Metamorphosis: Unveiling the Evolution of Learning and Teaching in Digital Literacy Classes

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Abstract: The relevance of this research lies in the rapid integration of students into digital formats as a result of the digital transformation of the educational space. This integration has had an impact on students' information behaviour as well as on educators. To address this situation, peer-to-peer interaction is proposed as one possible solution. The research was conducted from 2019-2023 as part of an elective course called 'The ABC of E-Learning: Choosing, Learning, Creating'. The aim was to analyze the information behaviour of 307 participants, first-year bachelor's degree students from Tyumen State University in both full-time and part-time programs. The study revealed that students demonstrated the highest levels of information behaviour in terms of 'mastering online courses' and 'searching for useful and interesting resources' throughout the course. However, their behaviour in terms of 'going beyond the scope of educational content' and 'choosing different sources of information' was less consistent. The results indicate that students find the acquisition of new online services and the independent search for internet resources for educational and professional activities to be particularly interesting. They also enjoyed participating in peer-to-peer interactions and sharing their findings in the classroom. To change the nature of interaction with educational content, the strategy suggests transitioning from sequentially mastering content to personally and meaningfully transforming it using digital tools. The primary role of a modern educator in a classroom of digitally advanced students is to facilitate the transformation of information into knowledge, foster the development of creative problem-solving skills, and encourage the generation of original ideas and alternatives.

1 INTRODUCTION

Digital literacy and ICT competencies have become essential skills for university students in both academic and professional settings due to the digital transformation of education. The preparation of students in various fields now necessitates competencies in digital communication and collaboration. These competencies empower individuals to effectively utilize digital tools to interact, accomplish objectives, adapt to uncertain conditions, manage information and data, and think creatively in a digital environment.

The European framework for digital competences for citizens (DigComp) aligns closely with the methodology of the Russian Ministry of Economic Development. This framework comprises five key areas of digital competences: information literacy, communication and collaboration, creation of digital content, cybersecurity, and problem-solving in the

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digital realm. Notably, digital skills cannot be categorized strictly as hard or soft skills, as they are contingent upon specific tasks, individual traits, and the external environment (Chernobrovkina, 2014).

Digital competences are recognized as integral to the formation of meta-competencies, alongside self-regulated self-learning, project management skills, creative and critical thinking, and adaptability. In the current socio-historical context, there is a growing demand for graduates who possess proficient digital technology skills, prompting universities to incorporate courses focused on developing digital competences into their educational programs. At institutions such as Tyumen State University, The State Agrarian University of the Northern Trans-Urals, and Kuban State University, training in the use of electronic resources commences from the first year.

A notable example of a course offered at Tyumen State University is 'The ABC of E-Learning: Choosing, Learning, Creating', which is an elective course open to students from all disciplines. This course aims to expand students' digital competences in their learning journey and future academic and professional endeavors.

The objective of this research is to analyze the information behaviour of students enrolled in this elective course between the years 2019 and 2023.

2 RESEARCH CONTENT

The research was conducted from 2019-2023 as part of the elective course 'E-Learning: Choosing, Learning, Creating' at Tyumen State University, with the participation of 307 first-year bachelor students in both full-time and part-time programs.

Throughout the study, we explored the specific approaches employed by students when utilizing electronic resources, their perception of information, and their readiness to engage in communication with their instructors. To gather feedback, a self-reflection survey was administered using Google Forms following hands-on sessions.

To analyze the data gathered, quantitative analysis methods were employed. This included tallying the number of responses as well as employing descriptive statistics.

3 RESEARCH RESULTS

The objective of this elective course was to enhance students' digital skills in utilizing electronic and blended learning technologies, as well as designing, developing, and implementing electronic educational resources in the instructional process.

The course aimed to achieve the following goals:

1) Provide an understanding of blended learning technologies.

2) Familiarize students with various types of electronic educational resources and their functions.

3) Develop skills and basic proficiency in utilizing programs and services for creating multimedia and interactive electronic learning content.

The course curriculum covered topics such as *E-Learning Trends, Digitalization of Education, E-Learning and Blended Learning Models, Pedagogical Design in Online Learning, Organization of Instructional Process, Independent Learning, Collaborative Learning with Digital Technologies, Assessment Tools in E-Learning, Electronic Learning Management Systems, and Online Platforms for Content Hosting. It also included lessons on Tools for Creating Modern Electronic Educational Resources, Webinars - Online Lessons and Their Construction,* and *Must-Have Technologies for the Future Educator: E-Learning Technologies*. Furthermore, participants were expected to create an original database of electronic educational resources using the learned online services and programs.

Instructors traditionally have several key roles in the instructional process, which include setting goals and objectives, delivering knowledge and experience, creating motivating incentives, organizing activities that encourage student interaction, and monitoring the learning process (Sorokina et al., 2022; Yakovleva & Kulikova, 2022).

When instructors incorporate electronic learning into their teaching practices, they have additional responsibilities such as:

1. Creating relevant electronic educational content.
2. Keeping up with new electronic resources related to their subject matter.
3. Utilizing different organizational forms, such as introductory lectures for online courses and video lectures on complex topics.
4. Learning new pedagogical techniques, including organizing interactive group work online.
5. Providing both online and offline consultation to students.

6. Participating in video conferences and webinars.

7. Adapting to a flexible schedule that considers both the academic timetable and student preferences (Semenovskikh et al., 2022; Shlyapina & Semenovskikh, 2015).

According to Andreev's research on online or blended learning, there are several key functions that a teacher serves (Andreev, 1999). These functions are categorized and presented in Table 1, which highlights the most prevalent ones.

Table 1: Teachers' roles and functions in e-learning.

Teachers's roles in e-learning	Functions performed
Development phase of an e-learning resource	
Teacher	Responsible for the development of the content of the course
Instructional Designer	Develops the instructional part of the course, taking into account the unique aspects of e-learning and distance learning. This includes determining methods for presenting educational material, implementing appropriate teaching techniques, designing various learning tasks and exercises, creating discussion questions, and organizing interactions between participants in the learning process
Current Teaching Process	
Facilitator	Assists students in identifying and implementing their personalized educational trajectory, acting as a curator in the realm of distance education
Tutor	Delivers interactive instructional courses, while engaging with students throughout the course materials and offering consultations
Current, Intermediate, and Final Assessment	
Assessment Expert:	Conducts exams, evaluations, and grading of coursework, tests, and other assessment tasks

The elective course called 'The ABC of E-Learning: Choosing, Learning, Creating' has been taught since 2019. Each year, students are becoming more proficient in their understanding of online services and platforms, as well as gaining proficiency in using services and programs for creating electronic content.

For instance, during the first year of the course, it took 4 academic hours to become skilled in using one online resource. This involved spending 2 hours introducing students to the service, its interface, and demonstrating its capabilities, followed by 2 hours of practical exercises.

Currently, in 2023, the amount of instructional information required to master these resources has significantly reduced, taking approximately two or even three times less time. Please refer to Figure 1 for a visual representation.

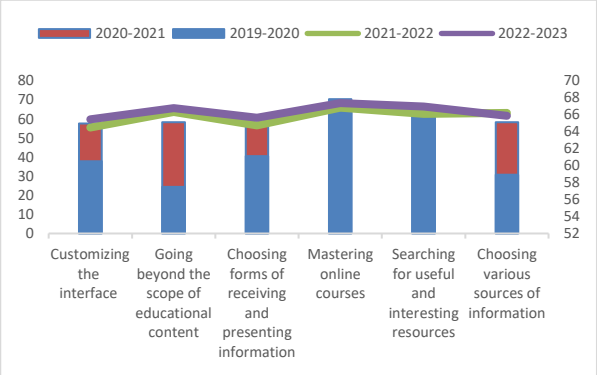

Figure 1: Dynamics of indicators of information behaviour among students enrolled in an elective course (average scores). set to justify.

The indicators "mastering online courses" and "searching for useful and interesting resources" received the highest scores among students throughout the course. On the other hand, the indicators related to information behaviour, such as "customizing the interface for myself" and "choosing forms of receiving and presenting information," showed smaller changes. The indicators "going beyond the scope of educational content" and "choosing various sources of information" were found to be less consistent.

From the results, it is clear that students find value in acquiring new online services and independently searching for internet resources to support their educational and professional activities. Additionally, it is worth mentioning that course participants willingly shared their discoveries in the classroom. These activities significantly contributed to their educational motivation and were easily accomplished by the students.

4 DISCUSSIONS

Contemporary students nowadays not only receive instructions from teachers but also actively participate in the usage of digital tools. They sign up for these services and intuitively navigate through them, sometimes even producing a trial product within just thirty minutes of the class starting. These students already come equipped with basic ICT competencies when they enter digital courses, allowing them to quickly find information they need. The idea of the 'new learner' has been extensively studied. V.N. Kutrunov, for example, identifies several key changes in learning. Firstly, there's the concept of 'informational surfing' - the constant and effortless exploration of information from early childhood. Instead of relying on books, students can instantly access information through mobile devices and the internet. This trend gradually reduces the importance of slower processes like reading books. Secondly, there's 'clip thinking' - the ability to quickly grasp information without considering the connections between different pieces of knowledge. This is characterized by fragmentary thinking, rapid information processing, and a lack of coherence in perception. Working with vast amounts of information reinforces this mode of thinking. These changes are brought about by new technologies (Kutrunov, 2017).

As the number of students adept in digital technology continues to grow, it raises questions about the role and function of teachers in the educational process. In such circumstances, a peer-to-peer or mutual learning approach seems appropriate. J.H. Nieminen et al., in their work on e-learning, highlight the significance of collaborative activities and cooperative learning. They argue that students should take initiative, contribute to cooperation, and exhibit independence in their actions (Nieminen et al., 2011). M. Hewson also describes three different behavioural positions for learners - individual, trusted, and collective (Hewson et al., 2010). Students can act individually by making decisions on their own, act as representatives of the teacher by following assignments and recommendations, or act on behalf of a community, such as in group work or collaborative tasks.

We have identified a fourth type of information behaviour, i.e., expertise, where students possess information and can present it to participants in the educational process (using chatbots, performing tasks with the help of neural networks).

If we talk about mutual learning, we imply a change in the requirements for the teacher. P. Fernández-Arias et al. note new requirements for the teacher, i.e., digital literacy, emotional intelligence, and cognitive flexibility" (Fernández-Arias et al., 2021). According to M. Ally (Ally, 2019), digital competencies are important, as well as the use of innovative technologies (artificial intelligence, blockchain, virtual and augmented reality, big data), and knowledge of programming languages. The future of the education field is inseparable from the digital ecosystem, creating new challenges (Sarnok et al., 2019, Ilic , 2020).

We believe that the strategy for changing the nature of interaction with educational content can develop in the direction of transitioning from sequential mastery of educational content to its personal and meaningful transformation based on the use of digital tools.

A study conducted by N.M. Shlenskaya et al. on the behaviour of students in online learning showed correlations between the level of digital literacy, attitude towards online learning, and the degree of student's activity in the digital environment (Shlenskaya et al., 2021).

Thus, the strategy for developing information behaviour involves transitioning from the use of digital tools and technologies for information search and processing, storage, and transmission, collaborative learning, organizing joint activities within a community, learning through creativity and digital self-realization to curating educational content, digital self-management, open digital research practice, and digital self-presentation. For instance, A. Forkosh Baruch and R. Gadot (Forkosh et al., 2021) conducted a study on teaching future educators content curation through the creation of a joint 'knowledge exhibition' in the process of studying an academic discipline. As a result, it was proven that content curation significantly transforms learning, stimulating the development of metacognitive and social skills.

The functions of a modern teacher are significantly changing and expanding, since digitalization fundamentally alters the educational landscape and transforms traditional models of organizing the educational process (Shlyapina, 2022). We believe that the main function of a modern educator in a classroom of digitally advanced students is to help learners transform information into knowledge, acquire the ability to set and solve creative tasks that require not only choice but the creation of their own versions and options.

5 CONCLUSIONS

It is necessary to transition from the traditional, lecture-based model of the educational process to a personalized approach focused on outcomes.

On an elective course, it is recommended to enhance and stimulate:

- Digital competencies that correspond to the high information and communication potential of the digital environment and meet the individual needs of learners.

- Professional values such as collaboration, creativity, intellectualization, and self-development.

- Professional thinking (systemic, critical, and creative), which allows for a deep and wide understanding, analysis, problem solving, and evaluation of issues in the context of interdisciplinary connections, relying on the collaborative actions of other individuals or artificial intelligence.

- Collaborative activities among learners to solve set tasks through organizing network communication, distributed network activities, mutual control, and assessment based on software and hardware tools.

- Active independent activities among learners, activating mechanisms of self-organization and self-management, and utilizing the educational and reflective potential of the digital learning environment.

- Self-education.

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