

UDC 378:027.7:004.77

BRESLAVETS O. Yu.

National Technical University "Kharkiv Polytechnic Institute" (Kharkiv, Ukraine),

e-mail: breslavetsoleksandr@gmail.com, ORCID 0000-0001-8704-0678

HLAVCHEVA Yu. M.

Scientific and Technical Library, National Technical University "Kharkiv Polytechnic Institute"

(Kharkiv, Ukraine), e-mail: yuliia.hlavcheva@khpi.edu.ua, ORCID 0000-0001-7991-5411

Determining Implementation Approaches of Effective Digital Competencies Training

Objective. To analyse approaches to the organization of user training that can be applied in distance learning of digital competencies. Mastering digital competencies by users is known to be one of the important tasks not only for higher education but also for the whole society. Therefore, we consider it important not only to provide quality training, but also to encourage more users. **Methods.** Empirical methods are applied. The article examines the "user roadmap" - the steps from user identification of necessary competences to quality mastery of competences. At every step, the user needs help. **Results.** Based on the analysis done, recommendations have been developed for organizing work in university libraries in this direction. The expected result is an increase in the number of persons trained and an increase in the effectiveness of user training in digital competencies. **Conclusions.** We believe that in order to obtain a high-quality result, it is necessary to provide comprehensive user support. Specialists in information departments in institutions, including university libraries, have the opportunity to do this successfully due to the following advantages: the possession of relevant knowledge and its constant improvement, communication with users who are motivated for successful learning.

Keywords: digital competencies; distance learning; mentor; accessibility; user roadmap

Introduction

At the current stage of the development of society, digitalization is present in all spheres of human life. Digitalization has had a significant impact on the information, educational, and scientific spheres. In addition, hardware and software tools used when working with information are constantly developing and changing. Mastering digital competencies (DC) by users is known to be one of the important tasks of society. Two relevant issues can be highlighted in this direction: organisation of effective learning; updating knowledge and skills in line with technological developments.

The organization of safe training and opportunities for self-development is a priority task in the conditions of the pandemic and martial law in Ukraine (Kvasnyk, Zemliakova, & Balabai, 2022). That is, the main form of learning and self-development is remote, and its main means are remote communication and joint work in the virtual information space. Therefore, safe learning should be ensured when training users in digital competences.

It is important that the distance learning of digital competencies be dominated by the independent work of users, which should be supported by self-motivation regarding their learning, as well as a high level of self-organization.

Digital competencies are a separate group of knowledge and skills that enable information consumers (students, scientists) to solve their own educational and scientific tasks effectively and efficiently, as well as skilfully use the information for the cultural development of the individual. At the Scientific and Technical Library (STL) of NTU "KhPI", we adopt The Digital Competence Framework presented on the EU Science Hub portal (European Commission, n.d.) as the basic digital competences.

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

An important point before starting training is the user's motivation and understanding of the need to master the DC system. To this end, university libraries conduct a significant number of activities to popularize the DC and media literacy among representatives of the academic community. Thus, STL of NTU "KhPI" took part in 6 global scientific events: All Digital Week 2021, International Academic Integrity Day 2021, Open Access Week 2021, Global Media and Information Literacy Week 2021, World Science Day for Peace and Development 2021; International Girls in ICT Day 2022 (Scientific and Technical Library of NTU "KhPI", n.d.).

The next stage is the user's search and selection of courses for training. To ensure the visibility of distance courses for users, it is advisable to carry out the following work:

- Provision of course indexing by search engines;
- Integration of courses into external portals and participation in projects to create distance course platforms;
- Use of current terminology to ensure an effective search for the desired topic.

Thus, taking into account the peculiarities of the organization of self-education and distance learning, we can highlight the main directions for ensuring independent remote mastering of digital competencies:

1. Formation of a communication environment for any type of communication;
2. Formation of information resources;
3. Creation of target distance courses.

There are many tools to implement the direction of communication environment formation. These are not only services implementing one specific function (e-mail, chat, calendar, video conference), but also large complex integrated systems of services. In NTU "KhPI" the corporate communication environment is formed on the basis of Microsoft Office 365 services for higher education institutions (Shokurov, 2021). Microsoft Office 365 is a high-tech enterprise-level service with powerful security features, broad and flexible functionality, and the ability to work from any device and any location on the planet, while using software products familiar to users.

The libraries of higher educational institutions work professionally on the implementation of information resource formation (Chaika, 2020; Brui, Kulyk, & Serbin, 2020). In general, universities' own information resources (open and/or authorized access) are created, which take into account the needs and features of educational programs and areas of scientific activity, and access to external global academic resources is also provided. Among the universities' own information resources, institutional repositories are the most accessible and well-known. According to statistics from the Directory of Open Access Repositories (OpenDOAR), 108 institutional repositories are registered in Ukraine (OpenDOAR, n.d.), whose work is constantly supported by universities.

To create online courses, institutions use learning management systems (LMS), which implement the basic functions necessary for conducting the learning process. Almost all universities have this experience, including NTU "KhPI" (Adashevska, & Kraievska, 2020).

Based on the above, we believe that it is important not only to organize training but also to involve a larger number of users in training. Because in order to obtain a high-quality result, it is necessary to provide comprehensive user support. Each user goes through the following steps according to the "user roadmap" (from identifying the necessary skills to mastering the DC):

1. Understanding the need to master certain skills;
2. Motivation;
3. Availability of training
4. Comfortable learning;
5. Assistance in the learning process;
6. Successful completion of the course;

7. Qualitative application of skills.

The work on step 1 and step 2 of the "user roadmap" can be considered the traditional work of libraries, which is carried out regularly. This article deals with quality support of the online learning process by engaging an assistant and enhancing the ability to find the required distance learning course on one's own.

That is, the goal is to analyse the approaches to organizing work with users that will help:

- Increase the number of those who have correctly identified the necessary digital competencies and are motivated to master them;
- Provide support and accompaniment to the user during training for successful mastery of skills;
- Provide an opportunity to learn independently and safely using remote technologies;
- Determine the tasks of university library specialists to provide comprehensive support at each step of the "user roadmap".

Methods

The study applied empirical methods, namely the collection and analysis of empirical information. Based on this, it should be recognised that the topic of digital competencies is not simple. At each step of the "user roadmap" from understanding the need to master digital competencies to mastering them and applying them, certain difficulties arise. These difficulties are very individual. This confirms communication with users of the Scientific and Technical Library during consultations.

Users who wish to complete distance learning need help and support, as the distance learning process itself is digitally based.

Results and Discussion

A general scheme of the "user roadmap" is presented in Figure 1. Digital and information technologies are developing rapidly, so the steps of the roadmap can be cyclical.

Distance course availability

After the implementation of the distance course, it is important to ensure its accessibility for users. By accessibility, we understand the possibility of finding a course in a virtual information environment and free access to the course content.

The ability to get information about a distance learning course on the internet in any convenient way can be considered visibility. The Google search system is used to monitor the level of visibility of distance courses on the Internet. More than 5,000 results were obtained, namely information about distance learning course portals (search for the exact phrase "portal of distance and mixed learning", "e-learning portal"), which are located on the websites of academic institutions. Each university maintains its own portal of distance courses, the content of which corresponds to its educational and scientific directions. Not all courses are freely available. To search for a specific course, you should work with the search engine on a specific distance courses portal. Regarding courses on the topic of digital competencies, the following distance courses (educational materials) are relevant in universities: informational or academic culture, academic writing, etc. Libraries are actively involved in preparing and conducting these courses. The above courses are used to ensure the principles of academic integrity in the academic environment and provide basic information skills.

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

There are well-known projects on the formation of platforms for distance learning in the world (Coursera, Udemy). Therefore, in addition to the portals of academic institutions, users can access the capabilities of the largest online education platform in Ukraine - Prometheus (Prometheus, n.d.). In partnership with the best lecturers, as well as leading companies and international organizations, Prometheus creates online courses on the most popular topics. Examples of courses in the direction of digital competence from those presented on the portal:

Media literacy: practical skills - The course is devoted to media literacy and the main challenges of the modern world - disinformation and fakes.

Scientific communication in the digital age - the course is intended for anyone who wants to learn more about science communication, its main components, the latest trends and technologies, the secrets of effective work with information, management of research data, and acquire relevant skills.

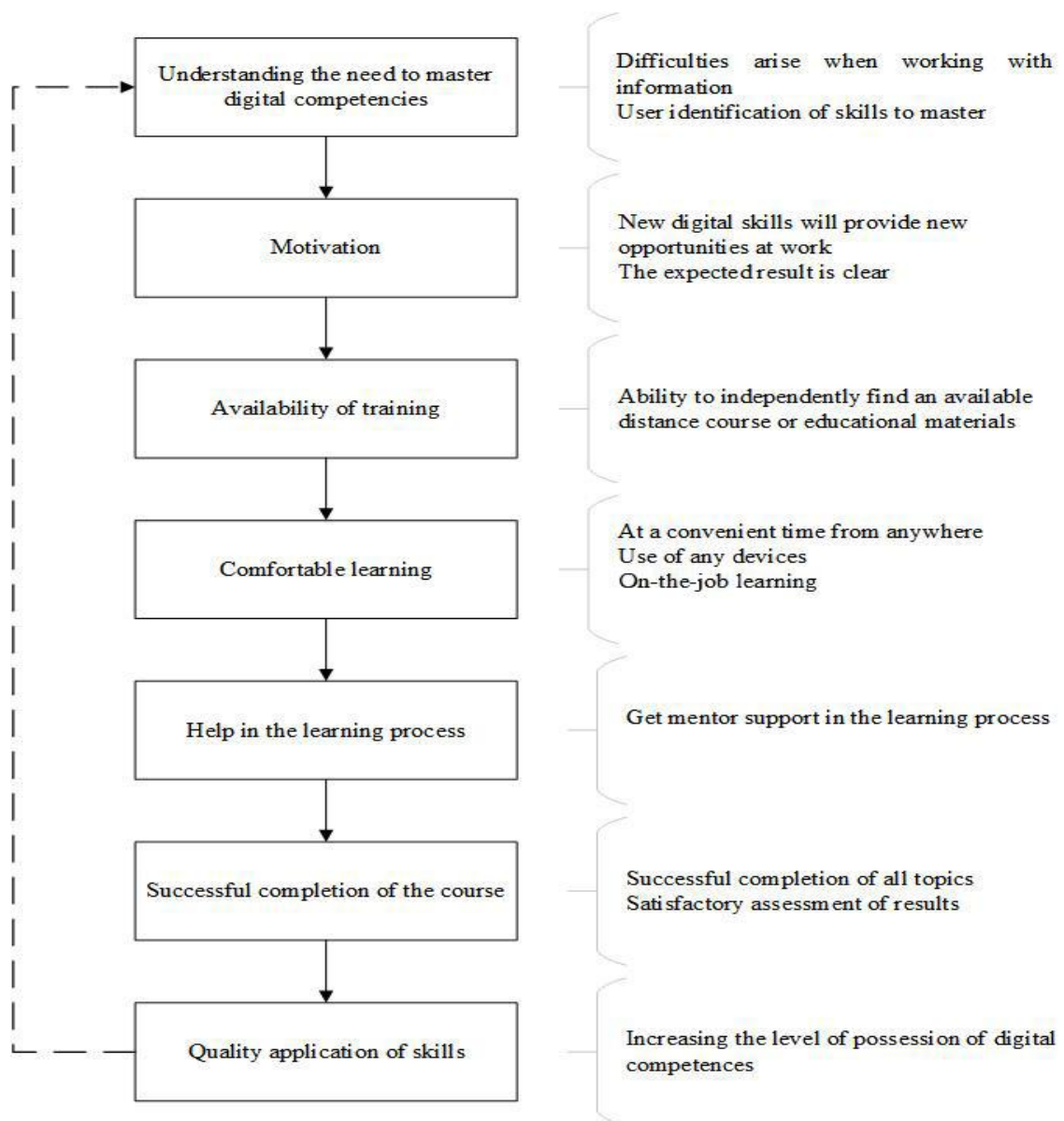


Fig. 1. User roadmap

Attention should be paid to the significant work of the national online platform for the development of digital literacy "Diia. Digital Education" of the Ministry of Digital Transformation of Ukraine (Diia. Tsyfrova Osvita, n.d.). The purpose of the courses is to help everyone effectively and safely use modern digital technologies in work and education, in professional and personal development.

Based on the monitoring, it can be noted that a systematic presentation of courses on digital competencies is not determined in the Ukrainian-language information segment. Identifying the necessary competencies and finding the appropriate courses causes difficulties in practice.

Therefore, we believe that the following should be followed when creating courses:

- Systematic approach to creating courses (digital competencies are considered as a holistic multitude of elements in a set of relationships and connections between them);
- Competency-based approach, which first of all gives a paradigm of understanding the facts (Dolskaia, Holozubov, & Horodyskaia, 2016);
- Practical-oriented approach (the extent to which the content corresponds to consumers' expectations and their actual need);
- Training of mentors and involvement of mentoring support for users;
- Prompt updating of educational content to ensure its relevance;
- Increasing the level of visibility and accessibility of DC due to the use of available opportunities.

In addition to creating one's own courses, it is advisable to recommend freely available courses from leading experts that have already been tested and are available online, and to promote the use of open educational resources.

Since 2016, the "BiblioSynergy" project has been implemented in Ukraine (*Bibliosynerhiia*, n.d.). "BiblioSynergy" is a partnership project of university libraries aimed at creating a professional environment for the communication of like-minded people and the implementation of new practices in the direction of supporting scientific research. The portal is well-known and enjoys the attention of library specialists. In our opinion, it is possible to use the authority and capabilities of the project to promote and ensure the availability of distance courses (any educational materials) in the direction of digital competencies.

Support in training

Support in learning can be provided by a mentor. O. Breslavskiy, the author of the article, has practical experience in mentoring self-created courses "Web Testing Automation on Java" and "Web Testing", presented on the ITVDN (IT Video Developers Network) project portal, which is an online educational resource for IT specialists. Using the capabilities of the ITVDN project makes courses more accessible to users. According to the experience of practical work, mentor involvement contributes to the success of training and increases the percentage of trainees who fully complete the online course. However, there is little reliable information in scholarly articles about the impact of mentoring on the mentor (Leavitt, Nelson, & Cutucache, 2022).

Mentors are a link between a student and a teacher. The methods and approaches of mentors that they use in their work in different institutions may differ (Frecknall, 2019). Mentoring in the electronic environment during higher education has its own characteristics (Tinoco-Giraldo, Torrecilla Sanchez, & García-Peñalvo, 2020).

Many people mistakenly believe that online learning does not have the benefits of traditional face-to-face learning. The mentor provides communication with the students of distance courses. They work with them every day, support them and build trusting relationships. Many trainees look to their mentors as teachers, regardless of the mentor's educational background. The

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

general responsibilities of the mentor include assisting with technological issues of course work; monitoring training results and providing recommendations; encouraging successful study and independent work; interpreting assessment results by the teacher; ensuring communication between the course teacher and the student (Dovzhenko, Nebytova, & Shyshenko, 2021). It should be noted that mentoring is one of the most effective methods of self-development (Malysheva, 2021), that is, both parties benefit from cooperation.

Special attention should be paid to the training of mentors. Since mentoring skills and actions significantly affect the success of those who study, their preparation, especially in scientific communication, is important for effective mentoring (Anderson, Chang, Lee, & Baldwin, 2022).

Mentors must be well versed in the procedures supporting the courses, aware of the technological needs of the trainees. They also help trainees manage their online learning. The general support strategy includes:

- Learning the technology of working with a distance course (demonstration and familiarization with the functionality to be used);
- Mentor should be aware of the success and progress of the training, to help when needed;
- Being in contact with other mentors to form a professional learning community, share good practices and successes, and get ideas for alternative strategies.
- Being available when needed, and establishing rules of communication with students at the beginning of the course;
- Maintaining psychological balance and promoting motivation for successful learning.

Effective mentors make students' learning and progress visible, empowering them to make informed decisions and understand the impact of their choices. By setting initial expectations and modelling the process, trainees gain the ability to meet or exceed goals and set high standards of their own.

Mentors play an important role in helping students learn deeply and meaningfully. The presence of a mentor encourages even the shyest to learn.

In addition, learning in an online course can take place anytime, anywhere, so instructors must be able to use technology and connectivity tools, and work synchronously and asynchronously with trainees to respond promptly to questions. This helps students feel a personal connection to their learning.

Perhaps the greatest benefit that mentors provide to students is an intimate knowledge of their interests, motivations, and strengths. This relationship can guide students in selecting future online courses and learning pathways to help make enrolment decisions at this granular level.

Conclusions

Based on the analysis of approaches to organising user training, the areas of work are determined that not only influence the success of training, but also increase the number of users willing to master digital competencies. The concept of a "user roadmap" is proposed, which includes the user's steps from understanding the need for training to successfully applying the skills.

Mastering digital competences is a pressing task, so finding approaches to effective training for them is also relevant. Specialists in information departments of any institution, including employees of university libraries, have the opportunity to successfully implement the recommendations presented in the article.

The library of the institution of higher education is involved in educational, scientific and cultural, and educational processes at the university. Library employees are well aware of the

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

information needs of their users and try to satisfy them. Thus, they have the opportunity to implement a practically-oriented approach to the definition of topics and meaningful content of distance courses.

For distance courses on digital competence, formed by library staff, a mentor is a new element in the learning process. It is an important factor in successful learning. We consider the planning of mentor training to be a strategic task of the STL of NTU "KhPI". After all, library professionals have the basic knowledge to do so, as they:

- Are information experts;
- Have technological issues and relevant knowledge related to working with information resources;
- Constantly improve and update digital competencies;
- Communicate with users (research and teaching staff, students, and graduate students) who are motivated to study successfully.

Also, each user will have the opportunity to form an individual educational trajectory not only at the level of mastering the disciplines of the educational program but also at the level of mastering digital competencies that are useful in all areas. Thus, the above recommendations will contribute not only to increasing the effectiveness of user learning in digital competencies, but also to improving the overall level of education in other disciplines at the university.

REFERENCES

- Adashevskaya, I. Yu., & Kraievskaya, O. O. (2020). Vprovadzhennia dystantsiinoho navchannia na kafedri heometrychnoho modeliuвання ta kompiuternoї hrafiky NTU " KhPI" pid chas karantynu. Kharkiv, Ukraine: KP " Miska drukarnia". Retrieved from http://repository.kpi.kharkov.ua/bitstream/KhPI-Press/56585/1/Adashevskaya_Vprovadzhennia_dystantsiinoho_2020.pdf (in Ukrainian)
- Anderson, C. B., Chang, S., Lee, H. Y., & Baldwin, C. D. (2022). Identifying effective mentors in scientific communication: A latent profile analysis of mentor beliefs. *Journal of Career Development*, 49(2), 251-268. doi: <https://doi.org/10.1177/0894845320924127> (in English)
- Bibliosynerhiia: pidtrymka naukovykh doslidzen*. (n.d.). Retrieved from <https://bibliosynergy.ula.org.ua/> (in Ukrainian)
- Brui, O. M., Kulyk, Ye. V., & Serbin, O. O. (2020). *Protses yakisnoi informatsiinoi pidtrymky osvity ta doslidzen u bibliotetsi universytetu: rekomendatsii dlia vprovadzhennia modeli*. Kyiv, Ukraine: UBA. Retrieved from <https://ula.org.ua/259-publikaciyi/vidannya/4505-protses-iakisnoi-informatsiinoi-pidtrymky-osvity-ta-doslidzen-u-bibliotetsi-universytetu-rekomendatsii-dlia-vprovadzhennia-modeli> (in Ukrainian)
- Chaika, I. A. (2020, May). Informatsiini resursy naukovoї biblioteky v zabezpechenni dystantsiinoi formy navchannia studentiv. In *Profesiina kompetentnist uchytelia Novoi ukrainskoi shkoly: formuvannia, rozvytok ta udoskonalennia. Materials of the International Scientific and Practical Internet Conference*. Ternopil, Ukraine. (in Ukrainian)
- Diia. Tsyfrova Osvita. (n.d.). Retrieved from <https://osvita.diia.gov.ua/> (in Ukrainian)
- Dolskaia, O. A., Holozubov, A. V., & Horodyskaia, O. N. (2016). *Chelovek v sovremennom myre: na puty k novoi paradyhme obrazovaniya*. Kharkiv, Ukraine: NTU «KhPI». Retrieved from <https://core.ac.uk/download/pdf/162467513.pdf> (in Ukrainian)
- Dovzhenko, T., Nebytova, I., & Shyshenko, V. (2021). Rol mentorstva u profesiinii pidhotovtsi maibutnikh uchyteliv pochatkovoї shkoly. *Teorija ta metodika navchannja ta vihovannja*, 51, 77-87. doi: <https://doi.org/10.34142/23128046.2021.51.08> (in Ukrainian)

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

- European Commission. (n.d.). *The Digital Competence Framework*. Retrieved from <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework> (in English)
- Frecknall, P. (2019). How mentorship happens: Evolving procedures and practices. In *Mentorship in the primary school: Mentorship in action* (pp. 47-61). Retrieved from <https://books.google.com.ua/books?id=RwPFDwAAQBAJ&printsec=frontcover&hl=ru#v=onepage&q&f=false> (in English)
- Kvasnyk, O., Zemliakova, O., & Balabai, A. (2022). The peculiarities of the educational process organization in the conditions of quarantine restrictions in the context of studying the quality of the interaction between its participants. *Theory and Practice of Social Systems management, 1*, 30-47. Retrieved from <http://tipus.khpi.edu.ua/article/view/254302> (in Ukrainian)
- Leavitt, A. S., Nelson, K. L., & Cutucache, C. E. (2022, January 31). The effect of mentoring on undergraduate mentors: A systematic review of the literature. *Frontiers in Education*. doi: <https://doi.org/10.3389/educ.2021.731657> (in English)
- Malysheva, A. A. (2021, March). Mentorstvo yak metod samorozvytku osobystosti u systemi osvity: tradytsii ta novatsii, In *Problemy samorozvytku osobystosti v suchasnomu suspilstvi. Materials of the II International Scientific and Practical Conference*. Yaroslav Mudryi National Law University. Kharkiv, Ukraine. (in Ukrainian)
- OpenDOAR. (n.d.). *OpenDOAR Statistics*. Retrieved from https://v2.sherpa.ac.uk/view/repository_visualisations/1.html (in English)
- Prometheus. (n.d.). *Pro nas*. Retrieved from <https://prometheus.org.ua/about-us/> (in Ukrainian)
- Scientific and Technical Library of NTU "KhPI". (n.d.). *Konferentsii, seminary* [Website]. Retrieved from <http://library.kpi.kharkov.ua/uk/conference> (in Ukrainian)
- Shokurov, O. V. (2021, February). Vykorystannia servisiv Microsoft Office 365 u protsesi navchannia. In *Novitni pedahohichni tekhnolohii u vykladanni mov inozemnym studentam. Materials of the International Scientific and Methodological Seminar, February 25, 2021, Kharkiv, Ukraine*. (in Ukrainian)
- Tinoco-Giraldo, H., Torrecilla Sanchez, E. M., & García-Peñalvo, F. J. (2020). E-mentoring in higher education: A structured literature review and implications for future research. *Sustainability, 12*(11), 4344. doi: <https://doi.org/10.3390/su12114344> (in English)

BRESLAVETS O. Yu.

Національний технічний університет "Харківський політехнічний інститут" (Харків, Україна), e-mail: breslavetsoleksandr@gmail.com, ORCID 0000-0001-8704-0678

HLAVCHEVA Yu. M.

Науково-технічна бібліотека, Національний технічний університет "Харківський політехнічний інститут" (Харків, Україна), e-mail: yuliia.hlavcheva@khpi.edu.ua, ORCID 0000-0001-7991-5411

Визначення підходів до реалізації ефективного навчання цифровим компетентностям

Мета. Проаналізувати підходи до організації навчання користувачів, які можуть бути застосовані в дистанційному навчанні цифровим компетентностям. Опановування користувачами цифрових компетентностей, як відомо, є одним із важливих завдань не лише закладів вищої освіти, а й усього суспільства. Тому ми вважаємо важливим не лише якісно організувати навчання, а й сприяти залученню до навчання більшої кількості користувачів. Для цього необхідно забезпечити комплексний супровід користувача. **Методика.** Застосовано емпіричні методи. В статті розглядається «дорожня карта користувача»

CHANGING ROLES: FROM INFORMATION PROVIDERS TO EDUCATORS

– від ідентифікації користувачем необхідних компетентностей до якісного оволодіння ними. На кожному кроці користувач потребує допомоги. **Результат.** На основі виконаного аналізу розроблено рекомендації для організації роботи в бібліотеках університетів у цьому напрямі. Очікуваний результат – збільшення кількості осіб, що пройшли навчання та підвищення ефективності навчання користувачів цифровим компетентностям. **Висновки.** Вважаємо, що для отримання якісного результату необхідно забезпечити комплексний супровід користувача. Фахівці інформаційних підрозділів установ, у тому числі бібліотек університетів, мають можливість успішно реалізувати ці рекомендації завдяки наступним перевагам: володіння актуальними знаннями та постійне їх вдосконалення, наявність комунікацій з користувачами, які мотивовані на успішне навчання.

Keywords: цифрові компетентності; дистанційне навчання; «дорожня карта користувача»; ментор; доступність

Received: 22.07.2022

Accepted: 28.11.2022