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# THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN LIFELONG LEARNING

Despite the potential benefits of using ICT in lifelong learning, many learners struggle to effectively engage with digital resources and tools, which can limit their access to information and opportunities for learning. Furthermore, there are concerns about the protection of personal information and the potential for data breaches, which can discourage learners from participating in online learning. This problem statement highlights the challenges that may be encountered when using ICT in lifelong learning, such as the lack of digital literacy, privacy and security concerns, and the need for ongoing support and maintenance. It also acknowledges that ICT can offer many benefits, such as increased access to information and personalized learning experiences, there are also challenges that need to be addressed in order to ensure that learners can fully engage with and benefit from digital resources and tools.

Analysis of recent research and publications in the field of information and communication technologies (ICT) in lifelong learning have focused on a variety of topics, including the use of ICT to support self-directed learning that have shown that ICT can be used to support self-directed learning, which can be beneficial for adult learners who are seeking to acquire new skills and knowledge outside of formal educational settings (Kleiman, 2019). Other researchers attach great importance to the use of ICT to support blended learning, which combines online and face-to-face instruction, and has been shown to be effective in promoting student engagement and learning outcomes (Sánchez-Sánchez & García-Peñalvo, 2020). The use of ICT to support collaborative learning is also researched, and has been shown to be effective in promoting student engagement and learning outcomes (Kirschner, Strijbos, Kreijns, & Beers, 2004). Scientists explore the use of ICT to support personalized learning, which tailors instruction to individual students' needs, and has been shown to be effective in promoting student engagement and learning outcomes (Wang, Chen, & Liang, 2019). The use of ICT to support lifelong learning is becoming increasingly important as the nature of work and the economy continues to change (European Commission, 2018).

The purpose of the theses is to analyze principles of lifelong learning and challenges of using ICT in it and investigate how digital technologies can be used in lifelong learning in terms of digital transformation.

The concept of lifelong learning has been studied and defined by various researchers in the fields of education, psychology, and sociology. Here is definition of lifelong learning provided by

European Commission: "Lifelong learning is the process of keeping the knowledge, skills, and abilities of individuals up-to-date throughout their lives, in order to adapt to the changing demands of the labor market, to changing personal circumstances, and to changing social and economic conditions." (European Commission, 2000). UNESCO identifies the notion as: "Lifelong learning is the process of acquiring and applying knowledge, skills, attitudes, and values throughout life, in a wide range of formal and non-formal learning contexts, in order to improve one's quality of life and to participate fully in society." (UNESCO, 2002). European Parliament highlights: "Lifelong learning is the process of acquiring and updating knowledge, skills, and competencies throughout the lifespan, in order to meet changing personal and professional needs, as well as to participate fully in society." (European Parliament, 2018). These definitions illustrate some of the common themes in the concept of lifelong learning, including the idea that it is a continuous and ongoing process, that it can occur in a variety of contexts, and that it is motivated by the desire to improve oneself and to participate fully in society.

The author has formulated the principles of lifelong learning that are represented in Figure 1.

Lifelong learning refers to the continuous process and it is not limited to formal education and can occur at any stage of life. At the same time, learning is self-directed that means ndividuals take responsibility for their own learning and set their own learning goals. We also stress that learning is adaptive as it is responsive to changes in an individual's life or in the world around them. Learning is goal-oriented because it is focused on achieving specific outcomes or objectives. Learning is socially embedded - one of the main principle as it takes place in a social context and is influenced by the experiences and perspectives of others.
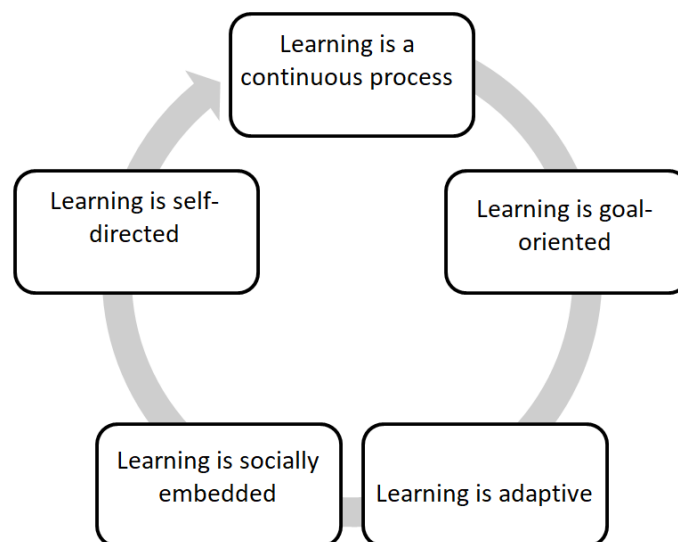


**Fig. 1: Principles of lifelong learning**
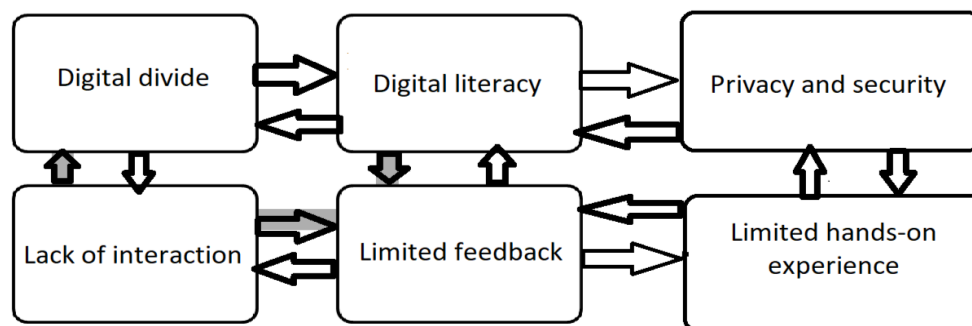
*Source: compiled by the author*

**Fig. 2: Challenges of ICT in lifelong learning**

*Source: compiled by the author*

There are several challenges associated with using information and communication technologies in lifelong learning that was analyzed by author and pictured in Figure 2.

The challenge of digital divide concerns that not everyone has access to the same level of technology, which can create disparities in access to information and opportunities for learning. Digital literacy corresponds that many individuals lack the necessary skills to effectively use ICT for learning, which can limit their ability to access and engage with digital resources. We also clarify the challenge of privacy and security which is connected with the use of ICT in learning raises concerns about the protection of personal information and the potential for data breaches.

Lack of interaction stresses that online learning platforms lack the interaction and personal touch of traditional classroom environments. Limited hands-on experience is another challenge that describes by online learning often lacks hands-on experience which is important in certain field such as engineering, medical and other technical fields. We also emphasize limited feedback as online learning often lacks the personal feedback, which is an essential part of learning process.

Lifelong learning and digital transformation are closely linked as the digital revolution has transformed the way we learn and access information. There are many researchers who study the intersection of lifelong learning and digital transformation. Here are a few examples, along with references to their work: Dr. Sanna Järvelä, Professor of Learning Analytics at the Open University in the UK, has studied the use of digital technologies in lifelong learning and the impact of these technologies on learning outcomes. (Järvelä, S., & Järvenoja, H. (2015). Digitalization and lifelong learning. Journal of lifelong learning, 2(1), 1-11.); Dr. Paul Kirschner, Professor of Educational Psychology at the Open University of the Netherlands, has studied the use of technology in education and the implications of digital transformation for lifelong learning. (Kirschner, P. A., & de Lange, J. (2018). The myth of the digital native: Reflections on the digital divide and the need for lifelong learning. Journal of Computer Assisted Learning, 34(5), 363-378.); Dr. Anna-Maria Osula, Assistant

Professor of Digital Education at Tallinn University in Estonia, has studied the use of digital technologies in lifelong learning and the impact of digitalization on education. (Osula, A.-M., & Vadi, M. (2019). Digitalization and lifelong learning: The role of digital technologies in lifelong learning. Journal of lifelong learning, 6(1), 1-15.). These researchers have contributed to the understanding of the intersection between lifelong learning and digital transformation, and their work can provide valuable insights and perspectives on the topic.

Information and communication technologies have played a significant role in promoting lifelong learning by making learning more accessible, flexible, and personalized. The author charts how digital technologies are being used in lifelong learning include in Table 1.

In summary, the digital transformation has also made it possible for learners to access a wide range of resources, such as online libraries, databases, and educational videos, and to collaborate and communicate with others in online learning communities.

**Table 1 – The use of ICT in lifelong learning**

| Digital technologies | Using in lifelong learning |
|---|---|
| 1. Online learning platforms | These platforms, such as Coursera and Udemy, provide access to a wide range of online courses and educational resources, making it easy for individuals to learn at their own pace and on their own schedule. |
| 2. Mobile learning | The ubiquity of smartphones and tablets has made it possible for individuals to access learning materials and resources on-the-go, which is particularly useful for busy individuals or those in remote locations. |
| 3. Virtual and augmented reality | These technologies are increasingly being used to create immersive learning experiences, such as virtual labs and simulations, which can help learners gain hands-on experience in a safe and controlled environment. |
| 4. Artificial Intelligence | AI is being used in many areas of education, such as personalized learning, adaptive assessment, and tutoring systems. |
| 5. Social learning | Digital technologies, such as online forums, social networks, and collaboration tools, have made it possible for individuals to connect and learn from others in online learning communities. |

*Source: compiled by the author*

Moreover, the use of ICT in the workplace, such as automation and artificial intelligence, has made it essential for individuals to continuously update their skills to remain competitive in the job market. This has increased the importance of lifelong learning in today's society as digital technologies have played a major role in promoting lifelong learning by making learning more accessible, flexible, and personalized, and by increasing the need for individuals to continuously update their skills.

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