Council of Experts which is composed of representatives of government institutions, technological companies, non-governmental organisations (NGO), and universities specialised in the field of new technologies development. Under the programme, an online platform will be created to gather in one place the debate on CDR in Poland, foreign reports, events, and news related to the notion of CDR. The results of the CDR opinion survey conducted in May 2019 were used to compile the "CDR in Poland" report. During a special debate, experts expressed their opinion on the results. There is also a plan to develop a guide to good CDR practices and to organise a "Technologically Responsible Company" competition. Companies winning that title should be characterised by compliance with good digital practices, concern for safety of their employees in the Internet, and organisation of learning activities rising CDR awareness of their employees.

The "CDR in Poland" report presenting employees' fears related to automation and robotisation of work is particularly interesting. The survey was conducted at the turn of May and June 2019 by SW RESEARCH agency using computer-assisted web interviewing (CAWI) via SW Panel available on-line. The study group consisted of 1,010 participants from companies employing more than 50 people. The majority of the respondents were women (53.1%). The majority of the respondents were in 25–34 (36.4%) and 35–49 (32.7%) age groups. Respondents with higher (54%) and secondary education (40.1%) were dominant in the study group.

Survey questionnaire was prepared in cooperation between SW RESEARCH and Procontent agencies. It consists of 5 Likert-type scale questions in which respondents could express their opinion on specific issues and questions concerning

personal data. The survey is an analysis aimed at initial investigation of the problem and may be a part of preparation for serious scientific research.

The results yielded by the survey are quite interesting. One of three respondents believe that automation of work through robotics will force him/her to professionally retrain or change job within the next 10 years. The opposite opinion was expressed by 40% of the respondents which indicates low awareness of the problem or a complete lack of such danger. The latter assumption seems to be confirmed by high percentage of respondents (60%) noting lack of staff reduction due to implementation of new technologies or automation in the last 3 years. However, almost one third of the participants admitted that such reduction had taken place in their workplace. Particularly interesting were the results concerning activities outside working hours: reading e-mails, messages on corporate messengers and social networking profiles managed by their company. Only 16% of the respondents admitted that they dedicate some of their free time to such activities every day. One of four participants do it several times a week and one of four respondents stated that they do not use corporate messengers after work at all. The authors of the survey asked also about associations with the phrase "digitally responsible company" allowing to choose 3 from provided options. The majority of answers (more than 40%) pointed to conducting training related to developing digital competences helping to consciously use devices connected to the Internet, be able to distinguish fake news and propaganda activities from legitimate information. Almost 40% of the respondents indicated also enabling employees to obtain necessary digital competences to prevent job losses due to automation. The participants were somewhat divided on the issue of taking advantage of technological improvements brought by automation and robotisation. Nearly one third of the respondents (30.5%) stated that they do not want help from robots and prefer to use services provided by humans. The majority of the respondents with the opposite opinion would like to use a robot to complete household chores on everyday basis and one in four participants would like to own a "smart house" or be served by an "automatic cashier."

According to the survey results, the majority of the participants, provided that they are not aware of any danger from automation, would eagerly chose to benefit from technological improvements, whilst not excluding human contact. Employers are expected to enable their employees to improve their digital competences and provide training related to that matter. The data indicate that there is no relationship between these answers and the educational level, age, or gender of the respondents.

In conclusion, it should be stressed that the conducted survey was not strictly scientific and is preparatory to further and more detailed analyses. There is an evident need for more in-depth investigation of the topic, as evidenced by consulting companies showing particular interest in this issue.

Conclusions

The development of modern technologies, robotics and process automation creates new kinds of threats. The impact of technology on social life is becoming so dynamic that human can no longer anticipate and remedy the consequences. As a result of specific social trends, more and more companies begin to devote attention to the need to take measures and initiate cooperation between scientific, political, and economic circles. Raising social awareness with regard to the impact of technologies – especially the latest ones related to artificial intelligence – on social life and people is a great challenge for many important circles and authorities. The actions taken thus far were basically grounded upon economic motives and constituted an element of PR campaign. Numerous scientific trends such as theory of sustainable development, theories of knowledge management, concepts of learning organisation and region, creation of innovation networks and innovation environments supported and inspired companies to take proper care of their human capital and build social capital in the broader sense. This was facilitated also by the concept of corporate social responsibility (CSR) which in recent years has been extended with corporate digital responsibility (CDR). This new trend of entrepreneurs' interest is a rich area for profound empirical studies. The nature of this topic, despite being of clearly sociological origins, requires an interdisciplinary approach and cooperation of numerous circles, not only scientific ones.

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Małgorzata Suchacka

Corporate Digital Responsibility – nowe wyzwania dla nauk społecznych

Streszczenie

Współcześni praktycy i naukowcy coraz częściej podkreślają niezwykle dynamiczny proces wdrażania nowych technologii – w tym także tych opartych o sztuczną inteligencję – oraz trudne do przewidzenia konsekwencje tych działań. W związku z tym warto być aktywnym członkiem debaty na temat relacji człowiek – nowoczesne technologie w oparciu o wiedzę naukową o interdyscyplinarnym charakterze. W artykule odwołano się do wybranych koncepcji zarządzania wiedzą, budowania „organizacji uczącej się", regionu wiedzy czy środowiska innowacyjnego. Wyzwaniem dla badaczy z zakresu nauk społecznych obok pogłębiania aspektów teoretycznych jest fakt wykorzystania różnych metod obliczeniowych oraz nowych technologii w celu szybszego i łatwiejszego podejmowania

decyzji w kontekstach społecznych – odnośnie różnych grup ludzi, np. pracowników, klientów, czy wyborców. Poza nowymi metodami badawczymi poważnym wyzwaniem jest budowanie świadomości społecznej w zakresie cyfrowej odpowiedzialności w określonych grupach, jak chociażby menadżerowie, czy szerzej pracodawcy i pracownicy. Odpowiedzialność szerokich elit i autorytetów naukowych powinna polegać na wzajemnym uświadamianiu, a także poważnym traktowaniu nowego zjawiska. Potencjalne zagrożenia mogą całkowicie odmienić naszą cywilizację. Przedstawione rozważania oparte są o studia literaturowe uwzględniające wybrane teorie oraz raporty ośrodków badawczych i instytucji naukowych. Szczególnego rodzaju studium przypadku stanowi inicjatywa TOP CDR oraz omówiony w artykule raport przygotowany we współpracy agencji badawczej SW RESEARCH oraz agencji *public relations* i *digital marketing* Procontent. Wnioski z tego raportu dowodzą, że cyfrowa odpowiedzialność przedsiębiorstw *corporate digital responsibility* (CDR) stanowić może pionierski temat do wielu pogłębionych studiów empirycznych. Natura tematu mimo wyraźnie socjologicznych źródeł wymaga podejścia interdyscyplinarnego i współpracy wielu środowisk – nie tylko naukowych.

S ł o w a k l u c z o w e: społeczna odpowiedzialność biznesu, cyfrowa odpowiedzialność biznesu, technologia, sztuczna inteligencja

Małgorzata Suchacka

Корпоративная цифровая ответственность – новые вызовы социальным наукам

А н н о т а ц и я

Современные практики и ученые все чаще отмечают чрезвычайно быстрый процесс внедрения новых технологий, в том числе основанных на искусственном интеллекте, и непредсказуемые последствия таких действий. Поэтому важно быть активным участником дискуссии о связи между человеческими и современными технологиями, дискуссии, основанной на междисциплинарных научных знаниях. В статье рассматриваются отдельные идеи, связанные с управлением знаниями, организационным обучением, областью знаний или инновационной средой. Проблема, с которой сталкиваются исследователи в области социальных наук, наряду с изучением теоретических аспектов, заключается в применении различных методов расчета и новых технологий для принятия более быстрых и простых решений в социальных контекстах - в отношении различных групп людей - например, сотрудники, клиенты или избиратели. Помимо новых методов, еще одной серьезной проблемой является повышение социальной осведомленности о цифровой ответственности в определенных группах, таких как руководители или, в более общем плане, работодатели и работники. Ответственность элиты и научных авторитетов должна заключаться в том, чтобы привить друг другу понимание и осторожно подходить к новому явлению. Потенциальные угрозы могут полностью изменить нашу цивилизацию. Представленная дискуссия основана на изучении литературы, которая включала отдельные теории и доклады исследовательских центров и научных учреждений. Особенно интересный пример, обсуждаемый в этой статье, включает инициативу TOP CDR и отчет, подготовленный агентством SW RESEARCH в сотрудничестве с агентством по связям с общественностью и цифровым маркетингом Procontent. Выводы этого отчета показывают, что корпоративная цифровая ответственность (CDR) может быть новаторской областью для углубленных эмпирических исследований. Характер темы, несмотря на то, что она явно свя-

зана с социологией, требует междисциплинарного подхода и сотрудничества многочисленных кругов, не только научных.

Ключевые слова: корпоративная социальная ответственность, корпоративная цифровая ответственность, технологии, искусственный интеллект

Małgorzata Suchacka

Responsabilidad digital corporativa: nuevos desafíos para las ciencias sociales

Resumen

Los profesionales y científicos contemporáneos destacan cada vez con mayor frecuencia el proceso extraordinariamente rápido de implementación de nuevas tecnologías, incluidas las basadas en inteligencia artificial, y las consecuencias impredecibles de tales acciones. Por lo tanto, es importante ser un participante activo en el debate sobre la relación entre las tecnologías humanas y modernas, un debate basado en el conocimiento científico interdisciplinario. El artículo hace referencia a ideas seleccionadas relacionadas con la gestión del conocimiento, el aprendizaje organizacional, el área de conocimiento o el entorno de innovación. El desafío al que se enfrentan los investigadores de ciencias sociales, además de examinar los aspectos teóricos, es la aplicación de varios métodos de cálculo y nuevas tecnologías para tomar decisiones más rápidas y fáciles en contextos sociales, con respecto a varios grupos de personas, p. empleados, clientes o votantes. Además de los nuevos métodos, otro desafío serio es aumentar la conciencia social sobre la responsabilidad digital en ciertos grupos, como los gerentes o, más en general, los empleadores y los empleados. La responsabilidad de la élite y las autoridades científicas debería consistir en inculcar la conciencia mutua y abordar el nuevo fenómeno con cuidado. Las amenazas potenciales pueden cambiar por completo nuestra civilización. La discusión presentada se basa en un estudio de literatura que incluyó teorías seleccionadas e informes de centros de investigación y organismos científicos. Un estudio de caso particularmente interesante discutido en este artículo incluye la iniciativa TOP CDR y un informe preparado por la agencia SW RESEARCH en cooperación con la agencia de relaciones públicas y marketing digital Procontent. Las conclusiones de este informe indican que la responsabilidad digital corporativa (CDR) puede ser un área pionera para estudios empíricos en profundidad. La naturaleza del tema, a pesar de estar claramente relacionada con la sociología, requiere un enfoque interdisciplinario y la cooperación de numerosos círculos, no solo científicos.

Palabras clave: responsabilidad social corporativa, responsabilidad digital corporativa, tecnología, inteligencia artificial

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Building Learning Power and Critical Thinking in the Field of Online Tutoring

Abstract

This article is first of all a theoretical study covering the whole area of critical thinking. The development of critical thinking should be supported by new information technologies. The text only points to some possibilities of using information technologies in the concept of building learning power and critical thinking.

The development of information technologies gives us new tools and forms to support the teaching/learning processes. Many of the new tools of digital technology pose new teaching challenges for the teacher. However, there appears a question that is not only worth asking, but also worth answering: how to improve the teaching/learning process with the help of the new educational opportunities, so as to strengthen it and not to disturb it at the same time? A tutor-teacher has to search and to find out – in the area of these educational opportunities that belong to him or her and his or her pupils – such optimal solutions that neatly combine both the elements of traditional teaching and the ones that are typical of distance learning. This gives new opportunities for effective online tutoring when the teacher is available online for any of the students at a specific time that is perfectly convenient for each of them.

K e y w o r d s: Guy Claxton, building learning power, online tutoring, critical thinking

Introduction

New IT technologies introduced to schools should develop in parallel with the accompanying methodological reflection on how to strengthen the interests of young people with the curricular topics of education, how to teach critical and independent thinking, argumentation, participation in dialogue, and social communication. In this article, I present the problem of developing the potential of critical thinking and learning with the possibility of increasingly widespread use of information technology tools.

Critical thinking should be understood as acquiring numerous competences and improving skills related to the broadly understood logical culture through proper handling of the spoken word, but above all the word operated in the multimedia space. In addition, critical thinking is also mastering the ability to use the principles of indirect justification of beliefs or assumptions, distinguishing the relationship between the field of language characters and the field of thoughts and denotations and acquiring knowledge of the principles of rhetoric, as well as skilful conduct and participation in a discussion or thematic dispute. If the critical thinking areas are supported by new IT tools, then certainly the educational reality will take on a different character than it is in traditional education that evidently promotes student passivity.

If one wants a good student, one has to do something to make the student want to learn. However, without taking into account new technologies, which the student often has better access to than what the school offers, it is difficult to overcome educational barriers and stereotypes about the irreplaceable role of the teacher in the education of young people. In this article, I am only trying to outline the possibilities of supporting the development of the potential of critical thinking and learning with IT tools. Being aware of the importance of continuous improvement of the student's critical thinking skills (which is not merely about adopting the attitude of a skeptic, who doubts anything and everything, but about skillfully building one's own knowledge system), I will only pay attention to some areas of skills that are important in this field of education (Siemens, 2005)[1]:

- understanding the meaning of basic terms from individual knowledge ranges;
- skills in formulating basic humanistic and social problems with adjoined solution proposals;

[1] According to Siemens, the concept of connectivism – combining the ideas of constructivism, cognitivism, and behaviourism – is a proposal to create knowledge by the learner through attempts to understand their own experiences and create meanings. Behaviourism and cognitivism perceive knowledge as something external to the learner; thus, they recognise the process of learning as an act helpful in knowledge integration. In teaching, the connectivist approach allows for the inflow of new pieces of information so as to recognise them as either important or invalid, whereas those that were important yesterday can be put subject to contemporary criticism.

- the ability to formulate questions;
- indicating a special place for the humanistic and social search for the truth;
- formulating arguments and skilful searching and selection of examples supporting argumentation, but also the ability to indicate counter-arguments;
- understanding the meaning of logic in correct thinking and expressing thoughts;
- gaining and having knowledge on the most common sources of misunderstandings and proposing ways to overcome them;
- having knowledge about various types of defining and avoids errors in defining and avoiding categorical errors;
- mastering the rules of conducting discussions;
- distinguishing the thesis from the adopted assumptions;
- formulating the subject of one's own speech and mastering the skills of proper preparation for speaking;
- formulating a plan of written work and oral expression (in accordance with the principles of rhetoric);
- referring to the positions and arguments convergent and inconsistent with the presentation of own decisions in the issues being addressed;
- gaining independence in the development of specific problems contained in education programmes.

Participation of the learners in the process of multimedia social communication is a good test of their ability to combine different contents of education with their own experience. Creative building of social relations depends on the acquired awareness of co-responsibility for participating in the life of the local environment, as well as the national and international community. An important question – one that should be asked constantly – concerns the adopted educational standards, reflecting the contemporary challenges posed before the generation of young people. The basic question still remains the same: how many both new and acquired skills will contribute to the success of life expected by the young generation? I do not want to discuss the current state of the currently existing educational standards. What I just want to do is to discuss a few elements supporting the development of the potential of critical thinking, and thus learning, which can be effectively supported by new information technologies in the increasingly proposed form of *online tutoring*. I would like to focus on the fundamental educational problem, which is the willingness to learn and the satisfaction that comes with it.

Using the didactic experience, it can be noticed that effective development of skills and acquiring new competences by the students is possible if they better acquaint themselves with the surrounding reality, which in turn depends on the level of knowledge acquired by them. In view of introducing the students into the multimedia space, the following questions are still important: What competences are needed to equip a young person in so as to prepare them for lifelong learning? How to prepare a student to independently acquire knowledge? What will young persons really need when they complete their school, technical, or

academic education? Answers to these questions have to be seen as determinants of developed education programmes which not only are adequate enough to the needs of people and society but also incorporate access to Internet resources.

The Theoretical Basis of Online Tutoring Rules

Currently, strongly formalised teaching and learning methods, combined with verification and certification, cause stress and shape the negative attitudes of young people. Obviously, the student is not satisfied with passive participation and listening to the content of education presented to him or her. Often not even understanding the importance of specific knowledge ranges at specific stages of education, students want to decide for themselves what, how, and when to learn. They want to be able to choose their individual educational path. They want their education content to be interesting so that they can participate in the ongoing everyday dialogue that refers to and concerns many common things. These are the natural needs of every human being that result from the acquired awareness of their freedom, which is why students openly demand their freedom to make choices about their development. The student expects from the teacher: unconventionality, that is, creativity expressed by the ability to choose the right teaching methods that match the individual style of their personalised work; combining theory and practice; hints on how to deal with the emerging difficulties in the understanding of the surrounding reality. Therefore, a good and even necessary supplement to group and class education is *e-learning* (*blended learning – b-learning*). We use new online tools, and teaching takes the form of *online tutoring*. Videoconferencing is becoming the norm, as well as teaching in virtual classes thanks to the availability of appropriately designed educational platforms. In the last ten years, e-learning has gone through many stages in its development, from a non-targeted and non-interactive tool, through non-simultaneous (asynchronous) text messaging and multimedia communication, to full (synchronous) teaching (Reis, 2010).[2]

Before discussing the areas of students' critical thinking and learning abilities, let me present a few points that, in my opinion, justify the need to introduce individual tutoring based on online tutoring. This type of education, however, cannot be obligatory for all students, but should be an option to be chosen independently. While speaking about the possibilities of developing the potential of (among others) critical thinking, I would like to point to such assumptions that are helpful in the development of tutoring didactics able to function within this

[2] In this regard three stages of e-learning development are distinguished: e-learning 1.0, e-learning 2.0, and e-learning 3.0.

body of education that is supported by distance learning (Smyrnova-Trybulska, 2009; Smyrnova-Trybulska, 2010). In the preliminary elaboration of this problem I will use the theory of multilateral education formed by Wincenty Okon, at the base of which we find the so-called the theory of knowledge components; see: Table 1 (Śleziński, 2000).[3]

Table 1.
Theory of the components of knowledge

Four main components of knowledge		
Expressions defining components of knowledge	Ways of learning	Courses of education
defining	assimilation	feeding
explaining	exploration	problem formatting
assessing	experiencing	exposing
normative	action	practical

S o u r c e: Own work.

The theory of the components of knowledge can be derived from the knowledge defining ways of learning/teaching methods. The four components of knowledge that can be expressed in descriptive, explainatory, evaluating, and normative sentences can be assigned to four ways of learning: assimilation, exploration, experiencing, and action, as well as four learning courses: feeding, problem fromatting, exposing, and practical. In the development of the problem of developing the potential of critical thinking and learning, I also used the taxonomy of motivational, practical, and cognitive objectives developed by Boleslaw Niemierko (Niemierko, 1999) and the *Building Learning Power* concept developed by Guy Claxton, helpful in developing the principles of online tutoring (Claxton, 2001; Wollman, 2013a, pp. 12–104; Gornall, Chambers, & Claxton, 2013; Wollman, 2013b). The concept of developing the potential of critical thinking and acquiring knowledge refers to practical educational activities supporting the student's emotional and cognitive activity and knowledge in the field of natural anthropology.

It is an undeniable fact that in classes conducted online, students work better in an atmosphere of freedom, when they do something of their own free will, when they themselves seek answers to questions asked and develop their own interests at the same time, which motivates them to be independent in their thinking. Therefore, the problem of the development of critical thinking and learning should be analysed in at least four aspects: emotional, cognitive, strategic, and social.

[3] The theory of the components of knowledge has served me earlier to develop didactics of philosophy.

The first of these is not essential for developing critical thinking, just like the other three aspects, but it performs an important function of directing the emotions and self-determination of the will to the effort involved in knowledge acquisition activities.

Four Aspects of the Problem of Developing the Potential of Critical Thinking and Learning in Online Tutorials

The emotional aspect of learning mainly refers to such issues as: self-motivation, getting involved in gaining knowledge, skilfully experiencing revealed values hidden in the proposed content of education, and – last but not least – the ability to focus attention and control over disruptions in learning. Each association of experiences with the learning content learned by students affects their permanent memorising and contributes to the independent formation of their own socio-moral attitudes. One should also remember about the importance of an ability to master the emotions that can come out in discussions or to deal with failures that may result from learning about difficult topics. When recognising the emotional aspect of learning, what seems important is to skilfully develop one's will by forcing oneself to overcome difficulties and by strengthening an attitude of perseverance.

The cognitive aspect includes the main cognitive skills of the student. It concerns the development of, among others, the passion of searching for the truth, development of the skills of asking questions, and improvement of the student's cognitive skills. This third issue mainly entails such cognitive skills as: curiosity, criticism, remembering, the ability to combine different contents, perceiving differences and similarities between the positions expressed, the ability to collect information, and the ability to build one's own knowledge system. In the cognitive range, the student is expected to master not only declarative knowledge – that is, knowledge about something – but also procedural knowledge – that is, knowledge of how to do something. It is worth remembering that the knowledge of the principles of rhetoric (such as conducting dialogues, thematic debate) and the ability to apply them in practice are important in this respect.

The strategic aspect includes the self-assessment of the acquired knowledge, as well as the skills and competences just mastered. This aspect concerns the students' attention to planning and monitoring their own "knowledge" system, as well as flexible and critical introduction of changes to this "system." This strategic aspect also helps students in gaining full independence of learning; this is where they are expected to master and, subsequently, to improve their ability to think critically, solve problems, and even discover them. They learn how to satisfy their curiosity

by improving the ability to formulate their own answers to questions, by solving their problems independently, but also by being able to build their own concepts or theories by searching for answers to questions such as "why?" or "what if?" In terms of the strategic aspect of critical learning, a student who has knowledge on how to construct spoken and written statements on the one hand, and on how to perform various activities such as being able to form definitions, reason, explain, prove, translate, justify, etc. on the other masters the ability to optimise problem-solving and connect theory with practice.

The social aspect of critical thinking and learning includes the argumentative skills of conducting discussions as well as maintaining openness and tolerance. In this aspect, the student acquires social competences, such as: ability to work in a team; empathy; cooperation; sharing ideas on social forums; and, finally, listening to and perceiving different sides of the issues discussed. In the course of social exchange of ideas, the students are expected to learn how to confront their own judgments and beliefs with the views and opinions of other people. This situation compels the students to be able to master the ability to use factual arguments, develop critical consideration of emerging doubts, and evaluate opinions.

On the Four Areas for Developing the Potential of Critical Thinking and Learning

The development of critical thinking and learning that takes into account the four aspects mentioned above should apply to both classroom and online tutorial. The four aspects of the development of critical thinking and learning let one distinguish four areas where the potential of critical thinking and student learning ought to be developed. These are: motivation, resourcefulness, social communication, and reflexivity (Table 2). Each of these areas is recognised to form a proper orientation of the students' natural abilities of critical thinking and learning where they can develop their emotions, as well as their will, intellect, action, and cooperation.

The four areas correspond to the main dispositions and abilities of the student, which, in turn, lead to mastering these competences that are necessary to deal with critical learning and gaining the knowledge.

Table 2.
The four areas for developing the potential of critical thinking and learning

Areas of development of critical thinking and learning potential			
Motivation in terms of attitude	Resourcefulness in terms of knowledge and abilities	Reflexivity in terms of individual skills and competences	Social communication in terms of social skills and competences
- self-control - control over disturbances - involvement - perceptiveness - perseverance - awareness of one's own abilities	a) in the order of learning the message: - efficiency - accuracy b) in the order of understanding the message: - criticism - inquisitiveness - creation of connections - imagination - reasoning	a) in the order of learning: - self-criticism - self-esteem - selection - transfer b) in the order of meta-learning: - planning - correction - evaluation	- interdependence - cooperation - dialogue - empathy and listening - openness - tolerance

S o u r c e: Own elaboration (Śleziński, 2015, p. 262).

Motivation is the first highlighted area necessary for the development the student's potential for critical thinking and learning. The student's motivation area focuses upon their self-control in the area of skilful coping with learning, as well as self-acceptance that mainly results from recognising one's own abilities and skills, and/or controlling internal and external disturbances, which should be skilfully recognised and overcome. In the area of motivation, it is also important to skilfully engage oneself in learning, as such an activity strengthens self-motivation and self-determination in acquiring knowledge. In turn, perceptiveness, recognising important issues, and perseverance in overcoming encountered difficulties result in the growth of one's satisfaction with self-learning.

Resourcefulness remains the second area of the development of the potential for critical thinking and learning. Learning in this dimension reaches its cognitive aspect not only in the order of acquiring the messages but also in the one that results in their understanding after their acquisition. Resourcefulness is the ability to learn and become aware of the essence of all the issues that have just been mastered. Thus, this approach to resourcefulness results in striving to have knowledge as well as a wide repertoire of strategies that can be used in different situations of uncertainty.

Resourcefulness in the order of acquiring messages comes down to the development of the procedures that should result in the elicitation of the forms of the oncoming problems as well as their prompt naming that should be effective, accurate, precise, attentive, and focused on the meaning. When attempting to understand information, resourcefulness results in criticism, inquisitiveness, searching for and perceiving the connections between various positions, as well as recognising new meanings and skilfully integrating them into the structure of known relationships and meanings. This ability contributes to the development of systemic thinking in building of one's own "system" of knowledge. In this way, students can be able to discover relationships between specific learning content and their own views, which should let them perceive reality from a different perspective.

An important instrument that helps one develop the learning potential is imagination, which allows one to look at the analysed issues in the out-of-the-box way. Most often, such imagination can be used to illustrate and/or visualise specific content by creating memory maps, diagrams, posters, or multimedia presentations.

The strategic aspect of developing the potential of critical thinking and learning rests in the notion of reflexivity, through which the students reach self-esteem of acquired knowledge, combine theory with action, and gain awareness of how learning proceeds and how it should be guided.

While remaining in the area of reflexivity, one should pay attention to the reflection on the accumulated knowledge that is always accompanying us. Such an approach seems necessary so as to make constant selection of the acquired knowledge due to the criteria important for us, as well as to look for new areas and contexts in which such knowledge can be used. The skills of transferring the acquired knowledge to other areas of science remain important. In turn, reflexivity in the order of meta-learning includes the self-assessment of the acquired skills and acquired competences, the ability to plan learning, to correct these plans and – last but not least – to evaluate possible ways of learning. In effective learning, it is important to know how to make use of the ability to learn from one's own learning experience. Students who can learn from their own mistakes, know how to change tactics and search for new ways of acquiring knowledge, recognise their own weaknesses and strengths of effective learning, and thereby express the understanding of the importance of self-criticism due to acquired competences and improved skills.

We are increasingly less likely to be independent at the workplace, which is why engaging in professional work requires us to skilfully cooperate with others. The employee is required to be able to listen and understand someone with whom he or she work, especially when he or she disagrees with someone right away. The students must therefore acquire numerous competences and improve social skills while preparing for the challenges awaiting them.

The ability to cooperate is necessary in any field where sharing knowledge and ideas appers to be a must. The ability to communicate and the willingness to share ideas create the conditions for both making effective decisions and coming out with effective actions. When working in groups, we must have the skill of empathy and tolerance, while not being ready to give up the ability of critical analysis of any of the discussed problems. The ability to listen attentively as well as to understand the arguments and/or accepted positions or opinions cannot deprive students of their right to present critical opinions. The desire to come to an agreement and to solve problems together is connected with the adoption of an attitude of openness, which is expressed by tolerance. It would be a mistake to think that being tolerant is concomitant with uncritical acceptance of other people's views or proposals for solving problems. When one is taking part in a dialogue, it is important to accept the others as equal partners and to see in them the dignity of the human person (Śleziński, 2014, pp. 151–161). At the same time, however, one should be critical of the propositions made by other people.

In blended learning, the potential of critical thinking and learning that has been developed should be presented and discussed with students. All practical tips that the teacher passes to the learners, including such tips as how to learn and/or how to effectively memorise learning content, are vauable when developing this potential. The teacher should encourage students to participate in various forms of loud learning, to share their knowledge; students ought to be encouraged to suggest interesting topics and/or to create their own tests, or even to prepare a "wall of questions," i.e. an activity in which students can propose their own questions that are to be answered accordingly. All such activities are supposed to help maintain the students' involvement in learning the curricular content of education, but also let both the teacher and the students enable a better understanding of the so-called weaknesses and strengths of their personalities and/or talents.

New information technologies introduced to schools enable learning at a distance, and teaching becomes a form of online tutoring. With this in mind, it is necessary to undertake large-scale research on this issue in order to properly define the principles of modern didactics. These are not only the expectations resulting from the current teaching system, but also the expectations of the interested parties themselves – students who use modern information technologies very well.

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Krzysztof Śleziński

Budowanie kompetencji do uczenia się oraz krytycznego myślenia poprzez zdalny tutoring

S t r e s z c z e n i e

Niniejszy artykuł jest przede wszystkim studium teoretycznym dotyczącym krytycznego myślenia. Rozwijanie tej kompetencji powinno się wspierać wykorzystując nowe technologie informacyjne. Tekst wskazuje na pewne możliwości wykorzystania technologii informacyjnych dla budowania kompetencji uczenia się i krytycznego myślenia. Rozwój nowych technologii dostarcza nam nowych narzędzi i form wsparcia procesu nauczania/uczenia się. Wiele z nowych narzędzi technologii cyfrowej stanowi nowe wyzwanie dla nauczyciela. Jednakże wyłania się pytanie, które nie tylko warto zadać, lecz na które także warto poszukiwać odpowiedzi: jak usprawnić proces nauczania/uczenia się wykorzystując nowe możliwości, jakie dają technologie, aby proces ten wzmocnić, a nie zakłócić jego przebiegu? Tutor czy nauczyciel powinien poszukiwać w tym obszarze możliwości edukacyjnych dla siebie i uczniów takich optymalnych rozwiązań, które sprawnie łączą zarówno elementy tradycyjnego nauczania, jak i nauczania na odległość. Takie rozwiązania daje efektywny tutoring, w przypadku którego nauczyciel jest dostępny dzięki sieci Internet dla każdego ze swoich studentów w określonym czasie, który jest dogodny zarówno dla nauczyciela, jak i dla ucznia.

S ł o w a k l u c z o w e: Guy Claxton, budowanie kompetencji uczenia się, tutoring online, krytyczne myślenie

Krzysztof Śleziński

Развитие способности к обучению и критического мышления в области онлайн-тьюторства

А н н о т а ц и я

Данная статья – прежде всего теоретическое исследование, охватывающее всю область критического мышления. Развитие критического мышления должно поддерживаться новыми информационными технологиями. Текст лишь указывает на некоторые возможности использования информационных технологий в концепции формирования силы и критического мышления. Развитие информационных технологий дает нам новые инструменты и формы для поддержки процессов преподавания / обучения. Многие из новых инструментов цифровых технологий ставят перед преподавателем новые задачи по обучению. Однако возникает вопрос, который не только стоит задавать, но на который стоит ответить: как улучшить процесс преподавания / обучения с помощью новых образовательных возможностей, чтобы укрепить его и не препятствовать одновременно? Тьютор-учитель должен искать и находить в области этих

образовательных возможностей, которые принадлежат ему и его ученикам, такие оптимальные решения, которые аккуратно сочетают как элементы традиционного обучения, так и те, которые характерны для дистанционного обучения. Это дает новые возможности для эффективного онлайн-обучения, когда учитель доступен онлайн для любого из учащихся в определенное время, что удобно для каждого.

К л ю ч е в ы е с л о в а: Гай Клэкстон, развитие способности к обучению, онлайн-тьюторство, критическое мышление

Krzysztof Śleziński

Desarrollar el poder de aprendizaje y el pensamiento crítico en el campo de la tutoría en línea

R e s u m e n

Este artículo es, ante todo, un estudio teórico que cubre toda el área del pensamiento crítico. El desarrollo de este pensamiento crítico debe estar respaldado por nuevas tecnologías de la información. El texto solo señala algunas posibilidades de utilizar las tecnologías de la información en el concepto de desarrollar el poder de aprendizaje y el pensamiento crítico.

El desarrollo de las tecnologías de la información nos brinda nuevas herramientas y formas para apoyar los procesos de enseñanza / aprendizaje. Muchas de las nuevas herramientas de la tecnología digital plantean nuevos desafíos de enseñanza para el maestro. Sin embargo, aparece una pregunta que no solo vale la pena hacer, sino que también vale la pena responder: ¿cómo mejorar el proceso de enseñanza / aprendizaje con la ayuda de las nuevas oportunidades educativas, para fortalecerlo y no molestarlo al mismo tiempo? Un tutor-profesor tiene que buscar y descubrir en el área de estas oportunidades educativas que le pertenecen a ella y a sus alumnos soluciones tan óptimas que combinan perfectamente los elementos de la enseñanza tradicional y los que son característicos del aprendizaje a distancia. Esto brinda nuevas oportunidades para una tutoría efectiva en línea cuando el maestro está disponible en línea para cualquiera de los estudiantes en un momento específico que sea perfectamente conveniente para cada uno de ellos.

P a l a b r a s c l a v e: Guy Claxton, Building Learning Power, tutoría en línea, pensamiento crítico

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Academic E-learning in Poland Results of a Diagnostic Survey

Abstract

Academic e-learning is not a new phenomenon world-wide or in Poland. However, there are only a few publications examining academic e-learning in Poland from a wider perspective (i.e., country-wide, and not only from that of the specific course, faculty member, or university orientation), and none of them present complex analysis and diagnosis. The goal of this paper is to present an investigation of academic e-learning in Poland in both public and private universities. The sample of 139 universities was surveyed, and relations between variables – such as e-learning process characteristics and university characteristics – were analysed via hypotheses testing. Results of the survey may constitute a basis for comparison on a national and international level and offer strategic directions for university authorities.

K e y w o r d s: academic e-learning, e-learning in Poland, diagnostic survey, dissemination of e-learning

Overview of Polish Academic E-learning

Polish academicians have been enriching didactics with various forms of Internet and modern information technologies (IT). Intensive development of e-learning in Poland, which has caused significant changes in didactics at most universities, is historic. One of the main drivers for e-learning development was financial support of European Union (EU) funds. Projects that were financed and supported covered implementations of e-learning platforms, development of multimedia educational materials, online courses and training, and conferences and workshops promoting e-learning. The second important factor was a change in the law in 2007, which mandated applications of distance learning methods and techniques. Consequently, increasing research interest in e-learning in Poland has led to much published work on a national level, but mainly in Polish.

E-learning is practised in many Polish universities, and its forms are varied. A research gap exists in the area. Specifically, it is the absence of complex research and its dissemination vis-à-vis e-learning on the national (Polish) level. The goal of this paper is to present results of an assessment of Polish academic e-learning (in both public and private facilities). For this purpose, literature was reviewed, forming the basis for an empirical research. Examination of basic characteristics and descriptive statistics, as well as statistical hypotheses testing was undertaken. The tested hypotheses related to relationships between e-learning unit (and process) characteristics and university characteristics.

Materials and Methods

State of the Art

Primary analysis was conducted using a query "e-learning in Poland" in the Web of Science database in December 2018. All citation indexes in the Web of Science were included. Other databases were not included. Sixty-nine papers were found; after abstract screening, however, only seven papers in English (six short conference papers and one journal paper) were included in the analysis. Secondary analysis was prepared by querying databases of Polish journals (*e-mentor, International Journal of Research in E-learning*), conferences (*eTEE*, *DLCC*, *VU*), websites of centres and associations (PTNEI, SEA), and monographs widely disseminated in the e-learning environment. Numerous papers were found that were related to teaching of specific subjects, modules, courses, and degrees (e.g. Helenowska-Peschke, 2017). Such work was omitted, as it was not relevant to the scope of this study. There is absence of empiricism that has been undertaken

using a complex approach to the dissemination of e-learning in Polish universities and the role of e-learning in didactics.

Those few publications (Table 1) address the following issues:

- quantitative fragmentary research, including satisfaction of stakeholders, efficiency and effectiveness of didactics, dissemination from university type perspective, and province perspective;
- qualitative research related to implementation cases studies and comparative analysis from faculty or university perspective, as well as practices of dedicated university-wide e-learning units.

Table 1.
Implementations of academic e-learning in Poland in the literature

Type	Scope	Publication
Quantitative	Satisfaction of students and/or employees	Chomczyński, 2015; Dąbrowski, 2005; Kierzek & Tyburski, 2005; Szadziewska & Kujawski, 2017; Szadziewska & Kujawski, 2016; Woźniak-Zapór et al., 2016
	Motivations	Rawa-Kochanowska, 2012; Wolski, 2011
	Efficiency of didactics	Betlej, 2011; Klimas, 2015; Kwiatkowska, 2007; Ordon & Sołtysiak, 2011
	Effectiveness of didactics	Bizon, 2010; Bizon, 2012; Kula & Plebańska, 2011
	Quality of education	Zalewska, 2015
	Platforms	Redlarski & Garnik, 2014
	University type-wide	Radkowska & Radkowski, 2005
	Province-wide	Eisenbardt, 2007
	Country-wide	Hołowiecki, 2014; Kraski, 2006; Kraski, 2007; Kraski, 2008; Kraski, 2009; Maleńczyk, 2015; Pleśniarska, 2016
Qualitative	Academic e-learning unit	Królikowski & Susłow, 2010; Kula & Plebańska, 2012; Pańka, 2012
	Faculty-wide	Grzeszczyk, 2010
	University-wide	Binda & Stofkova, 2017a; Binda & Stofkova, 2017b; Lenkiewicz et al., 2010; Paliwoda-Pekosz & Stal, 2015; Pokojski et al., 2011; Rutkowski et al., 2008
	Comparative (university-wide)	Gajewski & Jarosińska, 2011; Jaworska et al., 2018; Kisielnicki & Nowacka, 2013; Zając, 2005
	Country-wide	Turula, 2015

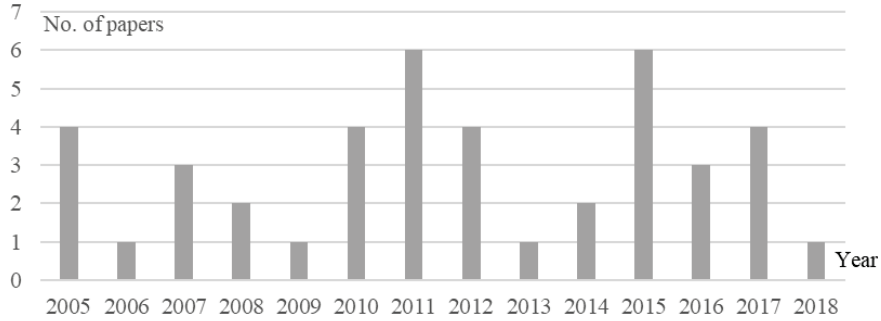


Figure 1. Analysed publications per year.

The momentums of Polish researchers' interest in the dissemination of their e-learning activities (not limited only to specific subjects, modules, courses, and degrees) were 2011 and 2015 (Figure 1). However, even then it was rather moderate, as maximum value was 6 papers in 2011. The historical yearly distribution of papers is probably a derivative of intensive implementations in that period and a number of EU-supported projects in Poland at that time. However, literature review per se (in any of its various forms, such as systematic literature review) is not the goal of this paper, nor the history and evolution of academic e-learning in Poland is. It may be the topic of separate and extended studies themselves. Therefore, the authors decided to limit the content of literature analysis section to pointing to the evidence of the existing research gap, which is the lack of holistic and up-to-date view of Polish academic e-learning. This gap determined goals discussed in the next section.

There was also the second gap identified, that is, the lack of up-to-date extended qualitative research on e-learning in Polish universities, including case studies, best practices, etc., to analyse contextual issues and phenomena of academic e-learning in Poland. For example, there was no follow-up of research on e-learning best practices conducted by Zając (2005). Turula (2014) provided qualitative discussion of Polish academic e-learning, its dominant prescriptive and control-based character and small differentiation of forms. However, her research does not reflect on quantitative data proving qualitative analysis. The second gap is not addressed in the presented paper.

The most complex research found was a diagnosis of e-learning in public higher education (Pleśniarska, 2016) and analysis of the use of e-learning in Poland (Maleńczyk, 2015) (the only one country-wide paper in English). Both efforts, though, were not focused on academic e-learning centralised units, which is the subject of this article. Hołowiecki (2014) analysed the use of academic e-learning in Poland. This work is also limited. It is only partially of quantitative nature and covers only public universities. It answers research questions related to the presence (or its lack), reasons and processes of implementation and financing (or its

lack), and basic features of e-learning platforms. Therefore, it does not provide the full picture of Polish academic e-learning. No existing work was found that presented a synthesis of country-wide research on academic e-learning. This issue has been addressed by Kraski (2006; 2007; 2008; 2009), but not comprehensively and it is outdated. All works discussed in this paragraph do not present statistical hypotheses testing for descriptions of characteristics and regularities in Polish academic e-learning.

With few English papers available, comparing specifics of academic e-learning in Poland with other countries is difficult. Additionally, it seemingly makes it impossible to place it in the wider context and disseminate results internationally. This paper contributes to the body of knowledge by approaching these twin weaknesses of existing relevant research.

Research Procedure

The general research goal was to diagnose the use of e-learning in Polish universities, both public and private ones. Detailed goals were as follows:

G1. Identification of academic units responsible for e-learning, with a specific focus on organisational, educational, and technological aspects.

G2. Identification of relationships between the use of e-learning and selected characteristics of universities (e.g., legal status, size).

G3. Identification of design of models of e-learning in universities.

G4. Identification of internal and external determinants of e-learning characteristics (strengths, weaknesses, potential, constraints) in the context of e-learning development.

G5. Identification of the needs of universities considering assessment of effectiveness of e-learning activities.

G6. Identification of key factors determining e-learning effectiveness from the perspective of stakeholders.

The research was multi-phase, using both quantitative and qualitative data, and focused on the following research questions:

Q1. What is the scale of dissemination of e-learning in Polish universities?

Q2. What organisational units are responsible for academic e-learning?

Q3. Are the size of university and number of students' user accounts correlated?

Q4. Are the size of university and number of exploited platforms correlated?

Q5. Are the size of university and existence of dedicated e-learning unit correlated?

Q6. Are the duration of the use of e-learning and the size of e-learning unit (number of employees) correlated?

Q7. Are the duration of the use of e-learning and the existence of dedicated e-learning unit correlated?

Q8. Are the existence of dedicated e-learning unit and the existence of full online studies correlated?

Q9. Are the existence of dedicated e-learning unit and the use of e-learning quality assurance procedures correlated?

Q10. Are the number of user accounts and the size of e-learning resources (modules/courses) correlated?

Q11. What are the procedures of e-learning activities assessment applied by universities?

Q12. Is the need for the structured assessment and monitoring of academic e-learning units articulated?

Q13. Which factors are critical in the assessment of academic e-learning units' effectiveness?

Q3–Q10 were transformed into hypotheses for statistical testing for the population of all Polish universities, public and private ones.

Pragmatism guided the research. Mixed, complex (multi-phase) methods were used. The approach was heterogeneous. The main research was divided into four phases (Table 2).

Table 2.
Research procedure

Phase		Scope, methods, tools, techniques
0	0.1	State-of-the-art of e-learning in Polish universities
		Analysis of existing data (secondary sources: Internet, reports, internal documentation), electronic media monitoring (press clipping), phone interview
	0.2	Verification and selection of academic e-learning units
	0.3	Selection of experts from academic e-learning units
1	1.1	Collection of data on the use of e-learning in universities
		Diagnostic survey; free-targeted interview; interview scenario with a list of desired data
	1.2	Detailing research area (boundaries and limitations of further research)
2	2.1	Gathering quantitative data on academic e-learning units
		Diagnostic survey; traditional or electronic survey; survey questionnaire
	2.2	Design of e-learning models
	2.3	Results analysis
	2.4	Statistical verification hypotheses
3	3.1	Individual in-depth interviews
	3.2	Results analysis and recommendations

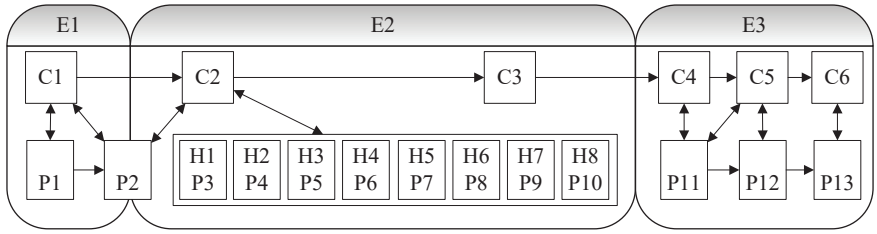


Figure 2. Research model.

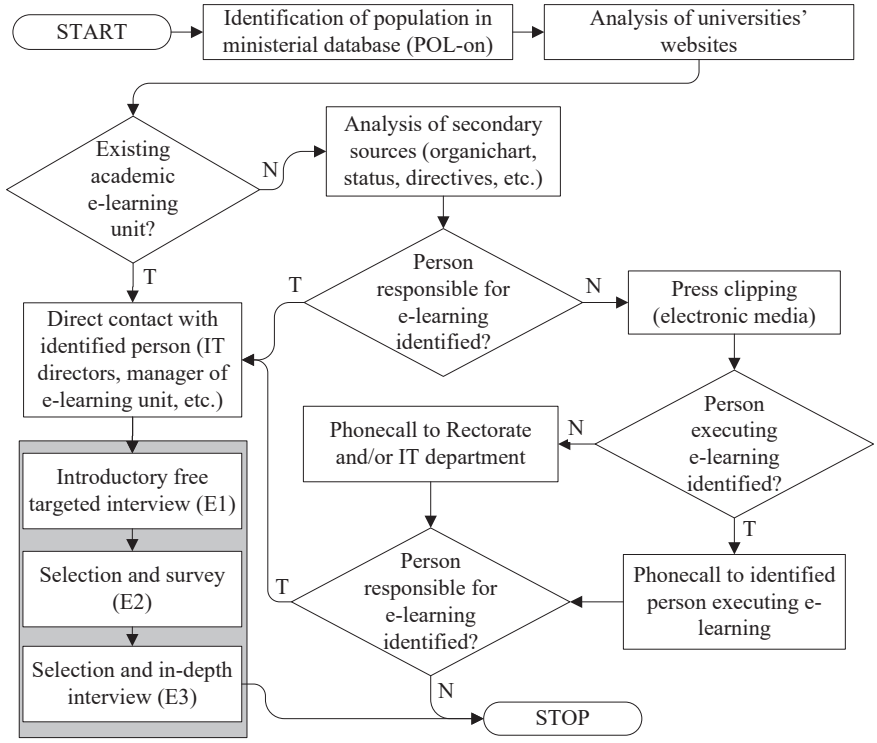


Figure 3. Research procedure.

Goals, questions, and hypotheses are presented on the research model (Figure 2). Pilot research was conducted to test research assumptions. Sampling was purposive. The entire population of Polish universities was approached based on data available from the government (Ministry of Science and Higher Education of the Republic of Poland, POLON database available at https://www.polon.nauka.gov.pl). The survey was (and also interviews, planned in further research, will be) directed to employees responsible for implementation or coordination of e-learning, decision makers, or influencers (directors/managers of units, specialists, pro-rectors and their deputies for e-learning). The research procedure is depicted on Figure 3.

The questionnaire was anonymous and included 27 questions subdivided into four groups: particulars, characteristics, didactics, technology. Survey results were crosschecked with results of introductory (free targeted) interviews and secondary sources (see phase 0.1 and 1.1 in Table 2, see Figure 3). When feasible, chi-square analyses were applied to test the hypotheses. Chi-square analyses were not used when there was an insufficient number of categories. The U Mann-Whitney test was utilised to test differences between medians. The Shapiro-Wilk test was employed to test normality of a distributions. Pearson's r's and Spearman's rank correlation coefficients were calculated. When the study was undertaken, there were 410 Polish universities, including 141 public and 269 private ones.

Subsequent sections focus on phases 0–2 (see Table 2).

Results

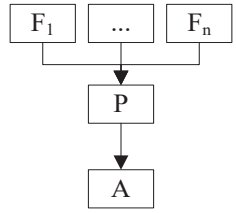
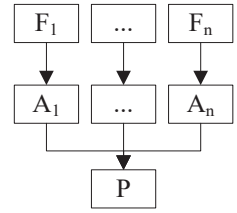
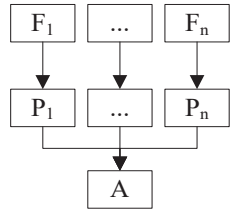
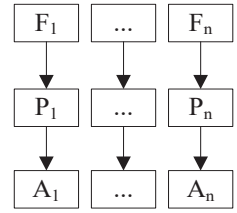
Introductory Free-targeted Interview

A conceptual constraint was the interpretation of e-learning terminology. Therefore, terminology was carefully explained to interviewees concerning what e-learning meant in the research, i.e., educational process (learning and teaching), in which the knowledge is delivered using modern IT and Internet, specifically, and communication/interaction between all the stakeholders is fully or partially supported by electronic channels (synchronously and/or asynchronously). Another assumption for units selected for the investigation was that the unit is in the development or maturity stage of a lifecycle. Units implementing, testing, piloting, or terminating e-learning did not illustrate sufficient experience with e-learning, as those phases are changing too dynamically. Interviews showed high diversity of the form in which e-learning is practised in Polish universities (Table 3). A total of 256 introductory free-targeted interviews were conducted (Figure 3).

Another study problem was identification of relevant e-learning authorities. As such, this necessitated contacting multiple individuals within a university to obtain formal approval for research. Some individuals rejected participation in the study, owing to revelation of confidential data. Some private universities employed IT staff on a contractor basis, so contact with them was difficult (mainly via e-mail). Therefore, those universities without permanent IT staff were excluded from the study.

Another difficulty was an effect of the dynamics of private universities (i.e., liquidations, ownership changes, consolidations, and transformation of different types [e.g. new name]). This dynamism typically led to a change of strategy with regard to e-learning.

Table 3.
Academic e-learning models in Poland concerning administration and IT

	Administration centralised	Administration decentralised
Platform centralised	Fully centralised	Informatically centralised
		
Platform decentralised	Administratively centralised	Fully decentralised
		

N o t e : A – administration; F – faculty; P – platform.

Grounding on interviews, fraction of universities declaring the use of e-learning and fraction of universities conforming research sample purpose were estimated, accordingly with indicators of the structure of a population. Public universities were grouped according to their teaching profile, as in ministerial registers (Table 4); private universities were categorised by province (Table 5).

Slightly more than 75% of all public universities used e-learning. All economic, pedagogical, nature, medical, maritime, military, state services, and physical education universities used e-learning. One university of technology and one general (academy) university revealed a lack of e-learning. E-learning was markedly less popular in professional (state higher professional schools) (ca. 70% used it) and church and theology universities (above 50%). Use of e-learning in art universities, however, was relatively unpopular (below 25%).

Slightly more than 50% of private universities used e-learning. There were significant differences between provinces. All universities located in Warmia-Masuria, with over 70% located in Lubelskie, Pomerania, and Greater Poland used e-learning. None located in Lubuskie used it.

Table 4.
E-learning in Polish public universities

Profile*	N	U_w	W_w	U_d	W_d	W_d'	U_b	W_z	Remarks**	
									a)	b)
Art	19	4	0.21	2	0.50	0.11	0	0.00	5P,1H	2L
Economy	5	5	1.00	5	1.00	1.00	5	1.00	-	-
Medicine	10	10	1.00	6	0.60	0.60	2	0.33	-	3R,1K
Naval	2	2	1.00	1	0.50	0.50	0	0.00	-	1R
Pedagogy	5	5	1.00	4	0.80	0.80	3	0.75	-	1R
Nature	6	6	1.00	2	0.33	0.33	2	1.00	-	4R
State services	2	2	1.00	2	1.00	1.00	1	0.50	-	-
Technology	18	17	0.94	15	0.88	0.83	14	0.93	-	2R
General (academies)	18	17	0.94	15	0.88	0.83	11	0.73	1H	1R,1S
Military	5	5	1.00	3	0.60	0.60	1	0.33	-	2R
Physical education	6	6	1.00	4	0.67	0.67	3	0.75	-	1R,1T
Professional	36	25	0.69	16	0.64	0.44	14	0.88	4H	3R,2T,4W
Others***	9	5	0.56	3	0.60	0.33	3	1.00	-	2R
SUM	141	109	0.77	78	0.72	0.55	59	0.76	-	-

N o t e : * – profiles were taken from POLON database, ** – a) declared lack of the use of e-learning; b) declared the use of e-learning, but not conformed with assumptions; *** – declared the use of e-learning, but not conformed with assumptions.

L e g e n d :

$$N=U_{w\ }+U_{n(P,H,D)} \quad (1)$$

$$U_{d\ }=U_{w\ }-(L,\ K,\ R,W,T,S) \quad (2)$$

$$W_w=U_w/N \quad (3)$$

$$W_d=U_d/U_w \quad (4)$$

$$W_d\prime=U_d/N \quad (5)$$

$$W_z=U_b/U_d \quad (6)$$

H – declared former use of e-learning and lack of current use
K – e-learning only for trainings (e.g. librarian, safety & health, etc.)
L – e-learning only in foreign languages education
N – overall number of universities
P – planning/initiating phase of e-learning
R – fully decentralised e-learning
T – test/pilot phase of e-learning
S – closure phase of e-learning
U_n – declared lack of the use of e-learning
U_b – number of researched universities that conformed to research assumptions
U_d – number of universities conformed with research assumptions
U_w – declared the use of e-learning
W – implementation phase of e-learning
W_d – indicator of the use of e-learning in universities conformed to research assumptions
W_d' – indicator of conformance with research assumption by universities that declared the use of e-learning
W_w – indicator of the use of e-learning in universities
W_z – return indicator (ratio of researched universities in those which conformed to research assumption)

Table 5.
E-learning in Polish private universities

Profile*	N	U_w	W_w	U_d	W_d	W_d'	U_b	W_z	Remarks**	
									a)	b)
Lower Silesia	21	13	0.62	11	0.85	0.52	5	0.45	1P,1H	1W,1T
Kuyavia-Pomerania	15	10	0.67	10	1.00	0.67	6	0.60	1P,1H	-
Lubelskie	9	7	0.78	7	1.00	0.78	5	0.71	1P	-
Lubuskie	4	0	0.00	0	n/a	0.00	0	n/a	-	-
Lodzkie	19	10	0.53	8	0.80	0.42	3	0.38	1D	1W,1T
Lesser Poland	14	9	0.64	7	0.78	0.50	6	0.86	2P,1H	1T
Mazovia	73	34	0.47	28	0.82	0.38	22	0.79	4P,6H,4D	2S,1T,3W
Opolskie	2	1	0.50	1	1.00	0.50	1	1.00	1P	-
Podkarpackie	9	3	0.33	3	1.00	0.33	2	0.67	2H	1W
Podlasie	12	6	0.50	6	1.00	0.50	3	0.50	1H,1D	-
Pomerania	18	13	0.72	9	0.69	0.50	7	0.78	1H	1R,2W,1T
Silesia	28	14	0.50	10	0.71	0.36	4	0.40	1H	1R,2W,1T
Swietokrzyskie	9	2	0.22	2	1.00	0.22	2	1.00	2P	-
Warmia-Masuria	4	4	1.00	3	0.75	0.75	2	0.67	-	1K
Greater Poland	22	17	0.77	15	0.88	0.68	8	0.53	1P,1H	1S,1W
West Pomerania	10	4	0.40	4	1.00	0.40	4	1.00	2H,1D	-
SUM	269	147	0.55	124	0.84	0.46	80	0.65	-	-

N o t e : * – a) declared lack of the use of e-learning; b) declared the use of e-learning, but not conformed with assumptions.

L e g e n d: see Table 4.

A majority of Polish universities (62.4%) declared that they implemented e-learning, but only 49% (of all universities) confirmed the assumptions for purposive sampling. There was a fraction of universities that closed (5.6%) or were in the closure phase of (1%) e-learning activities, mainly owing to usage of all external funds (EU projects), lack of teacher motivation, and insufficient skill and competence of academic staff (mainly full professors). One percent applied e-learning platforms only for particular courses (including language teaching). Twenty four universities (5.9%) were in the implementation, testing, or pilot phase, and eighteen (4.3%) were in the planning phase. Approximately five percent utilised a fully decentralised e-learning model (see Table 3), but only two of those were private and eighteen were public. Centralisation of e-learning was mainly driven by gaining experience and advancement in e-learning activities.

Survey

Descriptive statistics. General descriptive statistics are presented in this section. The dataset is available upon request of the authors.

Most respondents were actively practising and managing e-learning with much professional experience (directors of e-learning units, platform administrators, specialists for e-learning) (Table 6). The survey was completed (and positively crosschecked with introductory free-targeted interviews and secondary sources, e.g. internal regulations) by 139 universities, 80 private and 59 public ones.

Table 6.
Structure of respondents

Position	Private universities	Public universities
Director/manager of e-learning unit	26.3%	27.1%
Platform administrator	23.8%	28.8%
Specialists for e-learning	22.5%	16.9%
IT specialists	12.5%	8.5%
Other	7.5%	6.8%
Methodologist of e-learning	3.8%	3.4%

Public universities significantly more often (49.2%) had a centre for e-learning in their structure than private universities did (26.3%). Chi-square tests revealed a statistically significant correlation between type of university and type of e-learning academic unit in the university (Table 7). There was no significant correlation found between period of the use of e-learning and type of university ($p > 0.05$, Table 8). Position of e-learning unit in the university structure was significantly correlated with the type of university ($p < 0.05$, Table 9).

Table 7.
Structure of academic e-learning units

Type of academic unit responsible for e-learning	Private	Public
Centre for e-learning	26.3%	49.2%
IT department	38.8%	27.1%
Lack	27.5%	16.9%
Other	7.5%	6.8%
$\chi^2 = 7.98$ $p = 0.046$		

Table 8.
E-learning maturity in years

E-learning maturity in years		Private	Public
15 and more		8.8%	8.5%
10 – 14		21.3%	23.7%
6 – 9		23.8%	33.9%
3 – 5		27.5%	23.7%
2 and less		18.8%	10.2%
$\chi^2 = 3.18$	$p = 0.53$		

Table 9.
E-learning position in organisational structure

Superior position		Private*	Public
Rector's deputy		13.8%	49.2%
Rector		31.3%	18.6%
Chancellor		25.0%	23.7%
Other		21.3%	8.5%
Dean		8.8%	0.0%
$\chi^2 = 25.56$	$p = 0.00$		

N o t e : * The sum is not equal to 100% due to rounding.

Public universities significantly more often placed e-learning units under the rector's deputy supervision (49.2%). Average employment in academic e-learning units was higher in public (4.42 FTE) than in private (2.95 FTE) universities. A Mann-Whitney U test ($p < 0.05$) showed that the number of employees was dependent on the type of university (Table 10). No significant relationship between existence of advisory body for e-learning and the type of university was found, nor was the existence of methodologists of e-learning and the type of university (Table 11). E-learning activities were chiefly financed from central university budgets (both in public and private universities), and EU funds were no longer significant source of cashflow (Table 12).

Table 10.
E-learning unit employment

		Private	Public
Average number of employees of e-learning unit		2.95	4.42
$Z = 2.36$	$p = 0.02$		

Table 11.
Existence of advisory boards and methodologists of e-learning

Experts supporting e-learning unit			Private	Public
Advisory board	$\chi^2 = 25.56$	p = 0.02	38.8%	45.8%
Methodologist	$\chi^2 = 25.56$	p = 0.02	38.8%	33.9%

Table 12.
Main sources of finance for e-learning

Source of financing	Private	Public
Central university budget	78.8%	74.6%
Other	7.5%	15.3%
Self-financing	13.8%	5.1%
EU funds	0.0%	3.4%
Not applicable	0.0%	1.7%

There was a statistically significant relationship between the type of e-learning activity executed in the university and the type of university (i.e., online studies were more frequently in private universities [37.5%], but other activities [e-learning courses and trainings] were not dependent on the type of university). There was a statistically significant relationship between the level of studies and the type of university. Public universities more frequently (44.1%) applied e-learning on the tertiary level (PhD) of higher education. For the bachelor level, a chi-square test could not be applied because of a nonsufficient sample. For masters and postgraduate education, there were no statistically significant relationships. The number of full-time students supported by e-learning showed a statistically significant relationship to the type of university. The part-time students, however, showed no statistically significant relationship. No statistically significant relationship was found between the form of classes and the type of university. A statistically significant relationship between the target groups of e-learning training and the type of university was found: public universities more frequently (69.5%) applied e-learning for instructional courses for their staff (Table 14, Table 13).

There was no statistically significant relationship between the existence of standards for e-books development and the type of university (39.0% of public and 53.8% of private applied standards). There was a statistically significant relationship between the existence of e-learning evaluation procedures and the type of university. Public universities used evaluation procedures more frequently than private universities did (45.8% versus 21.3%) (Table 14).

Table 13.
Types of e-learning activities, levels and types of e-learning studies, forms of e-learning classes, target groups of e-learning trainings

E-learning activity	Private	Public	Statistical significance
Specific e-courses (subjects, modules, etc.)	91.3%	94.9%	χ^2=0.68; df=1; p=0.41
Specific e-trainings	78.8%	89.8%	χ^2=3.03; df=1; p=0.08
Online studies curricula	37.5%	11.9%	χ^2=11.42; df=1; p=0.00
Bachelor	100.0%	94.9%	χ^2 not applicable
Master	81.3%	81.4%	χ^2=0.00; df=1; p=0.99
Tertiary (PhD)	6.3%	44.1%	χ^2=28.03; df=1; p=0.00
Postgraduate / MBA	66.3%	52.5%	χ^2=2.69; df=1; p=0.10
Full-time	72.5%	94.9%	χ^2=11.57; df=1; p=0.00
Part-time	98.8%	93.2%	χ^2 not applicable
Lectures	91.3%	96.6%	χ^2 not applicable
Exercises	91.3%	91.5%	χ^2=0.00; df=1; p=0.95
Lectureships (language)	52.5%	61.0%	χ^2=1.00; df=1; p=0.32
Seminars	42.5%	52.5%	χ^2=1.38; df=1; p=0.24
Projects	31.3%	45.8%	χ^2=3.05; df=1; p=0.08
Laboratories	33.8%	37.3%	χ^2=0.19; df=1; p=0.67
Instruction students training	60.0%	74.6%	χ^2=3.22; df=1; p=0.07
Instruction staff trainings	41.3%	69.5%	χ^2=10.88; df=1; p=0.00
Additional students' training	45.0%	45.8%	χ^2=0.01; df=1; p=0.93
Open for individuals	20.0%	15.3%	χ^2=0.52; df=1; p=0.47
Tailored for organisation	18.8%	15.3%	χ^2=0.30; df=1; p=0.59
Others	6.3%	5.1%	χ^2 not applicable

Table 14.
Quality assurance of e-learning didactics

Position	Private	Public	Statistical significance
Standards for e-books development in place	53.8%	39.0%	χ^2=2.97; df=1; p=0.08
Evaluation procedures in place	21.3%	45.8%	χ^2=9.43; df=1; p=0.00

Interestingly, the fraction of universities that applied standards and procedures seemed to be relatively low, yet one conceivably would expect that such procedures should be in place in any university. Private universities more frequently (67.5% versus 16.9%) shared audiovisual files, while public universities more frequently (76.3% versus 3.8%) shared ePUB files. Webinars were more frequently used in private universities (27.5% versus 13.6%), but synchronous communication tools showed no statistically significant relationship to the type of university.

Synchronous communication tools were used relatively rarely, and text chat was the most popular among them – but even it was not applied widely (71.3% of private and 55.9% of public). A chi-square test manifested a relationship (χ^2=4.23, p=0.04) between integration of e-learning platform with information systems and the type of university. However, the number of universities that integrated e-learning platform with other information systems was relatively low (40.0% of private and 57.6% of public) (Table 15).

Table 15.
Shared files, synchronous communication tools

File type	Private	Public	Statistical significance
PDF	97.5%	93.2%	χ^2 not applicable
MS Office/ ODF	85.0%	86.4%	χ^2=0.06; df=1; p=0.81
HTML/XHTML	68.8%	71.2%	χ^2=0.10; df=1; p=0.76
Audiovisual	67.5%	16.9%	χ^2=34.93; df=1; p=0.00
ePUB	3.8%	76.3%	χ^2=79.00 df=1; p=0.00
LaTeX	3.8%	5.1%	χ^2=0.15; df=1; p=0.70
Text chat	71,3%	55.9%	χ^2=3.49; df=1; p=0.06
Videoconference	33.8%	23.7%	χ^2=1.64; df=1; p=0.20
None	21.3%	32.2%	χ^2=2.12; df=1; p=0.15
VoIP	25.0%	27.1%	χ^2=0.08; df=1; p=0.78
Webinars	27.5%	13.6%	χ^2=3.90; df=1; p=0.048
Multimedia table	13.8%	15.3%	χ^2=0.06; df=1; p=0.80
Virtual class	11.3%	13.6%	χ^2=0.17; df=1; p=0.68

N o t e : Multiple choice was possible.

A Mann-Whitney U test revealed a statistically significant relationship between the type of university and the following variables:

- average number of resources available on an e-learning platform (Z=2.08, p=0.04), which was significantly higher in public universities (570 versus 406);
- average number of student accounts on e-learning platform (Z=4.94, p=0.00), which was higher in public universities (7847 versus 1841);
- average number of teacher accounts on e-learning platform (Z=3.38, p=0.00), which was higher in public universities (281 versus 88).
  That was expected as public universities are generally bigger.

Statistical verification of hypotheses. Eight hypotheses were formulated (H1–H8).

H1. The size of the university (number of students) and number of active student accounts on e-learning platform are correlated.

H2. The size of the university and the number of used e-learning platforms are correlated.

H3. The size of the university and the existence of e-learning dedicated unit are correlated.

H4. The time of e-learning implementation and the number of employees responsible for e-learning are correlated.

H5. The time of e-learning implementation and the existence of e-learning dedicated unit are correlated.

H6. The existence of an e-learning dedicated unit and the delivery of full online studies are correlated.

H7. The existence of an e-learning dedicated unit and application of quality assurance procedures for e-learning are correlated.

H8. The number of student and teacher accounts and the number of resources (subjects/courses) on e-learning platform are correlated.

Each hypothesis was formulated in three variants, i.e. for all researched Polish universities (x.1), for all researched private Polish universities (x.2), for all researched public Polish universities (x.3). Results of the hypothesis tests are presented in Table 16.

University sizes were categorised as follows:

(1) public universities:
- small: fewer than 10000 students, 31 universities;
- medium: from 10000 to 20000 students, 15 universities;
- large: from 20001 to 30000, 8 universities;
- very large: over 30000 students, 5 universities;

(2) private universities:
- small: fewer than 2000 students, 57 universities;
- medium: from 2000 to 5000 students, 15 universities;
- large: from 5001 to 9000 students, 5 universities;
- very large: over 9000 students, 3 universities.

Table 16.
Statistical verification of hypotheses

Hypothesis		Pearson's r / Spearman's rs / χ^2	Correlation	Significant difference	Significance level p
H1	1.1	r=0.73	Strong		<0.05
	1.2	0.89	Very strong		<0.05
	1.3	0.63	Strong		<0.05
H2	2.1	rs=0.21	Weak		<0.05
	2.2	0.11	Very weak		>0.05
	2.3	0.30	Weak		<0.05
H3	3.1	rs=0.23	Weak		<0.05
	3.2	0.17	Very weak		>0.05
	3.3	0.27	Weak		<0.05
H4	4.1	rs=0.43	Moderate		<0.05
	4.2	0.46	Moderate		<0.05
	4.3	0.36	Weak		<0.05
H5	5.1	rs=0.19	Very weak		<0.05
	5.2	0.17	Very weak		>0.05
	5.3	0.19	Very weak		>0.05
H6	6.1	χ2=0.05; df=1		No	>0.05
	6.2	0.02; 1		No	>0.05
	6.3	0.04; 1		No	>0.05
H7	7.1	E-book standards χ^2=8.43; df=1		Yes	<0.05
		Evaluation procedures 0.14; 1		No	>0.05
	7.2	E-book standards 5.87; 1		Yes	<0.05
		Evaluation procedures 0.04; 1		No	>0.05
	7.3	E-book standards 4.25; 1		Yes	<0.05
		Evaluation procedures 0.98; 1		No	>0.05
H8	8.1	Students accounts r=0.34	Weak		<0.05
		Teachers accounts 0.42	Moderate		<0.05
	8.2	Students accounts 0.53	Moderate		<0.05
		Teachers accounts 0.70	Strong		<0.05
	8.3	Students accounts 0.33	Weak		<0.05

N o t e : Correlation strength was assumed as by Evans (1996), i.e., coefficient equal 0 then no correlation, (0.00;0.20) – very weak, <0.20;0.39) – weak, <0.40;0.59) – moderate, <0.60;0.79) – strong, <0.80;1.00) – very strong, 1 – perfect.

n=139 (all), n=80 (private), n=59 (public).

Discussion and Conclusions

There were several constraints while conducting the study interviews and survey. These were mainly related to organisational issues and difficulties with reaching trustable data. Therefore, survey results were verified and cross-checked with the results obtained from secondary sources and introductory free-targeted interviews.

The majority of universities used e-learning, but slightly less than 50% conformed to assumptions of purposive sampling: definition and scope of e-learning (in order to extract universities using e-learning only for training, but not for regular teaching), and the phase of the e-learning life cycle in the university (in order to eliminate units in implementation, testing, pilot, and closure phases).

Polish academic e-learning units were rather small (fewer than five employees [FTE] in public and fewer than three in private universities, on average). Also, advancement of e-learning tools varied significantly. On average, however, a relatively small group utilised a structured methodological support (advisory boards and/or methodologists) and quality assurance (e-books standards and/or evaluation procedures). This seems to be an area for potential improvement.

The size of the university and the number of active students' user accounts on e-learning platform were positively correlated for public, private, and total group of universities. The size of the university and the number utilising e-learning platforms were positively correlated for public and total group of universities, but for private universities it was not possible to confirm that relationship.

The size of the university and the existence of an e-learning dedicated unit were correlated for public and total group of universities, but for private universities it was not possible to confirm that relationship. E-learning maturity (measured in years of usage) and the number of employees (FTE) responsible for e-learning were positively correlated for public, private, and total group of universities. E-learning maturity and the existence of an e-learning dedicated unit showed a statistically significant relationship for the total group of universities, but no such conclusion could be made for public and private universities separately. The existence of an e-learning dedicated unit and conducting of full online studies were not statistically significantly related for public, private, or the total group of universities. Many universities (107) had an e-learning dedicated unit, but only less than 30% were conducting full online studies. It is due to the fact that sub-groups of private and public were not numerous enough to prove dependency.

The existence of quality assurance for e-learning was analysed in two dimensions: (1) use of standards for e-books development, (2) use of evaluation procedures for e-learning didactics. The relationship between the first dimension and the existence of an e-learning dedicated unit was statistically significant for the public, private, and total group of universities. However, for the second

dimension, this finding was not obtained. A positive correlation between the number of resources on an e-learning platform and the number of active teacher accounts was found for the public, private, and total group of universities. The same result was observed for the number of active students' user accounts, and the sum of teachers' and students' user accounts.

This study may offer practitioners, researchers, and educators a framework for undertaking similar research not only in higher education, but also in primary, junior high, and high schools. Therefore, comparative analysis on a national and regional level would be possible, thus permitting examination of differences and similarities concerning characteristics of economies, societies, demographics, and educational systems. The study results constitute a basis for further qualitative research: individual in-depth diagnostic interviews to find context, opinions, approaches, needs, dimensions, and tools employed for assessment of e-learning units' effectiveness, and design and verification of an integrated method of assessment of e-learning academic units, which possibly will be the subject of publishing in the future.

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Izabela Maleńczyk, Bartłomiej Gładysz

E-learning akademicki w Polsce – wyniki sondażu diagnostycznego

Streszczenie

E-learning akademicki nie jest zjawiskiem nowym na świecie, ani w Polsce. Jednakże publikacje podejmujące tematykę e-learningu w Polsce z szerszej perspektywy (tj. kraju, a nie jedynie przedmiotów, wydziałów czy uniwersytetów) są nieliczne. Żadna z tych publikacji nie prezentuje kompleksowej analizy i diagnozy. Celem niniejszego artykułu jest prezentacja diagnozy e-learningu akademickiego w Polsce zarówno dla publicznych, jak i prywatnych uczelni. Diagnozę przeprowadzono dla próby 139 uczelni. Przeprowadzono statystyczną weryfikację hipotez dla zależności pomiędzy zmiennymi opisującymi proces e-learningu a zmiennymi opisującymi uczelnię. Wyniki diagnozy mogą stanowić podstawę porównań zarówno na poziomie krajowym, jak i międzynarodowym, a także bazę dla wytyczania kierunków strategicznych przez władze uczelni.

Słowa kluczowe: e-learning akademicki, e-learning w Polsce, sondaż diagnostyczny, upowszechnienie e-learningu

Izabela Maleńczyk, Bartłomiej Gładysz

Академическое электронное обучение в Польше: результаты диагностического исследования

Аннотация

Академическое электронное обучение не является новым явлением ни в мире, ни в Польше. Тем не менее, существует всего несколько публикаций, в которых рассматривается академическое электронное обучение в Польше с более широкой точки зрения (то есть, по всей стране, а не только в контексте конкретного курса, преподавателя или ориентации в университете), и ни в одной из них не представлен комплексный анализ и диагностика. Цель данной статьи – представить исследование академического электронного обучения в Польше как в государственных, так и в частных университетах. Выборка из 139 университетов была исследована, и отношения между переменными, такими как характеристики процесса электронного обучения и характеристики университета, были проанализированы с помощью проверки гипотез. Результаты опроса могут послужить основой для сравнения на национальном и международном уровнях и предложить стратегические направления для руководства университета.

Ключевые слова: академическое электронное обучение, электронное обучение в Польше, диагностическое обследование, распространение электронного обучения

Izabela Maleńczyk, Bartłomiej Gładysz

E-learning académico en Polonia: resultados de una encuesta de diagnóstico

R e s u m e n

El e-learning académico no es un fenómeno nuevo ni en todo el mundo ni en Polonia. Sin embargo, solo hay unas pocas publicaciones que examinan el aprendizaje electrónico académico en Polonia desde una perspectiva más amplia (es decir, en todo el país y no solo desde el curso específico, el miembro del profesorado o la orientación universitaria) y ninguna de ellas presenta análisis y diagnósticos complejos. El objetivo de este trabajo es presentar una investigación del e-learning académico en Polonia en universidades públicas y privadas. Se encuestó a la muestra de 139 universidades y se analizaron las relaciones entre variables, como las características del proceso de aprendizaje electrónico y las características de la universidad, a través de pruebas de hipótesis. Los resultados de la encuesta pueden constituir una base para la comparación a nivel nacional e internacional y ofrecer direcciones estratégicas para las autoridades universitarias.

P a l a b r a s c l a v e: e-learning académico, e-learning en Polonia, encuesta de diagnóstico, difusión del e-learning

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Some Advanced Experience of the Development of Teachers' Digital Competence

Abstract

The article deals with digital competence, which is one of the main components of the professional competence of future teachers, as well as discloses the foreign experience of the development of future teachers' digital competence. European standards for the determination of digital competence are analysed – in particular, the digital competence profile of the teacher *Digital Competency of Educators* (*DigCompEdu*), which includes six areas of teachers' digital competences. The article outlines approaches to the description of educational outcomes concerning the digital competence of teachers. The analysis of the experience of foreign countries (Lithuania, Estonia, Austria, Norway, the Netherlands, Western Australia, Slovenia on the problem of developing the digital competence of teachers in the process of their professional training in higher education institutions and professional development of practising teachers) has been carried out taking into account the scope of digital competence. The reforms in the education of foreign countries concerning the digitalisation of education and the development of teachers' digital competence are considered. Academic courses, foreign educational platforms, communities for teachers' professional training and professional development on digital technologies are described and analysed. The analysis of the work of foreign researchers allows to make conclusions about the approaches to classification and description of the types of teachers' digital competence.

K e y w o r d s: digital competence, information and communication technologies, digital competence profile, training courses, on-line platforms

Introduction

Problem of Research

Informatisation of education, the development of digital technologies in the world actualises the need for informational training of future teachers, which involves the development of their digital competence. Digital competence allows a person to be successful in modern information space, to manage information, to make decisions quickly, to develop important competences. According to foreign researchers, today the content of school, higher education, and adult education requires considerable attention. If, when developing programmes for adults, one needs to take into account the context of the application of digital tools in the life of a society, which is mainly related to the field of services, then school education is an invariant component which will allow a school-leaver to be successful in any profession in the future. The potential of information and communication technologies (ICT) and digital tools develops and expands, and thus teachers are required to possess additional knowledge and skills.

The content of digital education is under the watchful eye in all the developed countries. The notions of "digital didactics," "digital literacy," and "digital education" are widely discussed in the professional environment (Kroksmark, 2015). The issues of the development and application of educational technologies in school in a digital learning environment are of particular interest. Therefore, the problem of teacher training is given a special attention.

Teaching profession, especially nowadays, requires continuous learning and improvement, as society changes and new technologies requiring new competences appear. In a digital environment, it is the teacher who determines the pace of learning and the order of acquiring knowledge, and who is responsible for student progress. One of the areas of research that is actively developing in the field of studying the professional activity of a teacher is the discovery, description, formation, and development of professional competencies that reflect the content of a teacher's work in digital learning environment.

The purpose of the article is to analyse foreign standards for determining teachers' digital competence, and to describe foreign experience and modern approaches to the problem of developing the digital competence of teachers in the process of their training in higher education institutions and improving the qualifications of teachers in the field of ICT use as well as the creation of digital educational content.

Methodology of Research

In the process of research, we have used a set of theoretical and practical methods. The theoretical methods are analysis, generalisation, comparison, and systematisation of foreign experience in the formation and development of teachers'

digital competence. Empirical methods are content analysis of programmes and on-line courses on the development of teachers' digital competence.

Prerequisites for Research

Many Ukrainian and foreign researchers consider the problem of the development of teachers' professional and digital competences as well as the effective use of ICT in education in their research. Thus, R. Gurevych, A. Gurzhii, M. Zhaldak, N. Morse, and O. Spirin examine the essence and structure of the digital competence and digital culture of future teachers (Zhaldak, Ramsjkyj, & Rafaljsjka, 2009). R. Gurevych, N. Morse, and O. Spivakovskyi research the problems of developing future ICT teachers' professional competences. M. Spodarets and S. Gushchyna emphasise the importance of training teachers under the conditions of the informatisation of education (Morze, 2010).

However, the research of foreign experience in the development of teachers' digital competence needs a separate study.

Results of Research

The problem of the development of teachers' digital competence and the formation of their digital literacy is highlighted in international documents, educational standards, and publications of scientists from many countries. There is no unified term for determining the professional competence of a teacher in the field of ICT. Foreign scientists use the following terms: digital competence, digital literacy, competence in the field of ICT use, information and communication literacy.

In 2006, the European Parliament and the Council of the European Union stated that the digital competence was a key component of human learning throughout life.

In 2017, the European Union developed a profile of teachers' digital competences, *Digital Competence of Educators* (*DigCompEdu*), which includes six areas of teachers' digital competences (Põldoja, 2016):

- the use of digital technology in professional pedagogical environment;
- the development of the professional skills of searching, creating, and sharing digital education resources;
- the development of necessary skills for using digital tools in learning and teaching;
- the availability of digital instruments for the assessment of learning outcomes;
- using digital tools for expanding students' educational opportunities.

Foreign researchers G. Ottestad and M. Kelentric introduced and justified three areas of the competence of a modern teacher: universal digital competence, digital competence in didactics, and professional competence (Ottestad, Kelentric, & Gudmundsdottir, 2014).

The system of the development of teachers' digital competence has been introduced in Norway, Estonia, Lithuania, Austria, and Slovenia. Its analysis and main approaches are described further.

Norway

Norwegian Ministry of Education and Research developed "Programme for Digital Competence 2004–2008." According to the curriculum of Norwegian secondary education, the use of digital tools is included in the five main competences which should be developed while teaching pupils.

In Norway, the educational reform of knowledge advancement came into force in 2012. The working group developed a frame for five key competences according to which digital competence includes the following skills: receiving and processing digital data, creating and processing digital data, digital communication, digital solutions. These skills are developed in the course of learning Norwegian and a foreign language, mathematics, physics, chemistry, biology, history, and geography.

As a result of implementing the programme in 2010, the Norwegian Centre for ICT in Education was created. Its main task is observation of the development of students' and teachers' digital competence in educational institutions, and the development and implementation of the strategies of using ICT into different levels of education and future teachers training programmes.

Norwegian researcher R. Krumsvik proposed a model of teachers' digital competences, which includes (Krumsvik, 2008):

- basic ICT skills, which include basic skills in working with information and communication technologies;
- didactic ICT competencies, which include the teacher's ability to choose and use ICT within the discipline of teaching in terms of didactic expediency;
- training strategies, that is, understanding how one can best use ICT in the educational process;
- digital competences, which indicate the teacher's attitude towards the use of ICT in an educational context and adherence to ethical rules.

The assessment of the digital competence of teachers is important in Norway. The Norwegian Centre for ICT in Education developed online tools for monitoring the use of digital technology by administrative staff and teachers, the results of which are taken into account during their professional development.

Lithuania

Considerable changes in the development of digital society are taking place in Lithuania, which since 2009 has been holding a leading position in the world in: data transmission over the Internet, the development of the network of fiber-optic Internet (FTTH), the penetration of mobile telephone communications, the active position of the youth in using ICT. The development of the digital competence of the citizens of Lithuania and the digitalisation of education began with the adoption of "Lithuanian Information Society Development Programme for the period of 2014–2020." This programme aims at developing a successful informational society, creating opportunities for the development of Lithuanian digital literacy, digital content, and ICT infrastructure. The main objectives of the programme are the following: developing the skills of using ICT, reducing the digital divide in Lithuania; creating open and secure access to electronic resources for citizens; ensuring the development, reliability, and functional compatibility of the infrastructure of information and communication technologies (McKnight, O'Malley, & Ruzich, 2016).

The process of developing the digital competence of Lithuanian teachers takes place according to the ECDL framework and on the basis of teacher professional development centres, including the Centre for School Improvement and the Centre for Modern Didactics.

On the initiative of the Ministry of Education and Science of Lithuania and the Centre for Information Technologies in Education, an educational portal "Open Information and Consultation System" was created, which offers courses for improving teachers' digital competence.

These courses provide for the formation of beginner, intermediate, and advanced levels of digital competence and include digital tasks for teachers: developing and planning lesson notes, training projects with the use of cloud services, including the service Learning Designer.

Estonia

Considerable attention is being paid to the formation of teachers' digital competences in Estonia. Estonia's Ministry of Education and Science in cooperation with the Estonian Information Technology Foundation, the Tiger Leap Foundation, and the Estonian Educational Research Network created the Fund of Information Technologies Education. Its purposes are to provide e-learning and training on ICT usage by school leaders in management and the development of digital competence of teachers, which will improve the quality of education in Estonia and increase its competitiveness in the world (Ottestad, Kelentric, & Gudmundsdottir, 2014).

At the initiative of this fund, important programmes for the education system were adopted. One of them is the programme of reforming education in relation to the development of digital competence of citizens "Education Strategy for 2012–2020."

An important aspect in implementing this programme is solving the ways of developing teachers' digital competence, the creation of their electronic educational environment and digital tools, filling the educational material with digital content in order to disseminate progressive pedagogical practices.

For teachers in Estonia, professional development is compulsory in the sphere of ICT. It is carried out every 3 years at the universities chosen by the Ministry of Science and Research. For this purpose, courses "European Computer Driving Licence," ECDL, and "International Computer Driving Licence" (ICDL) have been created. They include 40 academic hours and witness a certain level of teachers' digital competence.

Certification tests cover the material from the following modules: the basics of information technologies; work with computers and file management; text editor; spreadsheets; creating presentations; application of databases; data transmission with the help of information technologies. The ICDL certificate provides for the successful completion of one test on the basic theoretical knowledge in the field of information technologies and six practical applications on the use of applications. This testing is recognised in the information society of Europe. The result of the successful passing of the test for obtaining the ICDL certificate is, in fact, the certificate itself and the certificate of the European sample which lists the tests passed by the teacher.

The development of teachers' digital competence in Estonia is also carried out while participating in various national projects. Among them, the Estonian Foundation for European Union Education, European Schoolnet, and the research programmes Archimedes and Open Estonia Foundation should be pointed out.

Digital learning ecosystems occupy an important place in the educational process in Estonia. The concept of digital ecosystems appeared in the mid-2000s. In one of the last publications on digital ecosystems, Chang and West (2006) identified common criteria for natural and digital ecosystems, namely: interaction and engagement; balance; self-organisation. Ecosystem thinking has inspired the definition and interpretation of various types of digital systems: the ecosystem of e-learning (Chang & Guetl, 2007; Uden et al., 2007), the digital learning ecosystem (Ficheman & de Deus Lopes, 2008; Laanpere, Pata, Normak, & Põldoja, 2012), and the ecosystem of digital teaching and learning (Reyna, 2011).

Scientists Chang and Guetl (2007) suggest that the concept of an educational ecosystem can be used to describe physical or virtual environments and to narrow them down to a particular sphere, for example, e-learning. In this context, they use the concept of e-learning ecosystems (ELES). This allows identifying and studying specific characteristics of ELES, such as community education and other stakeholders, digital learning tools, and conditions peculiar to e-learning.

Laanpere, Põldoja, and Normak state that digital learning ecosystem (DLE) includes e-learning ecosystems, but special attention is given to communication technologies. In their interpretation, DLE is the third learning system. The

autonomous educational systems, software (application software), and the virtual learning environment (LMS, computer assessment tools) are previous generations of educational systems (Laanpere, Põldoja, & Normak, 2013). They describe the software architecture, the pedagogical foundations, the approach to content management, and the availability of all the three generations of educational systems.

On the basis of these studies, M. Laanper and G. Poldoy have developed a digital system for teachers' digital competence development (Laanpere & Põldoja, 2013). It includes a combination of cloud services and information technologies, and consists of software and various Internet platforms that provide content creation for the visualisation of training. The following tools are included:

- advanced templates PILOT – software and Internet platforms with the help of which one can create and store videos, slides, and pictures to visualise the educational topics. For 4 years, teachers have created 32 educational PILOT resources. The method of progressive inquiry is particularly suitable for subject areas that involve students in an in-depth study;
- the LeMill web community for searching and sharing open educational online resources that covers four sections for the implementation of learning in the cloud. LeMill's design includes common platforms and services of Wikipedia and social networks. The goal is to find a community of teachers who can work together on the creation and improvement of educational resources. The LeMill software is divided into four sections: content, methods, tools, and communities;
- LeContract (an educational contract) is an interactive tool with the help of which students carry out educational projects and which enables them to stay connected with teachers and other students. LeContract has been developed to encourage the usage of the project method while studying in open online courses in blogs. Students have the opportunity to develop educational projects to determine their personal learning goals, the resources they plan to use, the strategy for achieving their goals, and the expected outcomes of their learning;
- EduFeedr (using blogs in teaching and kearning) is an online tool for managing open-course learning where students and teachers create and manage their blogs, diaries of educational projects. EduFeedr supports two most widely used blog services – WordPress26 and Blogger27;
- The DigiMina system is a web-based tool for the assessment and self-assessment of the digital competence of teachers.

With the use of PILOT and LeMill, the problem of the improvement of the search, exchange, and creation of open educational resources in the context of school education is being solved. LeContract and EduFeedr have been developed in the context of teacher training in Estonia and are aimed at creating open online courses.

The participation of Estonian teachers in international projects also significantly influences the development of their digital competence. In 2014, the online 4 EDU

project which involved Estonia, Lithuania, Latvia, and Germany started under the Erasmus+ programme. The main emphasis in this project is on: creating online tools for teachers to work together; the development of their digital competence; the improvement of pedagogical practice with the use of information technologies. The implementation of the Online 4 EDU project involves the creation of professional training courses for teachers with a mixed form of training, continuous improvement of the abilities to use informational technologies in their work.

Participants of this project, researchers N. Warbers, K. Schubers, and J. Lambertts, based on the results of the testing of teachers within the framework of the Online 4 EDU project, developed the curriculum and programmes for the development of teachers' ICT competence in accordance with the level of knowledge and their skills in the sphere of ICT usage (Warbers, Schubers, & Lambertts, 2015). Two training groups were formed: teachers who do not use online tools in their work and are beginners in the field of using ICT, and teachers who have the experience of using online tools in their work and are willing to improve their knowledge and skills in using ICT. The teachers were offered a graduation course which consists of three modules: "Technical aspects," "Methodological aspects," and "Practice." During the course, the teachers were offered to use various tools for different activities (Figure 1).

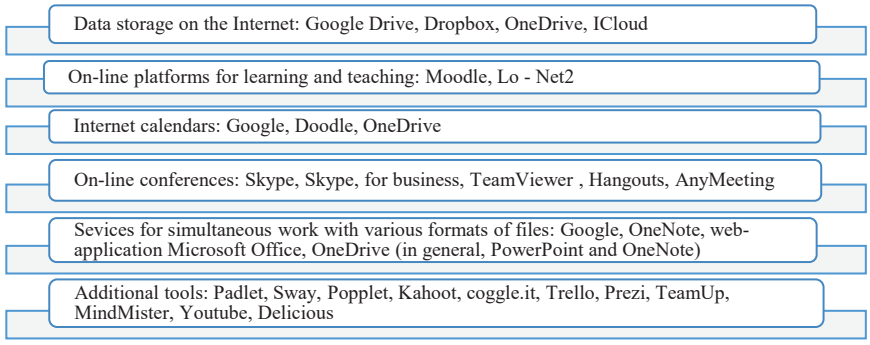

Figure 1. The Online4EDU course tools.

While teaching a course, the analysis and correction of content modules and topics was carried out in accordance with the problem situations which arose among teachers while using ICT in their professional activity.

The Netherlands

Active informatisation of education in the Netherlands began in 2001. At first, study in the sphere of using information technologies in education was carried out by the research agency Kantar TNS. Later, this problem was studied by the Kennisnet Foundation. The Kennisnet Foundation proposed the model "Balance of Four," which was a step towards the implementation of information

and communication technologies in education. In this model, informational technologies are used to organise the educational process and the professional work of teachers. Their effective implementation can be carried out in case of balanced and consistent interaction of the four components: pedagogical approach; professional knowledge, which is a component of information and communication competence and includes IC skills, the ability to use them for solving various tasks; educational digital materials, which include all digital educational content; infrastructure of information and communication technologies, which provides computer access support, the quality of the Internet network, their support, and maintenance. By introducing this model, each educational institution can choose pedagogical methods and determine the purpose, tasks, and ways of their implementation. The role and communication of all the participants of the educational process are important in the implementation of the model since they have to balance all the four components.

In 2009, on request of the Advisory Board of the heads of the pedagogical faculties of the Netherlands, "Knowledge Base on ICT" was created, which defined the structure and content of the digital competences of future and practising teachers. In 2013, it was improved and it received the new title "National ICT Competency Framework for Teachers." According to the ICT Competency Framework, ICT competency of a teacher includes:

- personal attitude,
- main digital skills,
- digital media and information literacy,
- pedagogical behaviour.

In addition to the advisory board of heads of pedagogical faculties, the Kennisnet Foundation in the Netherlands, taking into consideration the results of monitoring and research, proposed in 2013 an updated version of the framework of IC-competence of a teacher, which included three areas of the professional development of teachers (Table 1).

The results of reforming educational policy carried out by the government of the Netherlands are outlined in the document Dutch Platform Education 2032.

Since 2015, the Netherlands have analysed and improved curricula for secondary education, which, according to government, should be future-oriented. In this respect, it is important to create conditions for the training and further work of future citizens in the digital society, to prepare future teachers for the formation of students' digital competence, and to develop the digital competence of future teachers.

As a result, training platforms for teachers have been created in the Netherlands: "People as Educational Architects," "People Create Schools," "Surfspace: Collaboration on ICT Innovations in Education and Research" (Redeker & Poonie, 2017).

Table 1.
Framework of the ICT-competence of a teacher (developed with the support of the Kennisnet Foundation)

Areas of professional development	Competences
Professional activities	A teacher: - skilfully organises his/her activity and demonstrates its results by using ICT; - uses ICT tools to organise his/her activity, communicate with pupils and colleagues via e-mail, social networks; - is able to substantiate expediency of the selected ICT tools and ways of their usage; - is able to trace, detect, and resolve administrative matters with the help of the Internet or local computer networks; - monitors and visualises the results of students' achievements.
Professional development	A teacher: - develops his/her skills using ICT tools; - searches and selects digital resources and the latest inventions in the professional field in accordance with educational content; - exchanges knowledge and experience with his/her colleagues through blogs, virtual platforms, and social networks.
Pedagogical approach	A teacher: - relies on the acquired knowledge in the field of ICT; - is able to assess the possible effective use of ICT, combine knowledge and skills with educational content, pedagogical technologies, teaching methods using ICT tools; - is able to analyse the effectiveness of the use of ICT and to substantiate their use in the professional activity.

For the professional development of teachers in the field of ICT use in the Netherlands, the online platform Leraar 24 was created, which includes files and videos from various educational subjects developed by researchers and teachers. With the help of this platform, teachers can also share their experience and teaching methods, and discuss difficulties in the usage of information and communication technologies.

With the help of the platform "People as Educational Architects," graduate students can create virtual school and imagine themselves as teachers or representatives of the administrative staff. It is important that in this virtual environment teachers can monitor and give advice on the improvement of a student as a teacher, create problem situations, and help the students solve them.

The educational platform "Surfspace: Collaboration on ICT Innovations in Education and Research" is a platform for experiments in the field of ICT that enables future teachers to learn at their own pace and whenever it is convenient for them.

In 2017, the Kennisnet Foundation issued the recommendations "Technology Compass for Education," where it is suggested to use Strategic Technology Maps

for the introduction of digital technologies into the educational process. According to the foundation experts, they will promote the development of the educational environment through the use of digital technologies, the choice and application of the necessary digital technologies for accomplishing educational objectives.

Austria

Austrian teachers are offered a wide range of opportunities for constant professional development, including the development of digital competence. In the new Austrian law on pedagogical education adopted in 2017, media education and the development of student digital skills are components of a teacher's professional competence.

In 2013, Federal Ministry of Education, Science, and Research introduced the digitalisation strategy programme "School 4.0," which encompassed school and higher education.

During the development of this programme, a lot of studies were conducted to determine: the technical condition of educational institutions, the level of the introduction of digital technologies into the educational process, and the level of digital competence of teachers of various disciplines. Based on the research data, a community of Austrian pedagogical higher education institutions developed a strategy for preparing future teachers for the use of digital technologies and e-learning. It was called "White Paper on the Development of the Potential of Teachers for the Transition to Using Digital Media and Technologies." This strategy is a strategy of the development of Austrian education which identifies ways to prepare teachers to work in a digital school environment.

The goal of the strategy of digitising the learning process is not only to create and develop the digital skills of all Austrian students and the critical skills to work with digital content, but also to develop all the components of the digital competence of students and teachers: media literacy, critical processing of information and data, network security, knowledge of technologies, and problem solving.

The assessment of the digital skills of Austrian school teachers showed a low level of competence in the development and distribution of their own content with the use of digital technologies and their safe online work. As a result of this study, new curricula for preparing bachelor's degree and master's degree teachers at Austrian educational institutions were developed.

During the first year of study at colleges and universities, testing future teachers to determine the formation of their basic digital skills is compulsory. The level of the skills is determined according to the criteria of the Austrian Information Framework – the programme "Digital Competences for Students." Students with the low level of basic digital skills are obliged to undergo the basic training course "E-Learning-Strategiegruppe der Pädagogischen Hochschulen Österreichs: Weißbuch zum Kompetenzaufbau von Pädagoginnen und Pädagogen für den Umgang mit digitalen Medien und Technologien."

Future teachers must undergo the course "Digital Educational and Administrative Environments," the aim of which is to develop their digital competence.

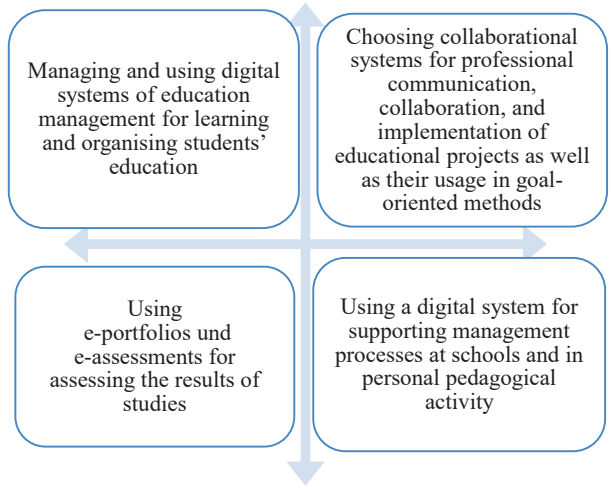

Figure 2. Digital competence in "Digital Educational and Administrative Environment" course.

In addition, during the training, future teachers in Austria are given the opportunity to conduct research using digital technologies, in particular:

- search, selection, and evaluation of information;
- writing scientific articles;
- data analysis for scientific purposes using digital tools.

Slovenia

Systematic implementation of information and communication technologies in education in Slovenia began in 1994. The aim of the project "Computer Literacy" was to provide Slovenian education with computer software (systemic and didactic) and prepare teachers for the use of ICT in education, development, and research projects. Training teachers, students, and headmasters as well as providing Slovenian universities with ICT and other types of activities have been attracting large investments since 1994.

One of the major breakthroughs in the digitalisation of Slovenia's education was the implementation of the project "E-learning" (2009–2013) in public institutions at the expense of the European Social and Regional Fund for the development and implementation of e-learning, the development of the digital competence of a teacher and a headmaster. The project "E-education" included two components: "E-competent teacher" and "Electronic support." According to the results of the first component, thousands of teachers (about 8,000 per year) attended various seminars on e-learning, 50% of which participated online in international

conferences SIRIKT, collected and created digital learning materials, shared their experience on the use of ICT in education and management with colleagues. A model of an e-competent teacher, which contained 6 competences, was proposed.

As a result of the "Electronic Support" component, each school received a consultant who assessed the resources of the school and its information and communication environment. This evaluation made it possible to create a plan of informational and technical support of the establishment and to give recommendations on managing the school and professional support of teachers on the use of information technologies in the educational process.

A powerful educational reform of Slovenia's digital society began with the adoption of the strategy "Digital Slovenia 2020," which outlines the development of the informational society and the digital competence of the next generation until 2020, and highlights the strategic documents on cybersecurity. One of the key components of the strategy "Digital Slovenia 2020" is a scientific and innovation strategy of Slovenia which outlines guidelines for the creation of an innovative society based on the knowledge combined in the Strategy of Smart Specialisation (SSS) in which the scope of the information society and IT is emphasised.

One of the key areas for achieving the goals is education. With this in mind, in 2016, the Ministry of Education, Science, and Sport of Slovenia adopted the document "Strategic Guidelines for the Further Implementation of ICT in Slovenian Educational Institutions until 2020."

The starting point for educational policy is to create favourable conditions for the functioning of an open educational environment oriented towards innovative pedagogical strategies and the opportunities of using ICT in the learning process.

In this document, a lot of attention is paid to the role and importance of ICT in modern society, to the role and importance of ICT in education and training of specialists, to the overview of the current state of education informatisation in Slovenia, and to outlines of the most important tasks the accomplishment of which contributes to the digitisation of education:

- the development of educational content using information and communication technologies;
- the creation of electronic educational resources: dictionaries, textbooks, teaching materials, manuals;
- the development and use of modern educational platforms for training;
- the formation and development of the digital competence of students, readers, heads of educational institutions;
- providing educational institutions with modern equipment and software, digitisation of educational materials;
- the use of automated education management systems;
- the introduction of e-learning into secondary and higher education.

Since the 8th grade, the subject "Engineering and Technology" is compulsory in secondary school. The subjects "Computer," "Technology," and "Robotics" are

offered for a deep study. For effective organisation of the educational process and creation of educational content for learning these subjects, teachers need proper knowledge and skills in the field of ICT.

In view of this, adult education and teacher training are also important issues in Slovenia. Each year, the Ministry of Education, Science, and Sport of Slovenia selects the best curricula, which are included into "Priority Professional Teacher Training Programmes." Over the past years, applications have been gathered to develop ICT skills and competences (Figure 3).

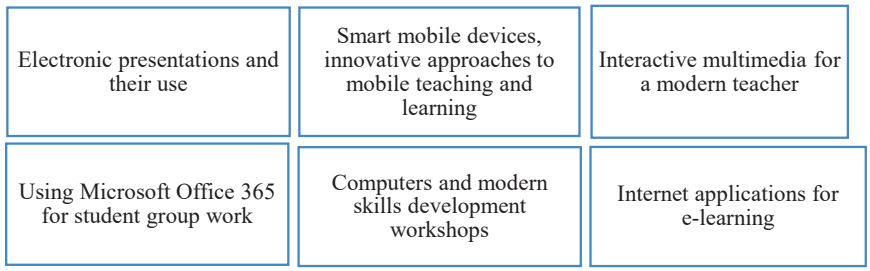

Figure 3. Applications for the development of ICT skills and competences.

National Institute of Education in Slovenia is implementing the project MENTEP – system support of digital teaching experience and practice. It was developed in accordance with the European School Network and 30 ministries in Europe. The project implements the strategy of European policy in the field of ICT in education, in particular the improvement of teachers' professional skills and their ability to create innovations in the use of ICT and their digital literacy. The participation in the project promotes the use of ICT in learning and teaching, but also helps to establish connections between European and national policies and tools used to achieve the set goals, improving the professional development of teachers to be able to use ICT.

The main areas of the project implementation in Slovenia are cooperation in developing web tools for the assessment and self-assessment of pedagogical digital competencies, national coordination of interstate experiment, and ecosystem development to support the professional development of teachers.

System Support of digital pedagogical experience MENTEP was implemented in Slovenia from 2015 to 2018. An online tool for the assessment and self-assessment of pedagogical digital competences (POT-OS, TET-SAT) and an ecosystem (portal) for supporting the professional development of teachers in this field were developed.

The innovative international project on educational policy experiments ATS 2020 is also worth mentioning. It is funded jointly with the European Commission (Erasmus +) which consists of 17 partners from 11 EU countries. It is a comprehensive learning model that facilitates the formation of the necessary communication

skills among students within the framework of the curriculum, including the development of modern approaches to teacher training and the use of innovative tools for the development and assessment of teachers' professional competences, such as digital competence.

Western Australia

The Department of Education in Western Australia conducted a survey of teachers regarding their professional level in the field of ICT, the results of which identified three levels of the use of information technologies in education: basic, intermediate, and advanced. Professor Graham Davis clearly describes the skills that a teacher needs to possess for each of these levels. The main factors influencing the level of digital competence of a teacher are gender, experience, age, ICT available at an educational institution, internal motivation, and professional self-development of a teacher. The list of skills allows a teacher to determine his/her level in ICT use. Davis, under the support of the European Commission, has developed and is constantly updating the ICT4LT website, which is a set of educational modules for teachers on information and communication technologies. The ICT4LT site has a gradation of levels with the skills described, test assignments for determining the level of ICT skills, as well as additional teaching materials for teachers.

Conclusion

An overview of the revealed foreign practices in the field of the development of teachers' digital competence proves that a modern teacher should have a fairly high level of skills in the use of information and communication technologies. The description and structuring of the digital competences of a teacher proves the expansion of the content of his/her professional activity, changes in the requirements for training, and conditions of a teacher's professional development.

The article deals with the profile of digital competences of a teacher *Digital Competence of Educators* (*DigCompEdu*), which includes six areas of digital competences of a teacher.

The analysis of the experience of developing digital competence of teachers has revealed the fact that in some countries much attention is paid to the distance development of teachers' digital competence, the creation of websites and portals for self-education, and the search for the necessary ICT to be used in teachers' professional activity. However, scientists from other countries state that the development of the digital competence of a teacher involves the creation of an educational environment in which innovation is encouraged and ICT is integrated

into education. In many countries, much attention is being paid to the improvement of the skills of teachers in developing their digital competence. To accomplish this, many training programmes and courses have been developed.

The prospect of further research lies in the study of the experience of foreign countries on the assessment of the digital competence of teachers, the development of assessment tools, and the strategic model of the development of teachers' digital competence.

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Halyna Henseruk

Zaawansowane doświadczenie w rozwijaniu kompetencji cyfrowych nauczycieli

Streszczenie

W artykule rozważa się jeden z głównych elementów kompetencji zawodowych przyszłych nauczycieli – ujawnia się kompetencje cyfrowe i zagraniczne doświadczenie w rozwijaniu kompetencji cyfrowych przyszłych nauczycieli. Analizowane są europejskie standardy określania kompetencji

cyfrowych, w tym Digital Competence of Educators (DigCompEdu), profil kompetencji cyfrowych obejmujący sześć obszarów kompetencji cyfrowych nauczyciela. W artykule przedstawiono podejścia do opisu wyników edukacyjnych dotyczących kompetencji cyfrowych nauczycieli. Przeprowadzono analizę doświadczeń nauczycieli zagranicznych (Litwa, Estonia, Austria, Norwegia, Holandia, Australia Zachodnia, Słowenia) w zakresie rozwoju kompetencji cyfrowych nauczycieli w procesie ich szkolenia zawodowego w instytucjach szkolnictwa wyższego oraz poprawy kwalifikacji zawodowych praktykujących nauczycieli w zakresie kompetencji cyfrowych. Przeanalizowano reformy edukacji obcych krajów w zakresie cyfryzacji edukacji i rozwoju kompetencji cyfrowych nauczycieli. Opisano i przedstawiono charakterystykę kursów szkoleniowych, zagranicznych platform edukacyjnych, społeczności na potrzeby szkoleń i zaawansowanych szkoleń nauczycieli technologii cyfrowych. Analiza pracy zagranicznych naukowców sugeruje podejście do klasyfikacji i opisu rodzajów kompetencji cyfrowych nauczyciela.

S ł o w a k l u c z o w e: kompetencje cyfrowe, technologie informacyjne i komunikacyjne, profil kompetencji cyfrowych, szkolenia, platformy internetowe

Halyna Henseruk

Передовой опыт развития цифровой компетентности учителей

А н н о т а ц и я

В статье рассмотрено одну из основных составляющих профессиональной компетентности будущих учителей – цифровую компетентность и раскрыто зарубежный опыт развития цифровой компетентности будущих учителей. Проанализированы европейские стандарты определения цифровой компетентности, в частности профиль цифровых компетенций учителя Digital Competence of Educators (DigCompEdu), который включает шесть областей цифровых компетенций учителя. В статье выделены подходы к описанию учебных результатов по цифровой компетентности учителей. Проведен анализ опыта зарубежных стран (Литва, Эстония, Австрия, Норвегия, Нидерланды, Западная Австралия, Словения) по проблеме развития цифровой компетентности учителей в процессе их професйнои подготовки в учреждениях высшего образования и повышения квалификации практикующих учителей учитывая рамки цифровой компетентности. Проанализированы реформы образования зарубежных стран по цифровизации образования и развития цифровой компетентности учителей. Рассмотрены и дана характеристика учебных курсов, зарубежных образовательных платформ, сообществ для подготовки и повышения квалификации учителей с цифровых технологий. Анализ работ зарубежных исследователей позволяет сделать вывод о подходах к классификации и описания видов цифровых компетенций учителя.

К л ю ч е в ы е с л о в а: цифровая компетентность, информационно-коммуникационные технологии, профиль цифровой компетентности, учебные курсы, онлайн платформы

Halyna Henseruk

Experiencia avanzada en el desarrollo de la competencia digital de los docentes

R e s u m e n

El artículo trata sobre la competencia digital, que es uno de los componentes principales de la competencia profesional de los futuros docentes, y revela la experiencia extranjera del desarrollo de la competencia digital de los futuros docentes. Los estándares europeos para la determinación de la competencia digital se analizan, en particular, el perfil de competencia digital del profesor Competencia digital de educadores (DigCompEdu), que incluye seis áreas de las competencias digitales de un profesor. El artículo describe los enfoques para la descripción de los resultados educativos relacionados con la competencia digital de los docentes. El análisis de la experiencia de países extranjeros (Lituania, Estonia, Austria, Noruega, Países Bajos, Australia Occidental, Eslovenia sobre el problema del desarrollo de la competencia digital de los docentes en el proceso de su formación profesional en instituciones de educación superior y el desarrollo profesional de la práctica profesores) se ha llevado a cabo teniendo en cuenta el alcance de la competencia digital. Se consideran las reformas en la educación de los países extranjeros con respecto a la digitalización de la educación y el desarrollo de la competencia digital de los docentes. Se describen y analizan cursos académicos, plataformas educativas extranjeras, comunidades para la formación profesional de docentes y desarrollo profesional en tecnologías digitales. El análisis del trabajo de los investigadores extranjeros permite sacar conclusiones sobre los enfoques de clasificación y descripción de los tipos de competencia digital de los docentes.

P a l a b r a s c l a v e: competencia digital, tecnologías de información y comunicación, perfil de competencia digital, cursos de capacitación, plataformas en línea

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