

ON THE QUESTION OF WHY COPYRIGHT CANNOT BE SYNONYMOUS WITH INTELLECTUAL PROPERTY WITHIN DIGITAL COMPETENCE FRAMEWORKS

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ABSTRACT

The article is aimed at studying expert opinions in establishing the types of intellectual property and the corresponding legal relations that arise in the digital space and require attention in the educational context. As a result of a survey of 21 experienced law professors, we found that the presentation of intellectual property in digital competence frameworks cannot be limited by copyright although this aspect is important. In addition to describing different intellectual property objects, the content of digital competence frameworks could reflect issues such as modern legislative improvements, methods for identifying rightsholders, ways to conveniently distribute works and rights, the value of various intellectual property objects, forms of software protection and issues of protecting works created by artificial intelligence in existing legal regimes, methods for detecting violations of intellectual property rights, and mechanisms for compensation for the loss from violations of intellectual property rights which correspond to the current level of development of relations in the digital space.

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Keywords: Digital Competence; Intellectual Property; Copyright; Survey.

ACERCA DE LA CUESTIÓN DE POR QUÉ EL DERECHO DE AUTOR
NO PUEDE SER SINÓNIMO DE PROPIEDAD INTELECTUAL DENTRO
DE LOS MARCOS DE COMPETENCIA DIGITAL

RESUMEN

El artículo tiene como objetivo estudiar las opiniones de los expertos en el establecimiento de los tipos de propiedad intelectual y las relaciones jurídicas correspondientes que surgen en el espacio digital y requieren atención en el contexto educativo. Como resultado de una encuesta a 21 experimentados profesores de derecho, concluimos que la presentación de la propiedad intelectual en los marcos de competencia digital no puede estar limitada por los derechos de autor, aunque este aspecto es importante. Además de describir diferentes objetos de propiedad intelectual, el contenido de los marcos de competencia digital podría reflejar cuestiones tales como modernas mejoras legislativas, métodos para identificar a los titulares de derechos, formas de distribuir convenientemente obras y derechos, el valor de varios objetos de propiedad intelectual, formas de protección de *software* y cuestiones de protección de obras creadas por inteligencia artificial en los regímenes legales vigentes, métodos para detectar violaciones a los derechos de propiedad intelectual y mecanismos de compensación por la pérdida por violaciones a los derechos de propiedad intelectual que correspondan al nivel actual de desarrollo de las relaciones en el espacio digital.

Palabras clave: competencia digital; propiedad intelectual; derechos de autor; encuesta.

INTRODUCTION AND RESEARCH CONTEXT

At a time when ICT has already penetrated various types of human activity, the development of digital competence is an integral function of education. The European Commission¹ emphasizes a need for high-quality education content and developing a European Digital Education Content Framework as one of the actions to support a high-performing digital education ecosystem. Generally, digital competence frameworks are the main tool for providing support “on harnessing the potential of digital technologies to innovate education and training practices,

¹ European Commission. Digital Education Action Plan 2021-2027. Resetting education and training for the digital age, 2020. Retrieved from https://ec.europa.eu/education/sites/default/files/document-library-docs/deap-communication-sept2020_en.pdf

improve access to lifelong learning and to deal with the rise of new (digital) skills and competences needed for employment, personal development and social inclusion”².

With the significant growth of innovations in the Digital Era, the scale of intellectual property rights for new works, products, systems, etc. is also growing. Requirements for content of the digital competence are also increasing. This competence integrates a large number of knowledge areas for mastering safe, legal, critical and creative of technologies³, therefore, alongside digital specialists, the development of the content of digital competence implies the involvement of policy, legal and subject matter experts⁴. Legal knowledge is an integral part of supporting the development of digital technologies and neglect of it slows down the corresponding digital economic growth.

While most of the attention is paid to didactics, legal aspects of the digital competence content are dealt with very little:

– As a result of a systematic review of the literature, it was established that the frequency and scale of referencing to digital competence from a legal standpoint in international educational research is low, scholars mostly analyze educational laws, less – copyright, almost do not study general issues of intellectual property (IP) law⁵. For example, Directive (EU) 2019/790 on Copyright in the Digital Single Market or The Digital Copyright Act (DCA) provide new modern knowledge and rules for actors in the digital market; and without the appropriate content and teaching methods, gaining this knowledge will be carried out in a more complicated and ineffective way.

– According to the results of a systematic review of scientific papers on humanities and general databases, it was found that among the references to intellectual property rights (IPR), copyright and the general term “intellectual property” prevail, while the scale of references is mostly limited to mentions; in the scientific context of research, the papers are aimed at revealing purely pedagogical issues in the vast majority, fewer studies contain the predominant aspects of socio-economic, legal, engineering, philosophical, and psychological issues, respectively⁶.

2 CARRETERO, S., VUORIKARI, R., & PUNIE, Y. DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use (No. JRC106281). Joint Research Centre (Seville site), 2017.

3 BOTTURI, L. “Draw the Internet”: A visual exploration of how children think an everyday technology. *Journal of Media Literacy Education Pre-Prints*, 2021. Retrieved from <https://digitalcommons.uri.edu/jmle-preprints/7>

4 OECD. The OECD Framework for digital talent and skills in the public sector. OECD Working Papers on Public Governance, 45, 2021. Retrieved from <https://doi.org/10.1787/4e7c3f58-en>

5 SHMATKOV, D. Legal aspects of the content of digital competence: A systematic review of literature. *Law and innovative society*, 1(16), 2021, 169-176. DOI:10.37772/2309-9275-2021-1(16)-23.

6 SHMATKOV, D. & YEFREMOVA K. A study of trends in the analysis of intellectual property rights in the context of improving digital literacy of citizens. Scientific notes of Lviv University of Business and Law. Economics Series. Legal Series, 29, 2021, 11-19. <http://doi.org/10.5281/zenodo.5106111>

The Digital Competence Framework for Citizens DigComp 2.1.^[7] is widely implemented in European countries. It contains competence areas such as Information and data literacy, Communication and collaboration, Digital content creation, Safety, and Problem solving. This competency framework mentions the need to study IPR, in particular competence 3 “Copyright and licenses” in area 3 “Digital content creation”, which provides an understanding of “how copyright and licenses apply to data, digital information and content”. In the UNESCO Global Media and Information Literacy Assessment Framework⁸, along with the two mentions of IP, only the definition of the term “copyright” is given. Microsoft Digital Literacy (ver. 4) developers pay attention to copyright and mention the general term “intellectual property”. From the above brief overview, it is clear that two related research questions (RQ) arise:

– RQ1: Is the term “Copyright” synonymous with the notion of “Intellectual Property” when we talk about it in terms of digital competence?

– RQ2: Is the study of copyright enough to create “high-quality education content”¹⁰ in the field of intellectual property?

In this article, we try to justify that the answer to both questions is “no”, because the Digital Era does not limit the generation of intellectual property to copyrightable works and that is why the learning content can be greatly expanded in this context. Before trying to answer the research questions in detail, it is necessary to critically assess the representation of IP in the scientific literature in the content of digital competence frameworks.

World Intellectual Property Organization¹¹ describes objects of IP such as patents for inventions, industrial designs, trademarks and geographical indications, copyright and related rights, in addition, IP in various jurisdictions of the world include utility models, innovative proposals, trade secrets, varieties of plants, breeds of animals, scientific discoveries, and layout-designs of semiconductor integrated circuits, etc. On the other hand, in the majority of scientific research IP issues in the context of digital competence are considered in terms of copyright or the specific term “copyright or intellectual property”, which is used to emphasize the importance of copyright and which dilutes the meaning of other IP.

In some cases, we see an inexplicable shift from industrial property to copyright. For example, the structure of transversal competence for digital readiness

7 CARRETERO, S., VUORIKARI, R., & PUNIE, Y. DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use (No. JRC106281). Joint Research Centre (Seville site), 2017.

8 UNESCO. Global Media and Information Literacy Assessment Framework: country readiness and competencies, 2013. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000224655>

9 Microsoft Corporation. Microsoft Digital Literacy (ver. 4) Instructor’s Manual, 2014.

10 European Commission. Digital Education Action Plan 2021-2027. Resetting education and training for the digital age, 2020. Retrieved from https://ec.europa.eu/education/sites/default/files/document-library-docs/deap-communication-sept2020_en.pdf

11 World Intellectual Property Organization. What is intellectual property?, 2020. Retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_450_2020.pdf

and development of human capital in engineering education¹², which consists of innovative, entrepreneurial, and digital competencies contains only the generally accepted cliché “copyright and licenses” without mentioning industrial property (patents for inventions, industrial designs, trademarks, etc.). It is certainly necessary to agree that copyright is associated with education¹³, but isn’t industrial property relevant, for example, to engineering education where innovation matters? Although scholars believe that industrial property penetrates the content of engineering education from ideas through inventions to innovations¹⁴ and the literacy of citizens is positively associated with the number of patent applications¹⁵, but in the majority of the cases, these aspects are neglected in the content of digital competence frameworks. Another example is a study that revealed that among the employee’s knowledge of IP employers prefer patent law and equally less copyright and trademarks¹⁶, but in this case the scientific interest was also focused more on copyright.

In some cases, IP is called “copyright” by the authors and vice versa¹⁷, sometimes “copyright and intellectual property” is an indivisible unit¹⁸, sometimes the

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13 PUERTA, M. P. Aprendizaje colaborativo con TIC y las excepciones y limitaciones al derecho de autor: Colombia. *La Propiedad Inmaterial*, 29, 2020, 117-136. DOI:<https://doi.org/10.18601/16571959.n29.05>

14 MAGID, A. The road to interactive patent searching at an American University in the UAE. In 2016 IEEE Global Engineering Education Conference (EDUCON), 2016, 438-442. DOI: [10.1109/EDUCON.2016.7474590](https://doi.org/10.1109/EDUCON.2016.7474590)

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15 DIEBOLT, C. & HIPPE, R. The long-run impact of human capital on innovation and economic development in the regions of Europe. *Applied Economics*, 51(5), 2019, 542-563. <https://doi.org/10.1080/00036846.2018.1495820>

16 BURKELL, J. A., FORTIER, A., DI VALENTINO, L., & ROBERTS, S. T. *Enhancing key digital literacy skills: Information privacy, information security, and copyright/intellectual property*. Canada: Social Sciences and Humanities Research Council, 2015. Retrieved from <https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1038&context=fimspub>

17 MICROSOFT CORPORATION. Microsoft Digital Literacy (ver. 4) Instructor’s Manual, 2014.

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18 BURKELL, J. A., FORTIER, A., DI VALENTINO, L., & ROBERTS, S. T. *Enhancing key digital literacy skills: Information privacy, information security, and copyright/intellectual property*. Canada: Social Sciences and Humanities Research Council, 2015. Retrieved from <https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1038&context=fimspub>.

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TOMCZYK, Ł. Skills in the area of digital safety as a key component of digital literacy among teachers. *Education and Information Technologies*, 25, 2020, 471-486. <https://doi.org/10.1007/s10639-019-09980-6>

issues of IP in the content of digital competence are narrowly referred to as issues of enforcement of copyright¹⁹, for example, stealing photographs, downloading movies or music without paying²⁰ and academic plagiarism²¹, etc.

For further theoretical discussions on the above-mentioned approaches to the representation of IP in the content of digital competence frameworks, this article is aimed at studying expert opinions in establishing the types of IP and corresponding legal relations that arise in the digital space and require attention in the educational context.

The structure of the article reflects the results of a survey of experts in the field of law, discussion of their answers, opinions of the authors, and summarizes proposals for improving the content of digital competencies in the field of intellectual property.

I. METHODOLOGY

A. DESIGN AND PARTICIPANTS

To study expert opinions in establishing the types of IP and the corresponding legal relations that arise in the digital space and require attention in the educational context, we conducted a survey that included three main questions:

– Question 1 (a question with the ability to choose one or more answers). Mark the intellectual property used in the digital space: Literary work; Speech, lecture; Database; Music; Dramatic work; Pantomime, a choreographic work; Audiovisual work; A work of fine art; A work of architecture; Device; System of interacting devices; Building; Product; Substance; Strain of microorganism; Plant or animal cell culture and other biological material; Method of manufacturing or processing of product; Method of product quality control; Method of transformation of matter, energy, data; Method of measuring device parameters, diagnosing; Method of treatment; Process control method; New application of a known product or process; Appearance of the product or its part; Trademark represented by words; Trademark represented by letters; Trademark represented by sounds; Trademark represented by pictorial elements; Trademark represented by colors; Trademark represented by the form of goods; Product package; Layout-designs of semiconductor integrated circuits; Name of place of origin of goods; Variety of plants; Animal breed; Trade secret; Scientific discovery; Innovative proposal.

19 CHINIEN, C., & BOUTIN, F. Defining essential digital skills in the Canadian workplace. Human Resources and Skills Development Canada, 2011.

20 E-SAFETY SUPPORT REPORT. What every teacher needs to know about digital literacy, 2013. Retrieved from [https://www.mdtc.co/wpcontent/uploads/2015/03/ess_report_WETNTK_about_Digital_Literacy_2013 .pdf](https://www.mdtc.co/wpcontent/uploads/2015/03/ess_report_WETNTK_about_Digital_Literacy_2013.pdf)

21 OUAHIDI, L. M. Constraints on developing digital literacy skills in higher education. *International Journal of Linguistics, Literature and Translation*, 3(2), 2020, 197-205. DOI: 10.32996/ijllt.2020.3.2.22

– Question 2 (an open-ended question). In your opinion, what aspects of the use of intellectual property are the most important in the digital space? Please list the aspects in order of priority, starting with the most important.

– Question 3 (a question with the ability to choose one or more answers). Specify the objects of intellectual property rights the content of which needs to be presented within digital competence frameworks for citizens: Copyright; Scientific discoveries; Inventions, utility models; Industrial designs; Layout-designs of semiconductor integrated circuits; Varieties of plants, breeds of animals; Trademarks; Geographical indications; Trade secrets; Innovative proposal.

To determine a sufficient amount of necessary information for the purpose of didactic reduction, Question 1 contained a detailed description of each IP object and Question 3 represented generalized names of that objects.

We also collected data on the sex and age of the respondents.

Law professors with more than 3 years of experience from the following Kharkiv (Ukraine) universities were invited to fill out the survey: Yaroslav Mudryi National Law University; Kharkiv National University of Internal Affairs; STEP Computer Academy. This choice is conditioned by the requirement to understand both the legal issues of the digital environment and the educational needs of society.

B. TOOLS AND PROCEDURE

The survey was distributed to 42 professors via email in July 2021. Seven calendar days were allotted to fill out the survey. The survey (presented in Ukrainian) was filled out in the Google Forms and the results were saved on the Google Drive. Later, when the data were collected, the results were processed using the methods of mathematical statistics via IBM SPSS.

II. RESULTS

After the deadline, we received 25 completed forms, of which 4 were invalid because they either completely duplicated other forms or were used as trial attempts (for example, the answer to the open-ended question and the age question contained the word “test”). The results of this study are based on an analysis of 21 forms, which accounted for 50 % of the invitations originally sent out.

The results of answers to Question 1 and Question 3 are presented in Table 1.

TABLE I. ANALYSIS OF THE FREQUENCY OF RESPONSES

THE ANSWER TO THE QUESTION	POSITIVE, %	NEGATIVE, %
Question 1		
Literary work	90,5	9,5
Speech, lecture	90,5	9,5

THE ANSWER TO THE QUESTION	POSITIVE, %	NEGATIVE, %
Database	81,0	19,0
Music	85,7	14,3
Dramatic work	47,6	52,4
Pantomime, a choreographic work	38,1	61,9
Audiovisual work	81,0	19,0
A work of fine art	71,4	28,6
A work of architecture	23,8	76,2
Device	33,3	66,7
System of interacting devices	28,6	71,4
Building	9,5	90,5
Product	19,0	81,0
Substance	9,5	90,5
Strain of microorganism	19,0	81,0
Plant or animal cell culture and other biological material	19,0	81,0
Method of manufacturing or processing of product	33,3	66,7
Method of product quality control	42,9	57,1
Method of transformation of matter, energy, data	47,6	52,4
Method of measuring device parameters, diagnosing	38,1	61,9
Method of treatment	28,6	71,4
Process control method	47,6	52,4
New application of a known product or process	38,1	61,9
Appearance of the product or its part	47,6	52,4
Trademark represented by words	57,1	42,9
Trademark represented by letters	52,4	47,6
Trademark represented by sounds	42,9	57,1
Trademark represented by pictorial elements	52,4	47,6
Trademark represented by colors	42,9	57,1
Trademark represented by the form of goods	23,8	76,2
Products package	9,5	90,5
Layout-designs of semiconductor integrated circuits	14,3	85,7
Name of place of origin of goods	38,1	61,9
Variety of plants	9,5	90,5
Animal breed	9,5	90,5
Trade secret	42,9	57,1
Scientific discovery	57,1	42,9
Innovative proposal	33,3	66,7
Question 3		
Copyright	100	0
Scientific discoveries	61,9	38,1
Inventions, utility models	95,2	4,8
Industrial designs	66,7	33,3
Layout-designs of semiconductor integrated circuits	33,3	66,7
Varieties of plants, breeds of animals	14,3	85,7
Trademarks	81,0	19,0

THE ANSWER TO THE QUESTION	POSITIVE, %	NEGATIVE, %
Geographical indications	47,6	52,4
Trade secrets	61,9	38,1
Innovative proposal	23,8	76,2

Non-parametric Cochran's Q test (which is used for only two possible outcomes) regarding the coherence of the results of Question 1 and Question 3 showed the absence of the group effect (Literary work; Speech, lecture; Database; Music; Dramatic work; Pantomime, a choreographic work; Audiovisual work; A work of fine art; A work of architecture) on (Copyright); the absence of the group effect (Device; System of interacting devices; Building; Product; Substance; Strain of microorganism; Plant or animal cell culture and other biological material; Method of manufacturing or processing of product; Method of product quality control; Method of transformation of matter, energy, data; Method of measuring device parameters, diagnosing; Method of treatment; Process control method; New application of a known product or process) on (Inventions, utility models); the absence of the group effect (Appearance of the product or its part; Trademark represented by words; Trademark represented by letters; Trademark represented by sounds; Trademark represented by pictorial elements; Trademark represented by colors; Trademark represented by the form of goods; Products package) on (Trademarks); the presence of the group effect (Variety of plants; Animal breed) on (Varieties of plants, breeds of animals). Analysis of the reliability of the survey according to the criterion of Alpha Cronbach, carried out according to the results of Question 1 and Question 3, showed high reliability of the results, Cronbach's = 0,88.

The following answers were received to Question 2 (summarized):

- The need to improve and to indicate the existing legal regimes of IP protection (five first places, three second places).
- Copyright protection (four first places, two second places).
- Difficulty in identifying the copyright holder and the scope of rights (three first places, one second place, one fourth place).
- Protection of trademarks (two first places, one second place, one third place).
- Opportunities for convenient distribution of works and rights (two first places, one second place).
- Lack of understanding of the value of IP in society (two first places).
- Protection of the inventions and utility models (one first place, two third places).
- Form of software protection (one first place).
- High prevalence of IP in the digital space (one first place).
- Difficulty in detecting IP violations (one second place, two third places, one fourth place)
- Protection of works created by artificial intelligence (one second place).

- Complexity of compensation for loss from violations of IPR (one third place, one fifth place).
- High risk of IPR violations (one third place).
- Protection of industrial designs (one fourth, one fifth place).

Among the respondents there were 11 men and 10 women. We found no gender or age patterns. The age of the respondents is from 25 to 68 years old, the average age is 41,2 years.

III. DISCUSSION

The results obtained confirm the previously formulated conclusions²² that the representation of IP in digital competence frameworks cannot be limited by copyright and licenses, although these aspects are important. So, if we analyze the results based on the division of IP into industrial property and copyright²³, experts considered that copyright should be displayed in the frameworks in 21 cases, and in 62 (on average of 15,5 per the object) cases they pointed out inventions, industrial designs, trademarks, and geographical indications. While copyright, according to the experts, is more important than other IP objects in the digital space, the difference is not significantly prevailing – 4 first places, 2 second places of copyright versus 3 first places, 1 second place, 3 third places, 1 fourth place, 1 fifth place of industrial property.

Researchers draw attention to the lack of literacy in the field of copyright²⁴, but similar amount of research can be found in relation to other IP²⁵. Most likely, the approach of considering IP in the variety of its objects is the most adequate

22 SHMATKOV, D. Analysis of the Content of Intellectual Property Rights Presented in The Digital Competence Framework for Citizens DigComp 2.1. *Academia Letters*, Article 1496, 2021. DOI: 10.20935/AL1496

23 World Intellectual Property Organization. What is intellectual property?, 2020. Retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_450_2020.pdf

24 CAPPUCCIO, G., & COMPAGNO, G. Developing support teachers' digital competencies for an inclusive citizenship. *Media Education*, 12(1), 2021, 43-51. DOI: 10.36253/me-10243.

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one²⁶, as a deep consideration of IP issues in the formation of digital competence ensures greater interest and academic achievement of learners²⁷. Compared, for example, to the Digital Competence Framework for Citizens DigComp 2.1. or the UNESCO Global Media and Information Literacy Assessment Framework, developers of the Digital Intelligence (DQ) Framework have demonstrated a deeper multidisciplinary approach and have included in the content of the framework the ability to understand and manage intellectual property rights (*e. g.*, copyrights, trademarks and patents) while using or creating the content and technologies²⁸.

As we talk about accelerating innovation in the Digital Age²⁹ novelty, industrial applicability (characteristics of industrial property) of innovations are the first links in the chain of bringing new products and processes to the market. Therefore, it is difficult to agree with the opinion that instead of focusing on indicators such as creation of IP (such as patents) other ways of tracking and measuring innovation (such as adoption of innovations) should be implemented³⁰. It is also difficult to agree that a teacher's innovativeness should be assessed using a digital competence framework where only copyright is mentioned³¹. Patents still matter – patents protect Coursera and EDX learning platform technologies, various blockchain learning management methods, interactive e-books, augmented reality systems, etc. Trademarks are the most frequently registered IP in the world and are central, for example, to protecting the original URL names and other companies' identity means. Patents and trademarks could be applied to both breakthrough innovations, such as the use of robots in teaching process³², and to regular educational innovations such as technology of verification and identity control during online exams³³.

26 PALFREY, J., GASSER, U., SIMUN, M., & BARNES, R. F. Youth, creativity, and copyright in the digital age. *International Journal of Learning and Media*, 1(2), 2009, 79-97. Retrieved from <https://dash.harvard.edu/handle/1/3128762>

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32 LÓPEZ BELMONTE, J., POZO SÁNCHEZ, S., FUENTES CABRERA, A., & VICENTE BÚJEZ, M. R. Innovative scenarios in physical education: body and musical expression work mediated by robotics. *RETOS-Nuevas Tendencias en Educación Física, Deporte y Recreación*, (38), 2020, 567-575.

33 MARTÍNEZ, R. M. Tecnología de verificación de identidad y control en exámenes

According to the experts, an understanding of the essence of trade secrets in the digital space has an important educational value, which confirms the previously expressed opinions³⁴. Regarding scientific discoveries we assume that the high rank of this object in the list is due to a large innovative leap conditioned by the development of technologies and the creation of a new digital innovation space where scientific discoveries can accelerate and transform.

It is also noteworthy that the importance of an IP object in the digital space does not repeat its importance in the framework of digital competence. In both absolute percentage and Cochran's Q test, this study shows that not all copyright and industrial property are subjects to learning. While the legal regimes do not differ significantly within each subject matter (for example, literary work and music protection are not different), there are different ways to create, infringe, protect, distribute and commercialize IPR depending on the type of work. Therefore, the learning content can be approached by didactic reduction³⁵ depending on the direction of study, the availability of study time, and other factors of the educational process.

Digital skills include the formation of critical thinking about the use of digital technologies by analyzing opportunities, limitations and risks, as well as adhering to ethical and legal principles, including IP³⁶. An important result of this study is the identification of significant aspects that do not describe specific IP objects but can be reflected in digital competence frameworks.

National and international regulatory frameworks governing confidentiality, information security and IP are complex and constantly evolving, what places additional pressure on organizations that have to stay informed about the relevant regulatory and legal responsibilities³⁷. Legislative improvements can be presented within the frameworks since it is important to understand the current changes, for example, which are described by The Digital Copyright Act of 2021, which improves the US copyright law, or the improvements described in Directive (EU) 2019/790 on Copyright in the Digital Single Market or in other important and new national or international IP documents. The content of digital competence frameworks should be adaptive to possible changes, such as obtaining rights to

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34 VILLASENOR, J. Intellectual property awareness at universities: Why ignorance is not bliss. *Forbes*, 2012. Retrieved from <http://www.forbes.com/sites/johnvillasenor/2012/11/27/intellectual-property-awareness-atuniversities-why-ignorance-is-not-bliss/>

35 SHMATKOV, D., BIELIKOVA, N., ANTONENKO, N. & SHELKOVYJ, A. Developing an environmental monitoring program based on the principles of didactic reduction. *European Journal of Geography*, 10(1), 2019, 99-116.

36 MADALINA, C. Improving Knowledge Management Through 21st Century Digital Skills. *Annals-Economy Series*, 2, 2021, 143-157.

37 BURKELL, J. A., FORTIER, A., DI VALENTINO, L., & ROBERTS, S. T. *Enhancing key digital literacy skills: Information privacy, information security, and copyright/intellectual property*. Canada: Social Sciences and Humanities Research Council, 2015. Retrieved from <https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1038&context=fimspub>

products produced by artificial intelligence or liberalizing the protection of functional software by the means of industrial property.

The issue of the difficulty of defining the scope of IPR has been partially resolved by studying licenses which scholars often mention in the relevant literature and which has already been presented in various frameworks. But clear identification of a licensor and a licensee requires higher skills. Understanding the scope of IPR, conditions of the fair use, means of detecting IPR violations and reducing (or increasing) risks of violations also requires additional knowledge and skills. Knowledge and skills in the field of IP are key to organizational and individual success in a developing society and in the labor market, where information is the main source, while ignorance of IP learning leads to reputational, temporal and financial losses³⁸.

The means of disseminating IPR per se are not within the scope of digital competency but are an important part of the digital space. Monetization of IPR through various social networks has already been sufficiently developed and implemented in the digital space, but it also requires literacy to navigate in, as well as understanding of the compensation systems for losses from violations of IPR. In this context there is a reverse movement from digital education as a strategy whose specific steps will ensure better protection of IPR through the digital competency that it forms³⁹, that is, as the subject area of IP inflates digital competence, technologies of the Digital Era improve legal relations in the field of IP.

Thus, the presented study describes significant prerequisites for revising and supplementing the content of the existing digital competence frameworks, and also provides theoretical inferences and empirical facts for new developments in the field.

The limitation of this study is a small sample of experts as well as a narrow geography which introduces a certain error in the possible interpolation of the results due to the specifics of regional state of legislation in the field of IP.

CONCLUSIONS

We see a wide variety of intellectual property issues permeating digital relationships. Various ICT innovations a priori cannot be limited only to literary, musical, artistic, educational or other copyrightable work. In addition, a number of IP enforcement cases and issues in the digital space are important which could also be reflected in digital competence frameworks.

So, the answer to RQ1 – Is the term “Copyright” synonymous with the notion of “Intellectual Property” when we talk about it in terms of digital competence? – is “no”, digital competency frameworks offer the study of important issues of creating and ensuring the use of digital products and processes, and in this case, the

38 *Id.*

39 LAZARIUC, C. Digital Education as a Strategy for the Protection of Intellectual Property Rights. *Eastern European Journal for Regional Studies*, 7(1), 2021, 132-155.

study of copyright will not determine the state of IP in general since in particular industrial property objects are not taken into account there.

The answer to RQ2 – Is the study of copyright enough to create “high-quality education content”⁴⁰ in the field of intellectual property? – is also “no”, since the functionality of digital technologies has gone far beyond the expression of the copyrightable subject matter. Learning by copying cannot lead to leadership in the development and creation of new and globally competitive products⁴¹.

In addition, this study has established the value of the possible inclusion of aspects to the content of digital competence frameworks such as modern legislative improvements, methods for identifying rightsholders, ways to conveniently distribute works and rights, the value of various IP objects, forms of software protection and issues of protecting works created by artificial intelligence in existing legal regimes, methods for detecting violations of IPR, and mechanisms for compensation of the losses from violations of IPR which correspond to the current level of development of relations in the digital space.

The prospect of further scientific research is the confirmation or denial of the presented results in comparative studies as well as the development of didactic recommendations for the inclusion of important aspects of IP in the current and future digital competence frameworks.

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