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Web-based applications in higher education: revolutionising language learning in the digital age

Aplicaciones basadas en la web en la educación superior: Revolucionando el aprendizaje de idiomas en la era digital

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Abstract

This research article aimed to examine the utilisation of web applications in higher education, specifically focusing on their presentation and usage. Methodology: a mixed approach was used in the study. The results showed that by analysing how these applications are used and discussing user perspectives, the study shed light on the interplay between technical functionality and social engagement in information and communication technologies. Students in higher education view educational web applications as supplementary resources, utilising them for tasks such as translation and pronunciation practice. It can be concluded that the active and productive use of educational mobile applications by students in Ukraine has notably increased, particularly in the context of war. The key benefits reported by students included the accessibility and convenience of

Resumen

Este artículo de investigación tuvo como objetivo examinar la utilización de aplicaciones web en la educación superior, enfocándose específicamente en su presentación y uso. Metodología: se utilizó un enfoque mixto en el estudio. Los resultados mostraron que al analizar cómo se utilizan estas aplicaciones y discutir las perspectivas de los usuarios, el estudio arrojó luz sobre la interacción entre la funcionalidad técnica y la participación social en tecnologías de la información y la comunicación. Los estudiantes de educación superior ven las aplicaciones educativas web como recursos complementarios, utilizándolas para tareas como prácticas de traducción y pronunciación. Se puede concluir que el uso activo y productivo de aplicaciones educativas móviles por parte de los estudiantes en Ucrania ha aumentado notablemente, especialmente en el contexto de la guerra. Los beneficios clave

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web-based educational tools. These applications serve as both learning aids and motivational tools, addressing challenges such as remote learning and limited English-language materials. The widespread use of web applications during times of war has proven instrumental in maintaining educational access and quality in Ukraine.

Keywords: application, user, technical and social aspect, information and communication technologies, social and learning context.

reportados por los estudiantes incluyeron la accesibilidad y conveniencia de las herramientas educativas basadas en la web. Estas aplicaciones sirven tanto como ayudas de aprendizaje como herramientas motivacionales, abordando desafíos como el aprendizaje remoto y la disponibilidad limitada de materiales en inglés. El uso generalizado de aplicaciones web durante épocas de guerra ha demostrado ser fundamental para mantener el acceso y la calidad educativa en Ucrania.

Palabras clave: aplicación, usuario, aspecto técnico y social, tecnologías de la información y comunicación, contexto social y educativo.

Introduction

The spread of information and communication technologies (ICTs) in higher education has led to significant transformations. The aim of ICT in higher education has been to improve the outcomes and performance of teachers and students (Muftah, 2023). The popularity of web-based applications lies in the fact that they can be accessed via smartphones, hence the growing number of users. While information and communication technologies play an important role in learning, it is still common to see that the mobile devices through which students use web applications are subject to prejudice from certain members of the education system (Gonçalves et al., 2022). Although new education is actively introducing ICTs into learning, with mobile devices as the main tool, the internal rules and regulations of some educational institutions are very unfavourable for the effective implementation of digital technologies. These institutions are characterised by an environment where the carrying and use of mobile phones is prohibited (Chen et al., 2019). However, in relation to higher education institutions and among students, there is an active use of applications such as Learning English and Duo linguo, Tubidy MP3 Music, and Videmate outside the classroom on smartphones (Garvasiuk & Namestiuk, 2022). From this perspective, the problematic of the presented work is the question of how students learn English in their own cultural context and how they use web applications?

Web-based applications in the context of higher education have indeed changed and transformed the way foreign languages are learnt in the digital age. Traditional approaches to language learning, such as classroom or one-to-one tuition, are still important, but new technologies provide students with more opportunities for self-directed learning and language practice. In addition, in the context of the war in Ukraine, active hostilities, shelling, and military operations have damaged and destroyed infrastructures, including schools and universities (Sherman et al., 2022). Most of the affected institutions (both public and private) were left without basic educational tools and staff. Libraries and laboratories in most of these universities have also been destroyed. So, what can be done to improve the level of foreign language teaching and learning in a time of war? In light of this question, two working hypotheses have been put forward: the use of web-based applications is a lifesaver for Ukrainian education in times of war; the use of web-based applications is linked to the social, cultural, and technological context of higher education institutions and students.

In this context a specific research question were proposed: How do students in Ukrainian higher education institutions utilise web-based applications for learning English in the context of the ongoing war in Ukraine?

Theoretical framework or literature review

Despite the valuable insights provided by previous studies on the impact of web-based applications in language learning, there are several limitations that need to be addressed. Firstly, the methodology used in some described studies are limited in scope and not clearly defined how web-based applications impact language learning. Thus, one of the main ways that web-based applications impact language learning is through access to a variety of online resources and self-study programmes. Students can use these resources to learn grammar, words, and phrases, as well as to gain skills in pronunciation and comprehension. Web-based

applications also provide opportunities to interact with other students and teachers from different countries, which helps to develop language skills and cultural understanding. The generalisability of results from previous studies are limited due to the specific contexts in which they were conducted. Factors such as the cultural background of participants, the language being studied, and the specific web-based applications being used restricted the results and limited their applicability to different settings. So, in order to develop the presented research approach, the paper focuses on theories of representation, on the one hand, and theoretical models that study the social integration of web applications and (mobile) technical devices in education, on the other. According to Maciej (2023), three theoretical models shed light on the social "attachment" of society to technical devices: the diffusion model, the broadcast model, and the circulation model. To these three models, we should add the sociology of use, which we consider indispensable, especially in the context of the war in Ukraine.

Social studies of ICT use have gone through a series of assessments and perspectives, partly updated by the emergence of modern digital media (mobile internet, social networks, mobile applications, etc.). Weber, Dettmer, Schurz & Thelen (2022) describe the contributions and limitations of sociological approaches to ICT use in education.

Studies conducted within the sociological perspective reveal gaps between the use envisaged by the creators of a sociotechnical device and the actual use by users (Dahal, 2022). Related research analyses the relationship between technical innovation and social innovation, the interaction between humans and technology (Vandebroeck, 2022). The author takes into account both social and technical use of information and communication technologies.

For many years, scholars have been trying to comprehend the diversity of processes associated with the social appropriation of ICTs, while avoiding any critical logic. Without fitting into any of the different models, we consider the circulation model to be appropriate and important for studying how students represent themselves and use educational mobile and web-based applications for learning a foreign language. Legemaate, Grol, Huisman, Oolbekkink-Marchand & Nieuwenhuis (2022) appeal to the notion of a socio-technical frame of reference, which is defined as the union of a framework of functioning and a framework of use. For the authors, the central question is how does it work and how is it used?

According to Rosa, Villanueva, Miguel & Quinto (2022), a technical device cannot be studied and understood separately from the social context in which it is integrated. Ultimately, the socio-technical approach to technical devices simultaneously encompasses four dimensions: the structural characteristics of platforms, user use, and the trajectory and functions of the device itself (Krymets, 2022).

The notion of cognitive, individual, and collective representations plays a crucial role in the design, acceptance, or rejection of a sociotechnical device. Indeed, the idea of social representations is a way of interpreting the world and everyday reality in the form of social knowledge, which an individual constructs more or less consciously based on subjective considerations (Dobrovolska et al., 2021).

In his work, Sofilkanych (2022) demonstrates the two processes that make up social representations: objectification and attachment. Objectification is based on cultural and normative criteria. The attachment is related to the institution. The objectification itself is formed in such a way that it makes it possible to appropriate and integrate knowledge about a particular subject. For students, objectification is a tried-and-tested activity, as they a priori belong to cultural groups and are exposed to institutional norms and standards during their studies. As for attachment, it encompasses the incorporation and social rooting of representation in the subject's value system (Jalilbayli, 2022a).

In the research presented here, objectification involves the examination of cultural and normative criteria, while embedding highlights the way in which educational web or mobile applications are given meaning on an individual level. In this respect, the processes described are inextricably linked to mediation.

The concept of mediation is more complex than one might imagine. It goes beyond everyday exchanges of information (Afrilyasanti, Basthomi & Zen, 2022). The act of mediation necessarily encompasses the following three dimensions: technical substrate (what devices?), political and professional procedures (which actors, which professions), and cultural and social meaning (what values, what principles?).
As for the term "web-based learning device", it is considered in this paper as a technical set of practices, a way of thinking (habitus) that

facilitates learning (Damayanto et al., 2022). The digital mediation of web-based devices rather focuses on a process that results in learning, but also in the dissemination of knowledge. It is also seen as a means of mobilising and responding to the cognitive needs of any society, taking into account the social and cultural factors of that society (Jalilbayli, 2022b).

The digital knowledge mediation approach raises the issue of the loss of individual autonomy. Therefore, the approach involves going beyond the mere transfer of information and considering the way in which links are made between information needs and information use in the transformation of information into knowledge (Puebla et al., 2022).

Despite the fact that the introduction and use of web and mobile applications in foreign language learning is part of the usage, they have received very little attention in the educational environment. Among students, digital educational applications are perceived as mere learning tools rather than as hypothetical mainstream learning tool. This indicates that digital learning cannot automatically "win" over traditional learning (Jie & Sunze, 2023).

The use of technology in non-educational environments offers opportunities for language learning in different situations (Alrikabi et al., 2022). A study conducted by Alenezi (2023) on students' perceptions of web-based applications showed that the use of technology affects the quality of learning. Learning seems to be more interesting and creative. This is particularly true of mobile technologies, which provide portability, social interactivity, individuality, sensitivity, and contextual connectivity (Martín-Sómer et al., 2021). It is visible that the lack of attention to the potential loss of individual autonomy in the digital knowledge mediation approach is a critical limitation. Understanding how technology can empower learners while also recognising the risks of dependence on digital tools is essential for effective language learning strategies. While previous research has laid a foundation for understanding the impact of web-based applications in language learning, there is a need for more comprehensive and interdisciplinary study that addresses the limitations mentioned above. By addressing these limitations, it is possible providing a more nuanced and holistic understanding of how web-based applications can enhance language learning outcomes.

Consequently, a review of the scientific literature on the use of web-based applications for foreign language learning suggests that there is a relationship between the growing use of portable devices such as smartphones, MP3 players, and personal digital assistants. The next finding relates to the importance of web-based applications in foreign language learning. It is not only about the ubiquitous nature of learning but also about the various functionalities of the software, such as automatic speech recognition and mobile social networks. The third and final aspect concerns the attributes of the technical device. This is how we see the use of a foreign language learning app. Students report improved language proficiency, especially in vocabulary, reading, writing, grammar, and translation exercises, thanks to the use of web-based applications on mobile devices.

In summary, the review of previous studies highlights the impact of web-based applications on language learning, focusing on access to online resources, interaction with other students and teachers, and cultural understanding. However, limitations in methodology and generalisability of results suggest the need for a more comprehensive and interdisciplinary approach. The current study aims to address these limitations by focusing on the socio-technical framework and social representations of web-based applications in language learning. By integrating theories of representation and models of technology use in education, the study seeks to enhance understanding of how students engage with and benefit from web-based language learning applications. Ultimately, the study aims to contribute to the broader conversation on the role of technology in language learning and explore the potential for empowering learners while also recognizing the risks of dependence on digital tools. Through a nuanced and holistic examination of the impact of web-based applications, the current study aims to provide valuable insights for improving language learning outcomes and informing future research in the field.

Methodology

The study used a mixed approach that combined quantitative and qualitative methods. Data triangulation, a key aspect of the mixed approach, allowed diverse perspectives on the study topic to be gathered and increased the reliability and validity of the findings.

A survey was conducted among 150 English students from National Polissia and National VO

Sukhomlynskyi Mykolaiv universities between September 7 and December 30, 2023. The questionnaire, which contained closed and open questions, was distributed online and focused on perceptions and use of web applications on smartphones.

In-depth interviews were conducted with 20 students selected through purposive sampling. This method was used to ensure that participants had experience using digital educational web applications for English language learning. The interviews were based on mutual trust and were recorded for later transcription and analysis.

To minimize bias in participant selection, specific criteria were defined. Participants had to be English learners who:

They regularly used digital educational web applications.

They had experience with different types of digital educational web applications.

They were willing to share their experiences and opinions on using web applications.

The interviews were transcribed and managed using Advene software, and lexical and semantic analysis was performed using NooJ software. The survey data were analyzed using descriptive statistical techniques.

Limitations of the study

It is important to note that the sample size in this study was relatively small, with only 150 students participating in the questionnaire survey and 20 students participating in the in-depth interviews. This limited sample size may affect the generalizability of the findings to a larger population.

Additionally, the use of purposive sampling may introduce bias into the study, as participants were selected based on specific criteria.

Analysis of data

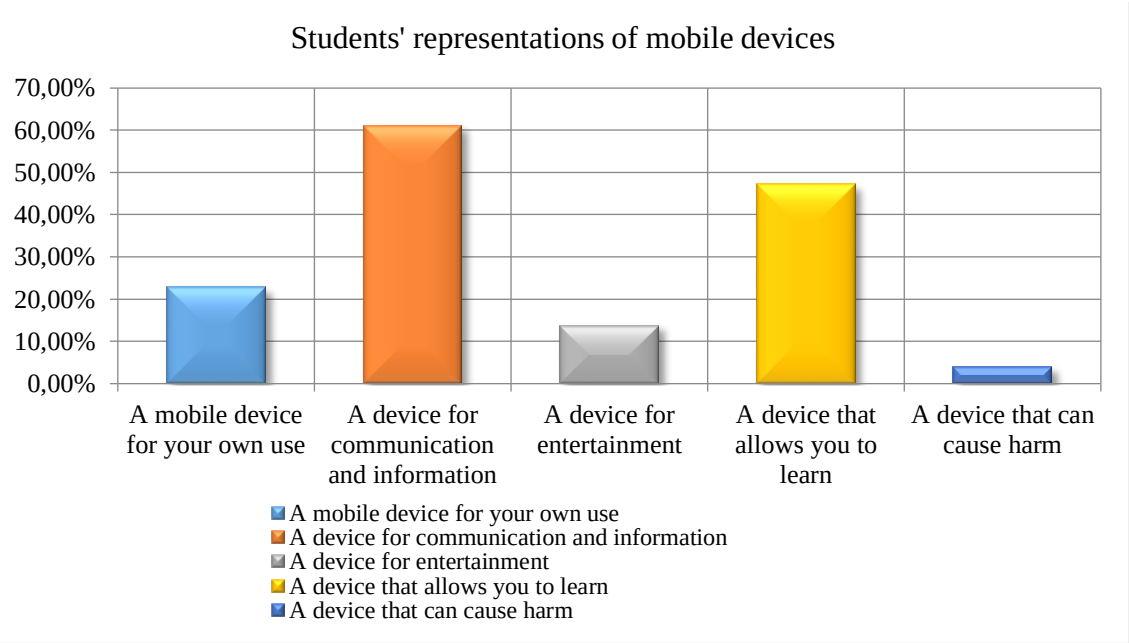
Analysis of the survey data was carried out using descriptive statistical techniques, such as frequency of responses, mean, median and standard deviation. Data from the in-depth interviews were analyzed using a content analysis approach, which allowed for the identification and understanding of emerging themes and patterns in participants' responses.

**Overall, the mixed methodology used in this study provided valuable information about the perceptions and use of web applications in learning

Results and discussion

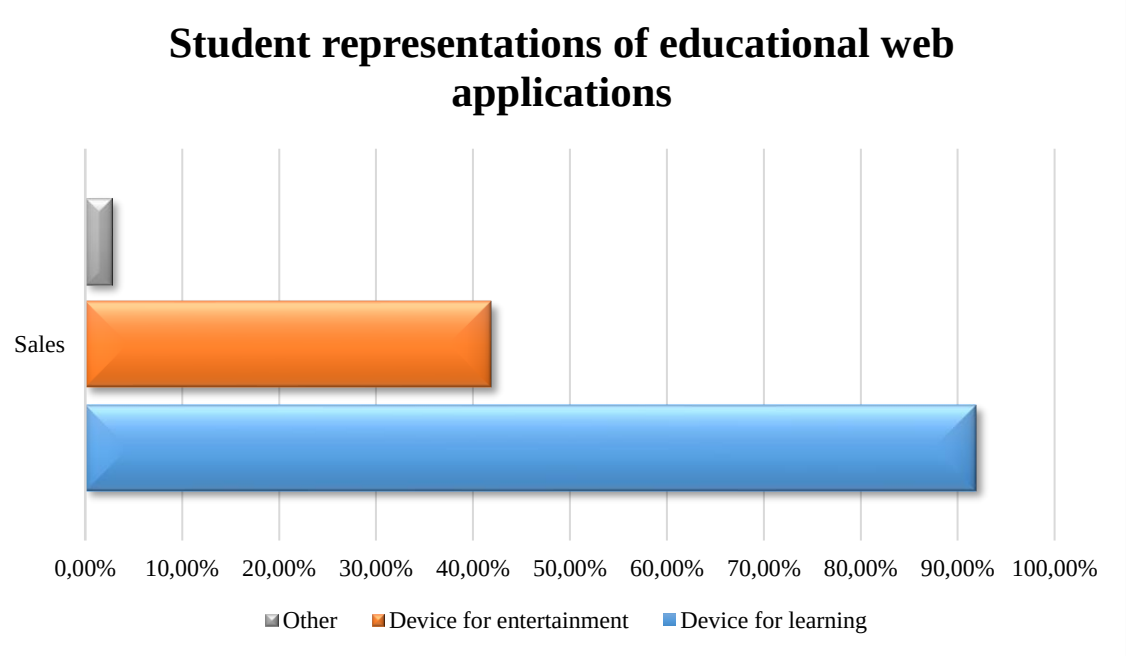
The main results of the presented work, which directly relate to the working hypotheses of the study, indicate that the use of web-based applications by students in higher education for learning foreign languages is not a natural phenomenon, but is socially constructed and that it is related to the social, cultural and technological context of the studied higher education institutions.

For 61% of students, a mobile device is an information and communication device. For 47% of students, it is a device for academic learning (Fig. 1):



Source : author's own development

For 91.9% of students, educational web applications are a learning tool. At the same time, for 41.9% of students, the use of educational web applications was motivated by learning and educational realities (mainly distance learning, lack of documents in English, most teachers teach the material in digital format) (Fig. 2):



Source : author's own development.

According to students' responses, the two most widely used educational mobile apps are Duolingo (34.7%) and LingApp (26.6%). The majority of students (48%) have been using educational mobile web applications for two years or more. 35.2% of them used educational mobile educational mobile web applications for the first time.

For most students, the main activity they perform in educational mobile web applications is

translation (46%). It should be noted that pronunciation/phonetics comes in second place.

The study shows that in many ways, students - whether they are regular users or not - have formed social representations of mobile web applications that include a sense of identity and capabilities that are likely to facilitate and help their English language learning. For example, most students said that "it is easy to practice English even at home" (students 8, 13, 18), while others stated that "the mobile web app helps to express themselves more easily and corrects mistakes" (student 18).

The theoretical framework allowed us to identify social representations and their influence on the pedagogical integration of web applications in higher education.

For the students surveyed, educational mobile applications are primarily a learning tool.

In their opinion, educational web applications refer to the idea of access. Only one student noted that "web applications are useful because you can study even if you don't have the money to buy a textbook or dictionaries" (student 13). Another added that: "It's like a second teacher because it helps to deepen our knowledge" (student 1).

Finally, it is worth commenting on the lexical and semantic field of words used by the students in relation to the term 'web application': (course, important, deepen, and knowledge). In this context (student 7) noted: "The educational web application allows me to deepen my knowledge of English and to understand words or expressions that I did not understand". Similarly, "It is useful in the sense that it helps us to better understand a number of concepts that we were not aware of before. It also makes it easy for us to study because we always have our phone with the web application at hand" (student 12).

The following table clearly demonstrates the lexical and semantic meaning of "educational web application" for the focus group (Table 1):

Table 1.
Lexical and semantic meaning of the concept "educational web application"

Nouns	Adjectives	Verbs
Help	Important	Deepen
Access	Light	Understand
Course		
Knowledge		

Source : authors' own development

The first factor that motivates the use of educational web applications is related to educational realities. According to Achkan, V. V., Vlasenko, K. V., Lovianova, I., Rovenska, O. H., Sitak, I. V., Chumak, O. O., Semerikov, S., (2022), modern education requires students to be more actively involved in the learning process, to be independent, and to be creative in solving problems. Web-based applications provide an opportunity to develop these skills, help to acquire new knowledge and skills, support them in the learning process, and contribute to its effective assimilation. In the same context, Iyamuremye, Mukiza, Nsabayezu, Ukobizaba, & Ndihokubwayo (2021) note that educational web applications provide access to a wide range of diverse learning material that can be used for self-directed learning and knowledge improvement. They make learning more interesting and engage students in active forms of work, such as completing tasks, playing games, interacting with peers and teachers in a virtual environment. Also, the use of educational web applications increases the accessibility of education, especially for those students who are unable to attend traditional educational institutions and study remotely due to active hostilities (Kozlova & Polyezhayev, 2022). They allow for education anywhere and anytime, providing flexible conditions for learning and development.

In a related qualitative study, Hinze, Vanderschantz, Timpany, Cunningham, Saravani & Wilkinson (2023) highlighted the idea that educational web applications stimulate motivation to learn, facilitate access to learning resources, and provide an interactive and effective form of learning. They are an integral part of the educational process in the modern world and meet the needs of modern education. It should also be added that the individual presentation of the surveyed students also turned out to be social, as most students were told about web applications by their friends: "All students use these applications, so I wanted to try it

myself, and I have been using them ever since" (student 6). In this context, the topic of personal involvement of the student should also be touched upon, as evidenced by the expressions "myself" and "curiosity": "I myself had problems with some of the English exercises, being curious by nature, I went to the opera and found learning English easy" (student 1).

In a similar study, Bashori, van Hout, Strik & Cucchiarini (2022) emphasise the role of social and academic context in the use of educational web applications.

Students in Ukraine use educational web applications as "facilitating" educational resources in the context of higher education. They regularly use them even before entering higher education. Only 20.8% of them use applications very rarely. According to the category of students who use web applications frequently, they are influenced by the social context consisting of other students, and above all their friends who are already regular and regular users, they actively translate texts and practice pronunciation/phonetics.

The use of educational mobile applications by students in higher education institutions in Ukraine is a completely constructed fact. In fact, the realities of war have greatly contributed to the use of educational web applications for learning a foreign language. Some of the main advantages of using educational web applications for students in higher education institutions in Ukraine include accessibility and convenience. Most students own smartphones, so they can easily download educational web applications to their devices and access learning material anytime and anywhere.

Web-based educational applications also provide students with the opportunity to learn material at their own pace. They can repeat material that they find difficult to understand or move faster through material they have already mastered (Tabassum et al., 2022). This allows students to tailor their learning to their individual needs and enables more effective learning. In his study, Kharitonenko (2022) concludes that web-based educational applications can be interactive, allowing students to complete exercises and tests, receive instant feedback, and check their progress. This promotes active participation of students in their own learning process and helps them to learn more effectively.

Thus, these factors make educational web applications popular among students in higher education institutions in Ukraine. They have become essential tools to support student learning and development, and their importance and use may continue to grow in the future.

Conclusions

This study aimed to explore Ukrainian students' perceptions of web-based educational applications and how they utilise them in the context of higher education, particularly considering the impact of contextual factors such as the effects of war and the prevalence of smartphones. The deployment of information and communication technologies (ICTs) in higher education in Ukraine has undoubtedly generated excitement among all social strata, especially students. Web-based applications have made it possible to show that there is another opportunity in education that aims to help and assist students in their quest for knowledge and learning. These web-based applications used in education remain an indispensable means of promoting integration into the digital society.

Today, the topic of ICT and digital representations remains open for discussion and polemics in the Ukrainian context. So is the use of educational web applications. This is all the more true as it is reinforced by the place, context, and technical device used for information and communication, i.e. the choice of a smartphone (which is cheaper and easily accessible to everyone) as opposed to a computer. Ukrainian students' perceptions of web-based applications are related to contextual factors, in particular, the effects of war. Faced with these realities, students use educational web applications as a means of facilitating their learning. There are uses for translation, pronunciation, and phonetics. These uses, which are rooted in socio-cultural and academic realities, contribute to the deployment of technology in the digital age. While this study reveals the logic behind the use of educational web applications in higher education, there are limitations. The main limitation of the study is that it was conducted only among a limited group of students, which may limit the universality of the results and make it possible to apply them only in specific contexts. Furthermore, the study did not delve into the specific types of web-based educational applications that students were using, which could have provided more insights into how these tools are being utilized in higher education. Additionally, the study did not explore the effectiveness of these web-based applications in enhancing students' learning experiences or academic performance, which

could have provided more concrete evidence of their impact. It also did not consider the perspectives of educators or administrators, who play a crucial role in implementing and supporting the use of web-based educational applications in higher education. Understanding their perspectives could have provided a more comprehensive view of the challenges and opportunities associated with the integration of ICTs in higher education in Ukraine.

In conclusion, while the study provides valuable insights into Ukrainian students' perceptions of web-based educational applications, there are several limitations that should be addressed in future research to provide a more holistic understanding of the topic. By considering these limitations, future studies can build upon the findings of this study and contribute to the ongoing discourse on the use of ICTs in higher education.

It should also be borne in mind that the study presented depended on students' responses about their use of educational web applications, and that web applications are developing rapidly, so the study may be relevant only for a certain period of time.

Prospects for future research are to gain a more complete understanding of the topic under study. Thus, other factors such as the availability of the Internet or computer equipment, the type of educational institution, the level of technological equipment of the educational institution, etc. can also be taken into account in the future. Exploring the specific types of web-based educational applications that students are using in higher education and examine how these tools are being utilized in different academic disciplines could be of interest in order to gain more insights into their impact on learning outcomes. The investigation of the effectiveness of web-based educational applications in enhancing students' learning experiences and academic performance by collecting data on students' academic achievements, retention rates, and overall satisfaction with these tools is perspective.

Including the perspectives of educators and administrators in future research to understand their roles and challenges in implementing and supporting the use of web-based educational applications in higher education is also a beneficial perspective.

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