

# Designing a Tool for Economics Students Digital Competence Measurement

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## Abstract

The article is devoted to the essence, approaches, and tools for the development and measurement of economics students' digital competence. Apps of general and professional purpose according to their functionality and relevance for Ukrainian enterprises are generalized. The importance of the ability to select apps for a rational solution of professional tasks and the development of the digital competence of specialists are emphasized.

The results of the survey of students of the Poltava State Agrarian University (Ukraine) are presented, to determine the main problems, advantages, and needs in the development of their digital competence. Analysis of foreign approaches (DigComp, DigCompEdu, DigCompOrg, OpenEdu, DigCompConsumers, EntreComp, etc.) contributed to the creation of a framework for economics students' digital competence measurement. The framework covers the abilities (working with data, communication, content development, safety, problem-solving), indicators, and levels of digital competence development. The expert evaluation revealed that most experts (93,4%) evaluate the proposed project positively, and it can serve as a basis for developing narrower frameworks for specific economic or related specialties.

## Keywords

Digital Competence, Economics Students, Future Economists, Professional Apps, Digital Competence Measurement, Digital Competence Framework, Survey, Expert Evaluation

## 1. Introduction

At the present stage of the society development, European integration processes and socio-economic transformations, exacerbation of the political and economic situation, intensive development of digital technologies, distribution of e-commerce, etc., the need for improvement, ensuring the proper level of professional training of economics specialists is of great importance.

The modern economist is one of the main participants of the digital economy, the fourth industrial revolution "Industry 4.0", which lays a number of tasks and functions: analytics, forecasting, strategic planning, financial accounting, reporting, etc. In this regard, the importance of information and communication technologies (ICT) increases significantly, as they facilitate the automation and optimization of economic processes, apply effective management methods in economic activity.

In 2008, within the strategy "Education & Training 2010", it was noted that lifelong learning strategies must meet the growing need to form digital competence at the proper level for all specialists and students [14]. In the "Digital Agenda for Europe" [7], it is currently indicated that about 90% of professions require at least basic ICT skills. Regarding specialists in the economic industry, the development of their digital competence is of obvious necessity. In particular, in the research of 2019, which

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involved more than 4.000 specialists of the economic industry all around the world [25], it was noted that 89% of respondents are convinced of the need to form digital skills for specialists in their professions. At the same time, 37% of them claim to be lacking these skills.

Economics students' training should be aimed at the development of topical competencies, including the ability to apply modern ICT and professional apps in the field of economic education and professional training. The priority of future economists' training in the conditions of the information society among other things should be the ability to navigate in the information space, apply modern data processing methods, to optimize their own activities by means of modern ICT. In this case, an important element we consider the introduction of an appropriate competence framework, in particular digital competence framework, which allows both to determine the goals, tasks, content blocks at the beginning of the development of educational programs, and to compare the results of learning with a given standard, entering the corresponding adjustments in the educational process.

Scientific interest in the problem of development and measurement of economics students' digital competence is investigated in the studies of the range of scientists. In particular, the subject of study was the analysis of the content of the "digital competence" concept, especially the evaluation of its development level (Ala-Mutka K. [14], Carretero S. [22], Ferrari A. [1], Glazunova O. [18], Havrilova L. [16], etc.).

A wide range of research concern the problems of future economists' professional training in using modern technologies, various aspects of economic education digitalization: training of future economists to managerial activity by means of electronic social networks (Khomik O. [19]); features of e-learning in economic and business education (Batalla J. [13]); formation of future economists' Internet communications culture (Poiások T. [24]); analysis of educational programs, key competencies, and problems of digitalization of future accountants' training (Szadziewska A. [3]; Tudor C. [5]; Gulin D. [6]), etc. In the documents of European significance [4]; [22]; [10]; [11]; [2]; [20], etc.] a number of frameworks are presented to measure digital competence both on personal (DigComp, DigCompEdu, DigCompConsumers, et al.) and institutional (DigCompOrg, OpenEdu, et al.) levels. Along with this, tools for the development and measurement of the economics students' digital competence require a deeper study.

The **purpose** of the article is to generalize apps of general and professional purpose, that is expedient to use in economics students' training; through analyzing modern approaches to the definition of the future economists' digital competence and measurement of its levels, to design a tool for economics students' digital competence measurement.

## 2. The presentation of main results

### 1.1 ICT tools for the modern economist's professional activity

Future economists should be able to act in conditions of competition and professional risk, be prepared for constant updating and improving their competence level throughout life. Of course, the development of digital competence, as a complex and integrated characteristic of the specialist, is a process of constant development, which is not finished after passing a certain training course, and continues throughout life.

During training, it is important to ensure that the learning content corresponds to the professional context. The application of specialized software, economically oriented information systems allows bringing economics students to a deeper understanding of processes in the enterprise, to exercise in implementing various financial and analytical operations, data processing, accounting, reporting, and more.

According to the general approach, we distinguish two main groups of apps: general and professional purposes. The first group includes applications intended and used to solve a range of different information tasks (text, table and graphic processors, data management systems, network tools, etc.). The second group includes apps that allow solving professional tasks within a separate subject area.

Among the main types of **general-purpose apps**, which is expedient to be used in the economics students' training, we consider: *text editors and processors* – to work with text data (WordPad, MS Word, OpenOffice Writer, etc.); *table processors* – to work with text and numerical data, accounting

(MS Excel, OpenOffice Calc, LibreOffice Calc, etc.); *graphic editors* – to work with static graphics (Adobe Photoshop, Adobe Illustrator, MS Picture Manager, Corel Draw, etc.); *tools for creating multimedia presentations* – to work with dynamic graphics, animation, text, audio, video format (MS PowerPoint, OpenOffice Impress, LibreOffice Impress, etc.); *database management systems* – to organize the structured databases, their reliable storage, and administration (MySQL, Oracle Database, Firebird, Interbase, MS SQL Server, etc.); *network tools* – to work with web and cloud services, distributed storage, data exchange, networking, etc. (web browsers, search engines, postal clients, text and video chats, electronic social networks, cloud data storages, etc.); *electronic educational resources* – for constant professional self-development, professional competence increasing (electronic manuals, reference books, electronic resource repositories, MOOCs, etc.).

Among the main types of **professional-purpose apps** for economists, we summarized modern tools<sup>1</sup> by their essence, functionality and relevance for enterprises:

- Tools of accounting for small enterprises – for accounting data entering and processing, support of electronic document circulation, reporting (Ajour-DOC, Finansy bez problem, iFin, Info-bukhhalter, Microsoft Dynamics 365, etc.);
- Tools of accounting for medium and large enterprises – for primary accounting automation, establishing electronic document circulation, automation of calculation, work with accounting accounts (1S: Bukhhalteriia 8, Abacus Financial, Ajour-DOC, Halaktyka-ERP, HCL Notes/Domino, ISpro, LokOFFICE, Microsoft Dynamics 365, Parus-Pidpriemstvo 8, etc.);
- Automation of accounting in retail and wholesale trade – to evaluate the goods according to various methods, by purchasing or selling prices. Options to install a few prices for one product. Possibility of reevaluation, lists, and goods write-offs (1S: Bukhhalteriia 8, 1S: ERP Upravlenye predpriyatym, 1S: Upravlenye torhovlei 8, BEST-5, Halaktyka-ERP, LocOFFICE-WMS, Microsoft Dynamics 365, etc.);
- Tools of financial statements preparation – the possibility of creating specialized reports by different requests (1S: Bukhhalteriia 8, BEST-5, Halaktyka-ERP, M.E.Doc, OPZ, Sonata, etc.);
- Universal accounting systems – analytical accounting, labor accounting and wages, currency accounting (1S: Bukhhalteriia 8, Ajour-DOC, Debet Plus, GranDoc, Info-bukhhalter, etc.);
- Tools of automation of workplaces (local use) – the implementation of certain accounting tasks at the enterprise (1S: ERP Upravlenye predpriyatym, 4K-Zarplata, Global-HRM, Parus-Zarplata, TIS-Zarplata, Zarplata-DOS, etc.);
- Tools of financial analysis automation of the enterprise and assessment of investment efficiency – the possibility of a comprehensive assessment of activity, overall financial condition (financial stability, liquidity, capital efficiency, etc.), the study of the influence of external factors on the processes of the enterprise, etc. (Alt-Finansy (Summ), Alt-Invest (Summ), Project Expert, Terrasoft-CRM, etc.);
- Complex banking software – automation of banking institutions functions (ABS Scrooge, CSBI, ISAOD Bank, ProgramBank, Terrasoft XRM Bank, etc.);
- Tools of the enterprise management – management accounting, planning, customization, etc. (CloudSuite Industrial (SyteLine), DeloPro, Halaktyka-ERP, Microsoft Dynamics 365, Oracle's JD Edwards EnterpriseOne, Oracle's PeopleSoft Applications, SAP ERP, Terrasoft-CRM, etc.);
- Financial analytical systems – financial analysis based on accounting data, computerization of external and internal audit tasks (1S-AFSP, Finansovyi analityk, KM-Investor, etc.).

Application of the applied professional-purpose apps allows simulating future professional activities of economists through modeling of economic objects, providing opportunities for solving real professional tasks (implementation of analysis, preparation of statistics, business plans, and reports, the performance of professional, scientific, and economic creative tasks, etc.).

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<sup>1</sup> The apps' names are transliterated. The original names and the additional information can be found on the official websites (click on an appropriate app's name).

## 1.2 The state and peculiarities of the development of economics students' digital competence based on the Poltava State Agrarian University (Ukraine)

The concept of “future economist” or “economics student” is quite broad in content and covers specialists in several adjacent specialties. For example, in Ukraine future economists include students studying in the following specialties<sup>2</sup>: “Economics”, “International Economic Relations”, “Accounting and Taxation”, “Finance, Banking and Insurance”, “Marketing”, “Entrepreneurship”, “Trade and Stock Exchange Activity” and others.

Being a staff of the Poltava State Agrarian University (PSAU), we surveyed students of our institution, to find out their overall level of satisfaction with teaching disciplines, identify the main problems, advantages, and needs in the process of developing their digital competence. The total number of respondents amounted to 71 people – students of the specialty 071 “Accounting and Taxation”, the first (bachelor) level of higher education, 19-23 years. Some results of the survey are more expanded in the article by authors [23].

It should be noted that to ensure the proper level of information, teaching, and methodological support in PSAU, a system of measures has been introduced, among which:

- support for distance learning portal based on LMS Moodle (<https://moodle.pdaa.edu.ua/>);
- support for the electronic library of PSAU (<http://lib.pdaa.edu.ua/>), which fund is constantly renewed;
- PSAU site support (<https://www.pdaa.edu.ua/>) with relevant information on educational, scientific, publishing and other activities of the institution;
- support for corporate mail with a high degree of reliability and safety;
- support for PSAU electronic repository that contains the results of research works, scientific publications of lecturers and postgraduates, students' articles and qualification works, etc.;
- providing educational subjects with unlimited Internet access, creating a wireless access point in the entire institution;
- application of ICT and professional-purpose software in the educational process.

Information, teaching, and methodological support in PSAU meets licensing requirements, has relevant content, takes into account, and attracts the functionality of modern ICT.

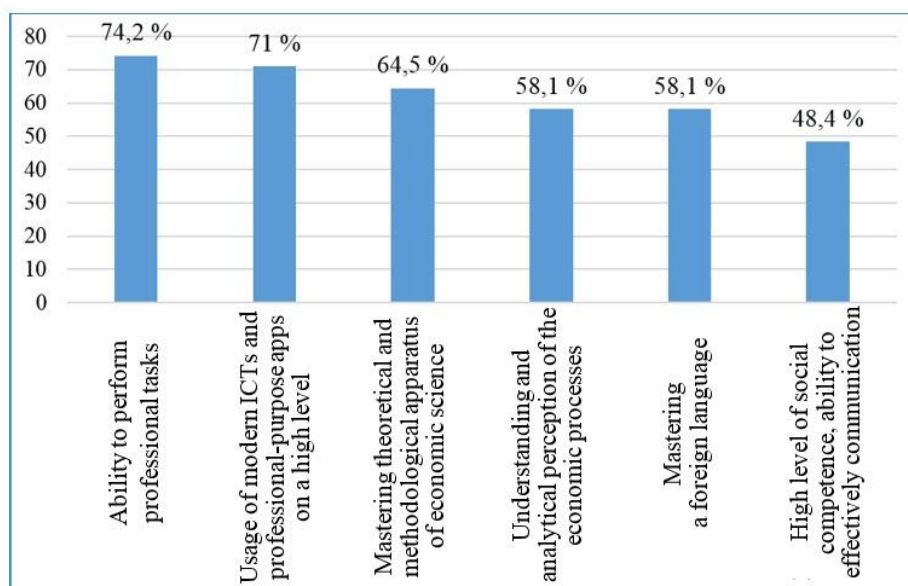
Within our survey, we proposed students choose the main features necessary for the economist's professional competitiveness. These features are given in Fig. 1. As you can see (Fig. 1), the students attributed the ability to use modern ICT at a high level to the priority characteristics of the economist's professional competitiveness.

Then, we offered students to evaluate their level of competence on the use of modern ICTs and apps and the level of potential ability to use them in professional activity. The vast majority of respondents appreciated themselves as a “confident user” (87.1%), which can work with many types of software and master easily informatics disciplines in the institution; 9.7% appreciated themselves as an “average user” who can work with separate applications and master more or less successfully informative disciplines in the institution; 3.2% appreciated themselves as “experts”, who are freely working with many apps, and their level of knowledge and skills are often ahead of the knowledge offered in the institution.

In addition, students were invited to assess their experience of using various apps, both for general and professional purposes. The list of software was concluded taking into account its expediency in the professional activities of future economists. The obtained data have shown that all (100%) students are free to use postal services (in particular Gmail and Freemail) and electronic social networks (including Facebook). The vast majority (93.3%) use messengers (in particular, Viber, MSN Messenger) and the MS Word text processor confidently. Much of the respondents are freely using the MS Excel Table Processor (86.7%) and MS PowerPoint Presentations Editor (83.3%). This result was quite predictable since students systematically use the specified software to carry out a variety of educational tasks, communications with lecturers, as well as for interpersonal communication.

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<sup>2</sup> According to the [list of branches of knowledge and specialties of Ukraine](#), 2015.



**Figure 1:** Features necessary for the economist's professional competitiveness (to the economics students' opinion)

Regarding cloud data storages, 60% of the respondents use them confidently; 50% use the MS Access Database Management System and a universal professional accounting system 1C confidently. Other professional programs, in particular, "Parus" and "Halaktyka-ERP" are freely used by 10% and 3.3% students respectively.

Many professional apps that are in demand in the market are not familiar to students. In particular, the name of such a program as Terrasoft-CRM was heard by 95% of students for the first time, OPZ – 90%, DeloPro, and Microsoft Dynamics 365 – 80%, SAP ERP – 70%, "Halaktyka-ERP" – 45%.

The survey showed that 74.2% of students consider their level of digital competence sufficient for use of ICTs in professional activities. At the same time, almost a quarter of respondents (25.8%) believe this level is insufficient. 90.3% of students responded that they need to increase their capabilities for the use of various apps for work in the economic industry.

Among the factors that will increase the level of economics students' digital competence, respondents noted the following: an increase in auditorium hours on informative disciplines (90%); introduction of special additional disciplines, electives of informative and professional orientation (63.3%); provision of available, free access to ICT and Internet at the institution (36.7%); provision of accessibility, free access to ICT and Internet access in a hostel (due to lack of own computer, complicated network access, etc.) – 20%; time increase for independent work (10%).

We believe that a pilot study conducted allows us to reflect the essence of the problem in general, to determine the relation and degree of satisfaction of students with PSAU approaches to the development of their digital competence as a competitiveness factor in the future.

### 1.3 Economics students' digital competence

According to European Recommendations 2006, digital competence (DC) is determined as one of the key lifelong learning competencies. Currently, there are different approaches to determining the concept of DC. In general, this concept can be defined as the ability of confident, critical, and creative use of modern ICT to achieve targets related to professional activities, employment, training, leisure, and/or participation in public life. In particular, in the study of Ala-Mutka K. [14] it is defined as "the ability to access digital media and ICT, to understand and critically evaluate different aspects of digital media and media contents and to communicate effectively in a variety of contexts. In Recommendation of the European Parliament and the Council [21], DC involves the confident and critical use of ICT for employment, learning, self-development, and participation in the Knowledge Society.

One of the most detailed definitions is proposed by Ferrari A. [1], who indicates that DC is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are

required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment.

According to Telecentre Europe, DC is an “umbrella” term to indicate many concepts: “digital literacy”, “computer literacy”, “e-skills”, “e-competence”, etc. Despite certain differences, in essence, they are combined in the concept of digital competence [8].

The DC is, as if, an overall competence, which allows obtaining other competencies (communication in native and foreign languages; knowledge of mathematics, the basics of science and technology; ability to study; cultural awareness and self-expression, etc.), and its development is an integral feature of a modern competitive specialist. In the conditions of transformation of markets, the economy digitalization, the technology of economic processes is particularly relevant for future economists. Thus, literature analysis showed that various researchers (Hubschmid-Vierheilig E. [9], Kongpradit K. [15], Scuotto V. [26], etc.) converge in mind that the ability to use ICT is an integral component of modern economics specialist training. Future economists should be able to act in competition and professional risk, be prepared for constant updating and improving their knowledge from the specialty in lifelong mode. The development of DC, as a complex and integrated characteristic of a person and a specialist in the economic sphere, is a continuous process, which does not end after passing a certain training course. At the same time, there is an important issue: how can we measure and evaluate the level of development of economics students' DC?

#### **1.4 Designing a framework for economics students' digital competence measurement**

We analyzed the main approaches to determining the level of specialists' DC development, in particular: Digital Competence Framework for Citizens (DigComp) [22]; Digital Competence Framework for Educators (DigCompEdu) [11]; Digital Competence Frameworks for Educational Organisations (DigCompOrg) [10]; Opening up Education: A Support Framework for Higher Education Institutions (OpenEdu) [2]; Entrepreneurship Competence Framework (EntreComp) [17]; Framework of the International Federation of Accountants [25]; [5]. An analysis of named approaches to determining the level of specialists' DC development, allowed us to identify the following:

- The frameworks are the basis for the development of narrower, profile frameworks, contribute to the unification of the understanding of the main categories, shared view of the reference results;
- Stakeholders (organizers of education, heads of educational institutions, etc.) can achieve reference results identified in the framework, in their own variational ways, to develop based on existing frameworks narrow, specify indicators according to their own needs;
- Frameworks can be used as a tool for comparing skills, competencies in national and international contexts;
- The frameworks vary according to the target direction, target groups: general frameworks (e.g., DigComp), focused (e.g., DigCompEdu), professional-oriented (e.g., Framework of the International Federation of Accountants);
- Frameworks can be created both to measure personality competence (e.g., DigComp, DigCompConsumers), and organizations as a whole (e.g., DigCompOrg, OpenEdu).

Thus, the field of frameworks application is quite wide: from policy development and strategic planning to designing curricula, as well as evaluation, monitoring, etc. An important function of frameworks is the opportunity to make sure that the person obtained the competencies necessary for full participation in modern society and socio-economic processes.

In general, the modern economist must:

- work with data of different formats;
- carry out effective communication via modern services;
- work with text and tabular processors, tools for creating presentations, databases;

- work with web and cloud services for distributed storage, data usage, and exchange, communication and networking, etc.;
- work with professional-purpose apps;
- comply with copyright and netiquette;
- adhere to the rules of cybersecurity and health-saving when working with digital tools;
- choose and use different digital tools and services for effective solving of professional tasks;
- choose electronic educational resources for constant professional self-development, increase in professional competence.

Taking into account the above approaches, we have developed a project of the framework for economics students' DC measurement (Table 1). The framework presents the abilities that form components of this competence (working with data, communication, content development, security, problem-solving), indicators, and development levels (low, basic, sufficient, and high).

If components 1-4 are of more general content, then component 5 ("problem-solving") relates directly to the professional activity of an economist. This component can be specified under a particular specialization within which the economics students' training is conducted.

Among the forms and methods of assessing the level of economics students' DC development, it is appropriate to apply: examinations (written and oral), testing (blank and computer), performing problematic tasks, preparing professionally-oriented projects, reports on educational and industrial practice, etc. The low level of a certain ability (indicator) is assigned a student who does not perform any of the indicators presented, basic level – if he/she performs at least 25%, sufficient level – performs from 25% to 80%, high level – performs more than 80%. For the convenience of calculations, in Table 1, we offer an approximate approach to determine the levels of development of respondents' DC for each of the five components.

**Table 1.**

The project of the framework for economics students' digital competence measurement

Component of digital competence	Indicator (formed abilities)	Levels			
		Low	Basic	Sufficient	High
1. Working with data	<ul style="list-style-type: none"> <li>- Create, copy, move, delete files/folders.</li> <li>- Find the necessary data of economic direction (educational, professional, etc.).</li> <li>- Find and process data received from professional official authoritative online resources.</li> <li>- Keep data (including on remote servers), organize, catalog them according to certain features, characteristics, etc.</li> </ul>	no abilities	at least 1 ability	at least 2 abilities	3-4 abilities
2. Communication	<ul style="list-style-type: none"> <li>- Conduct business correspondence via e-mail.</li> <li>- Carry out professional communication via electronic social networks (LinkedIn, Branchout, etc.).</li> <li>- Carry out professional communication via chats, messenger (Viber, Telegram, Messenger, or others).</li> <li>- Carry out professional communication via professional forums (e.g., <a href="http://profi.org.ua/forum.shtml">http://profi.org.ua/forum.shtml</a>, etc.).</li> <li>- Conduct online video meetings with colleagues and clients.</li> <li>- Place one's content on online platforms (professional, advertising, etc.).</li> <li>- Adhere to netiquette (norms of ethical behavior in online communications).</li> </ul>	no abilities	1-3 abilities	4-5 abilities	6-7 abilities

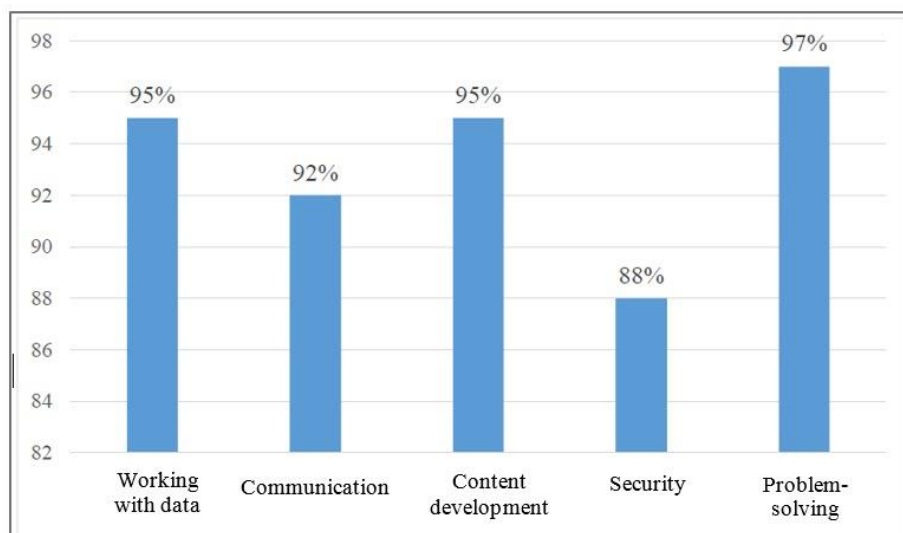
3. Content development	<ul style="list-style-type: none"> <li>- Create one's unique content of different formats.</li> <li>- Process an existing content created by others, improve it.</li> <li>- To be aware of authors and licensing laws and to adhere to them.</li> <li>- Create one's websites or blogs (e.g., for professional counseling, distribution of one's own experience, creating an electronic portfolio, etc.).</li> <li>- Work with text (creating / copying / moving / saving / removing fragments, text formatting, etc.).</li> <li>- Work with spreadsheets (work with formulas, application of macros for automation, construction diagrams, etc.).</li> <li>- Work with presentations (creation of slides: development of the concept, data structuring, application of text elements, images, audio, and video fragments, diagrams).</li> </ul>	no abilities	1-3 abilities	4-5 abilities	6-7 abilities
4. Security	<ul style="list-style-type: none"> <li>- To be aware of online risks and threats, ways of their safe avoidance, and prevention.</li> <li>- Adhere to the basic cybersecurity rules to protect one's computer (reliable passwords and their regular updates, ignoring suspicious links, the use of licensed software).</li> <li>- Apply special software to protect one's and corporate data (e.g., Anti-virus, firewall).</li> <li>- Adhere to the rules of healthcare when working with a computer.</li> </ul>	no abilities	at least 1 ability	at least 2 abilities	3-4 abilities
5. Problem-solving	<ul style="list-style-type: none"> <li>- Connect new devices (e.g., printer).</li> <li>- Install new operating systems and remove old ones.</li> <li>- Adjust software settings.</li> <li>- Search for work, distribute one's resume.</li> <li>- Establish customer relationships through a web canal.</li> <li>- Choose and apply software, online services accordingly with professional tasks.</li> <li>- Determine the directions that you need to improve for your digital competence improvement.</li> </ul>	no abilities	1-3 abilities	4-5 abilities	6-7 abilities

To determine the expediency of application of the designed framework in the process of assessing the level of economics students' DC development, an expert evaluation was conducted. The expert group included 12 people, among them educators (5 people), scientific staff (3 persons), graduates (2 persons), employers (bank manager – 1, entrepreneur – 1). Experts were selected taking into account the following requirements: awareness of the essence, specificity of future economists training; practical experience in using modern digital tools and apps in professional activity.

The evaluation was carried out according to each of the 5 components of DC: working with data, communication, content development, security, problem-solving. As a result, it has been established that most experts have positively evaluated the given framework. In particular, the 1st component (working with data) was positively evaluated by 95%, 2nd component (communication) – 92%, 3rd components (content development) – 95%, 4th component (security) – 88%, 5th component (problem-solving) – 97% (Fig. 2). The average arithmetic coefficient showed that the vast majority of experts (93.4%) evaluated the framework positively.

The presented framework for economics students' DC measurement can serve as a basis for developing a narrower specific framework for specific economic or related specialties.





**Figure 2:** The results of the expert evaluation of a framework for economics students' digital competence measurement (according to competence components)

### 3. Conclusions

Future economists should be able to act in competition and professional risk, be prepared for constant updating and improving their knowledge in lifelong mode. Application of specialized apps, economically oriented information systems in economics students' training allow to simulate future professional activities through modeling of economic objects and bring future economists to a deeper understanding of processes in the enterprise, to exercise in implementing various financial and analytical operations, data processing, accounting, reporting, etc.

We believe that for future economists it is important not only to be able to use the specified software but also to be able to compare different software products, compare their functional characteristics, to choose those that will resolve the professional task most optimally and rationally. We believe that this can be achieved by implementing a range of organizational and pedagogical conditions: 1) to provide a sufficient level of technical support (availability for educators and students of modern ICTs, multimedia complexes, broadband access to the Internet, licensed software of general and professional purpose; 2) to provide an organic implementation of ICT at various stages of the educational process: both in the study of informative disciplines, and during the study of the profile, economic disciplines; 3) to provide a system of measures at the level of educational institution and/or its structural subdivision that would encourage the participants of the educational process to increase their digital competence (removal of hours for educators to master specialized software, training on-line courses, etc.; carrying out competitions, olympiads for students; organization of specialized master classes, training, courses, programs, etc., aimed at deepening knowledge, skills for working with professional apps - both for students and educators, etc.).

The results of a survey of economics students showed that despite some experience in using apps for professional purposes, there is still the need to develop their digital competence (90.3% of respondents confirmed that they need it). Given this, the introduction of approaches to evaluating digital competence, the definition of students' "spaces" in the learning process with subsequent adjustment of the educational process is at time.

Analysis of foreign approaches (DigComp, DigCompEdu, DigCompOrg, OpenEdu, DigCompConsumers, EntreComp, etc.) contributed to the creation of a framework for economics students' digital competence measurement. The expert evaluation revealed the expediency of introducing the given framework in the process of economics students' training. Thus, the average arithmetic coefficient showed that the overwhelming majority of experts (93.4%) appreciated the framework positively.

We believe that digital competence is expedient to consider as a conception of a higher level than just the ability to use ICT. In the specialists' training, in particular future economists, it is important to integrate the skills of effective communication with the observance of netiquette, safe and health-saving

digital work, the ability to select and apply software accordingly to professional tasks, the desire to determine the directions to improve their digital competence.

Further research should be directed to experimental confirmation of the effectiveness of the developed framework and methodology for the economics students' digital competence development.

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