Recent Results of Applying Information Technology to Student Learning

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Abstract:

The rapid expansion and development of educational technology will give rise to non-traditional educational methods, strongly promoting the growth of a deeply transformative human-centered education system. It is undeniable that the application of information technology (IT) is a prevailing trend, both now and in the future, in the teaching and learning process. This necessitates a reassessment of the importance of IT in education in general, and higher education in particular. Additionally, there is a need for research to explore the current state of IT implementation in universities.

***Keywords:** Information Technology (IT), learning, students*

1. Introduction

Information technology (IT) offers numerous benefits to individuals, enabling them to learn, conduct research, and access new knowledge from around the world. According to predictions by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), IT will fundamentally and comprehensively transform education, creating a highly integrated and systematic approach by the early 21st century.

Today, the world is dominated by IT, and it is evolving at a rapid pace. No one can predict what will happen next. Academic qualifications are merely the key to unlocking entry into the job market. To secure employment, students need to acquire additional skills. This highlights the necessity for students, beyond their academic studies, to equip themselves with various skills. Currently, how do students use IT to acquire these skills and prepare for the workforce? To what extent do they effectively use IT for self-learning?

The integration of IT in student learning is gradually eliminating traditional teaching and learning models that rely solely on classroom instruction with chalk and blackboards, which have become outdated.

Instead, the advent of various IT devices such as computers, smartphones, the internet, and social media is breaking down the barriers of the physical classroom, creating an endless connection of space and time in the teaching and learning process. IT applications have sparked limitless creativity, enabling diverse learning groups to interact via social networks. With the vast resources available on the internet, students can leverage data to supplement the knowledge they seek. This makes student learning more accessible, diverse, and rich.

So, which online resources are students primarily using to find materials? What social networks do they use for academic exchange? Which applications or software are they relying on for their studies? Do they face any obstacles in applying IT to their learning? These are important issues that require further research to develop solutions that support students effectively.

2. Literature review

To provide a foundation for examining the current state of IT application in student learning, the authors have synthesized previous research on this topic. The following studies are reviewed:

[8] In the study "The Role of Technology in Education," it is argued that integrating IT into learning and research offers numerous opportunities for students. For instance, the use of technologies such as digital cameras, projectors, brain-training software, computers, and PowerPoint can enhance student presentations. Additionally, the integration of IT in the classroom has diversified learning methods. It allows students to interact more with their peers and fosters collaboration among class members. With IT readily available in classrooms, students can access up-to-date information faster and more easily than ever before. They can obtain digital materials that are constantly updated, often more engaging, useful, and creative, and far less expensive than textbooks. Moreover, students can access these materials from anywhere, whether they are at school, at home, or anywhere in the world. This has significantly increased the effectiveness of IT in education, eliminating geographical distance and barriers to accessing materials.

[10] argues that the application of IT in learning enables students to create their own videos. Videos produced by students themselves foster active and enthusiastic participation in the learning process. Moreover, the creation of videos in the classroom has developed students' thinking and creativity, while also enhancing their teamwork skills and promoting the school's reputation.

[15] suggests that when students apply IT in their learning, they can participate in distance education courses. This benefit can help address the shortage of faculty. Additionally, IT can reduce the lack of study materials by providing digital resources. IT also facilitates online foreign language learning by connecting student groups with teachers from other countries. With the advent of online degree programs, there is little need for physical presence in the classroom. Some international universities have even started offering online degree courses that students can join remotely.

Currently, several universities, such as Hanoi Open University, National Economics University, Ho Chi Minh City Open University, Tra Vinh University, Vinh University, Thai Nguyen University, and Hanoi University, have established distance learning programs.

These programs allow students to participate while saving on travel costs and offering flexible scheduling. Many Vietnamese students are also engaging in distance learning courses from universities worldwide.

[2] suggests that IT applications motivate students to work in teams. Learners can practice their collaboration skills by participating in various online exercises. Technology fosters cooperation not only within the same classroom or school but also with students in different classrooms around the globe.

In addition to the aforementioned benefits of IT applications in learning, IT also helps learners develop practical skills, including creating presentations, distinguishing reliable information on the Internet, and learning appropriate online etiquette and email writing styles. These are essential skills that can be cultivated in the classroom, which enhance students' academic performance [18].

Moreover, IT applications make online learning more accessible and widespread. During the COVID-19 pandemic, with government-mandated social distancing, IT enabled students and teachers to continue their education programs without long interruptions. IT also facilitated group work and discussions between students and instructors. In Vietnam, software like Zoom and Google Meet were widely used in university teaching and proved effective not only for instruction but also for collective events like orientation ceremonies and military training courses.

[1] discusses the application of IT in student research, noting that its effectiveness is reflected in the use of mobile data and online platforms for gathering research information. Students in remote geographical areas studying local phenomena can collaborate with peers conducting similar research anywhere in the world.

The advantages of IT applications in scientific research are particularly evident. Online tools for data collection enable researchers to conduct studies more efficiently and accurately, while also reducing travel costs. This is especially beneficial for students conducting research, as it allows for low-cost, high-efficiency projects.

For students majoring in fields related to the arts, such as vocal music, the application of IT allows them to create music or publish their works to a global audience, regardless of their university [3]. The use of IT in education not only facilitates quick and effective connections between students and instructors but also enables students to proactively develop learning methods beyond the classroom. For example, students can independently join specialized groups and practice more easily, or they can take advantage of electronic learning materials such as recorded lectures or visit museums, libraries, and other external environments [8].

The use of IT in learning also reduces the need for paper and note-taking by both students and instructors, contributing to environmental conservation. This allows class time to be devoted to important questions and creative problem-solving [13].

[12] suggests that with the support of projectors, computers, the internet, and whiteboards, instructors can enhance their lessons by using websites like YouTube, which contains videos for academic reference. E-textbooks or web-based content can be updated in real time, and instructors can help students practice collaboration skills through group work using materials or video conferencing technology. This enables collaboration to occur beyond the classroom, or even between classrooms at different locations.

In the previous section, the authors reviewed studies on the current state of IT application in student learning. In this section, the authors continue to examine studies that highlight the factors influencing the use of IT in education.

[2] identified the university's infrastructure as a crucial factor affecting the effectiveness of IT in student learning and research. Limited financial resources and the challenges of investing in computers, internet connectivity, and comprehensive software are significant obstacles for many universities. Not all universities can afford advanced equipment, reliable internet connections, and modern projectors for their classrooms. Additionally, online courses are often less effective than direct instruction.

[16] observed that schools in urban areas tend to have better infrastructure and faculty than those in rural areas, which contributes to improved educational quality. However, infrastructure and faculty are not the only factors. The study also emphasized that the effectiveness of IT in learning and research is largely influenced by the students themselves. IT applications in learning can sometimes lead to laziness in reading and critical thinking, as most resources are digital texts. While some students use information retrieval skills effectively, not all know how to leverage technology for better learning outcomes.

In the work by [4] on IT and higher education, the study pointed out that students' needs and experience with IT are key factors in their academic success. The research also found that access to technology directly impacts learning outcomes. Furthermore, the significance of various technological devices depends considerably on students' demographics. Most students expressed a preference for online learning environments and spent 1-4 hours per day studying online. Based on these findings, the study recommended that universities provide students with access to basic technology, remove bans on internet use in classrooms, expand Wi-Fi coverage and quality on campus, and enhance student engagement with IT. Most students prefer a blended learning environment that combines in-person and online education. They also find IT more useful for tasks such as tracking credits, degree planning, and conducting degree checks. [9] collected data via the web, qualitative analysis from interviews with 50 specialized student groups, survey data from 4,752 students, and longitudinal data analysis from 65 institutions. The research found that students' IT skills and experience significantly influenced their academic performance. Additionally, the study highlighted the importance of faculty in teaching IT, students' awareness of IT usage in courses, and the impact of IT on academic outcomes.

[14] explored the factors influencing IT application in student learning. The results indicated that the institution itself is one of the most influential factors, suggesting that schools need to adapt their ecosystems to meet students' learning contexts. The study also pointed out that faculty-related factors, such as instructors' engagement and age, are key variables affecting students' use of IT in learning. Beyond these variables, the study also identified that the inclusion of IT-related topics in curricula is crucial for the effective application of IT in education.

3. Methodology

This study employs in-depth interviews with 40 students within the research area in 2024. The sampling framework includes diverse criteria such as academic disciplines, gender, and year of study. In addition, the article utilizes the document analysis method. The sources analyzed include studies related to the current state of students' use of information technology (IT) for learning, as well as research identifying the advantages and challenges of using IT in education.

4. Discussion and Findings

Through reviewing recent studies and collecting data, the authors identified that the use of information technology in students' learning occurs in the following areas:

Students' Application of Information Technology in Online Learning

Online learning has become a prominent trend for both the present and the future. Its advantages are undeniable, including cost savings, reduced travel time, and the ability for learners to control their study schedule flexibly. Online learning also fosters self-discipline, as students can study anywhere with just a computer or smartphone connected to the internet.

Using IT to learn foreign languages, for example, can be engaging for students. Technology provides flexibility in terms of how and when learning occurs, promoting personalized language learning. It allows users to proceed at their own pace, in their own time, reducing the pressure typically felt from instructors.

A fourth-year sociology student shared: *"With the application of IT, learning is no longer as burdensome as it was before. Using supportive apps helps me improve skills I lack. For instance, instead of hiring a tutor or struggling on my own, I use the Duolingo app to learn new languages. It's convenient and cost-effective, which makes it highly useful"*.

This quote demonstrates the effectiveness of using IT in online foreign language learning and highlights how it is a smart and financially reasonable choice for students.

The application of IT in education has indeed made learning more accessible, bridging geographical gaps, and reducing the need for physical travel, especially during the COVID-19 pandemic. Although COVID-19 is now under control, platforms like Zoom are still commonly used by professors to meet with students, guide them through their final theses, and even support them in conducting research. The following interviews highlight the benefits of online learning software.

A third-year sociology student reflected: *"Online learning through Zoom during the COVID-19 period brought many benefits. For instance, I didn't need to commute, yet I still had access to diverse teaching materials. Students were given flexible learning opportunities with just a smartphone or computer connected to the internet. Zoom facilitates good interaction between students and professors. However, to achieve high efficiency, Zoom needs to be combined with suitable teaching methods, and students must be encouraged to manage their time and take the initiative"*.

Another student from the Social Work department stated: *"Zoom is quite convenient for distance learning, especially during rushed moments or challenging times like during the COVID-19 pandemic. Although there isn't direct interaction, I noticed that the level of communication increased, and participants were more engaged than in face-to-face settings. Online learning creates a comfortable and proactive environment.*

The screen-sharing function in Zoom makes it easy to present materials, and everyone can see the same content clearly, unlike in a physical classroom where those sitting further away may struggle to see. Additionally, it saves on travel costs and diversifies learning styles".

Despite the benefits, some students remain critical of online learning. One student remarked: *"I'm not fully satisfied with online learning because I prefer direct interaction. Although online learning has its advantages, sitting in one place for hours on end makes it hard to stay alert" .* These reflections underline both the strengths and challenges of IT-based online learning from the perspective of students, showing how it has transformed the learning landscape while also highlighting areas for improvement.

Students Utilize Information Technology for Time Management in Study

Time management is a critical skill for individuals. Effective time management allows individuals to organize daily plans and tasks based on their importance and priority. Time management software offers numerous benefits for students, such as enabling them to prioritize tasks and monitor their academic progress. With a clear plan in place, students feel more assured about the tasks they need to complete. Additionally, effective time management allows students to allocate more time for studying and extracurricular activities, ultimately enhancing their academic performance.

The application of information technology in students' time management is also a significant skill. Research by [6] suggests that numerous academic studies have focused on the relationship between time management and academic performance. The author argues that students' attitudes and levels of time management skills significantly impact their academic outcomes. The majority of students possess moderate time management skills, while only a small proportion demonstrate high-level skills. This finding aligns with the results of our study, which indicates that most students primarily use time management software for reminders. Students also frequently use such applications to take notes on events rather than relying on traditional written notes. With advancements in technology, many students prefer digital notes as they are more durable and easier to remember.

"I use Microsoft To Do for time management, which effectively helps me organize my schedule. It also allows me to note important information and categorize different tasks, breaking them down into smaller items," stated a male student in his third year from the Faculty of Finance and Banking.

"As a student who is both studying and working, I sometimes struggle to manage my schedule effectively. However, using a time management application on my phone has allowed me to balance my studies and work, and at times, I find I have extra time to learn new things and improve my lacking skills," shared a female student in her third year from the Faculty of Accounting.

Students Utilize Information Technology in Scientific Research

Scientific research is an essential component of academic training, aligning with the learning outcomes of educational programs. Students must learn to conduct scientific research during their time in school. Information technology (IT) serves as a valuable tool for students to gather, process, and store information.

Leveraging IT and the Internet allows for faster and more convenient implementation and publication of research findings.

As noted, researchers soon discovered that they could share their results almost instantly with colleagues around the world. Since most research is conducted at academic centers, students quickly engaged with online networks, utilizing email and searching for information.

"In scientific research, I can use various websites to find materials, such as Google Scholar and ResearchGate. These are effective tools for locating academic literature and articles. Additionally, I can use Microsoft Word and Microsoft PowerPoint to write reports and present my research," stated a male student in his fourth year from the Faculty of Sociology.

ResearchGate is a platform with over 11 million members, including scientists, scholars, and PhD holders. Users can create an account using a valid organizational email address. Upon successful registration, they can create profiles, upload photos, list publications, and upload full-text research documents. It serves as an excellent resource for researchers and scholars seeking collaboration, offering a free online research tool provided by Google. This tool allows users to search for academic literature, scientific articles, journals, white papers, and patents .

Thus, with the application of IT in scientific research, students can survey and gather information to support their studies without incurring significant costs.

"I often use applications such as Word, PowerPoint, Excel, Canva, SPSS, ChatGPT, and Microsoft To Do to assist with scientific research, complete assignments, prepare presentations, and take notes. Although I use these applications quite frequently, I typically utilize only a few basic features, as my assignments require only those specific functionalities," shared a female student in her third year from the Faculty of Law.

Students Utilize Information Technology in Online Forums and Social Learning Networks

In a world where technology is rapidly advancing, learning through social media has become incredibly easy and convenient for students globally, including those in Vietnam. Social networks and the Internet are repositories of knowledge and human achievements, enabling us to access information with remarkable ease.

It is widely believed that effective learning occurs through active engagement, characterized by the active participation of learners in lessons and activities. One study asserts that the use of social media facilitates active learning by fostering the development of virtual learning communities. Learners collaborate in virtual groups through interaction, cooperation, and collaboration. Learning in these virtual groups is based on active pedagogical methods. The authors' synthesis of the literature indicates that social media provides a creative platform for communication, interaction, and collaboration in the learning process. Furthermore, social media has become an integral part of social life for the majority of people.

In-depth interviews conducted by the authors reveal that students engage in online learning forums and social networks to share knowledge and educational resources:

"I participate in online learning forums because they allow me to access new knowledge from various individuals. This exposure benefits the skills I need to improve in my studies. Additionally, people in these forums support each other without expecting anything in return. I typically engage in forums or groups on Facebook, as it is one of the largest social networks today," stated a female student in her fourth year from the Faculty of Sociology.

"Currently, students often use social media platforms like Facebook, Instagram, and Twitter to seek information relevant to their studies.

Specifically, groups and pages dedicated to sharing knowledge, learning materials, and information related to their fields of study are quite popular on these platforms," noted a male student in his fourth year from the Faculty of Sociology.

"To enhance the effectiveness of applying IT in learning, students can undertake various activities to leverage modern tools and applications. Utilizing online learning software and applications such as Zoom and Google Classroom is essential. Students should explore online materials and information sources relevant to their study topics, which will help broaden their knowledge and enhance their skills. Furthermore, interacting and sharing information through forums and online communities is crucial. Participating in learning forums, online discussion groups, or professional communities allows students to network, exchange knowledge, and learn from others with similar interests," explained a male student in his third year from the Faculty of Sociology.

4. Conclusion

Currently, the use of information technology (IT) in students' learning has become very common, including among students at the Trade Union University. The support provided by IT enables students to engage in online learning, manage their time effectively, access online resources, participate in virtual classes, and even conduct scientific research, as well as develop additional skills to meet future job market demands.

The application of IT in education has proven to be effective, particularly in terms of information retrieval, online learning, soft skills development, and participation in online social communities and learning forums. Students frequently utilize applications like Google for research purposes, and ChatGPT has also become a popular tool among students for gathering information related to their studies. Social media platforms such as Facebook and Twitter are commonly used by students to exchange information and study materials. However, there is still a lack of systematic research in Vietnam regarding students' use of IT to acquire additional skills. This indicates a significant opportunity for future research on the application of IT in students' learning today.

References

1. Balyer, A., & Öz, Ö. (2018). Academicians' views on digital transformation in education. International Online Journal of Education and Teaching (IOJET), 5(4), 809–830

2. Bulman, G., & Fairlie, R. W. (2016). Technology and education: computers, software, and the internet, CMC University Handbook of the Economics of Education, Volume 5

3. Cukurova, M., & Luckin, R. (2018). Measuring the Impact of Emerging Technologies in Education: A Pragmatic Approach. 1181–1199. https://doi.org/10.1007/978-3-319-71054-9_81.

4. Galanek, J. D., Gierdowski, D. C., & Brooks, D. C. (2018). ECAR study of undergraduate students and information technology, 2018. https://www.educause.edu/ecar/research-publications/ecar-study-of-undergraduate-students-and-information-technology/2018/introduction-and-key-findings

5. Hussain, & Cakir (2018), Social media as a Learning Technology for University Students, International Journal of Instruction

6. Idris Yılmaz, Fatih Bektaş (2010), Relationship between the time management behavior and academic success, New World Sciences Academy 2010, Volume: 5, Number: 3, Article Number: 2B0051

7. Jambukar, S. (2014). Role of information technology in research: a study of tools with reference to improve the productivity of research process. https://www.academia.edu/28550071/ROLE_OF_INFORMATION_TECHNOLOGY_IN_R ESEARCH_A_STUDY_OF_TOOLS_WITH_REFERENCE_TO_IMPROVE_THE_PRODU CTIVITY_OF_RESEARCH_PROCESS

8. Krohn, R. (2003). The role of technology in education. Journal of Healthcare Information Management : JHIM, 17(3), 28–30.

9. Kvavik, R. B., & Caruso, J. B. (2007). The ECAR study of undergraduate students and information technology. Convenience, Connection, Control and Learning, 6, 134

10. Mohammed Mohammed Nasser Hassan Ja'ashan (2020), The Challenges and Prospects of Using E-learning among EFL Students in Bisha University , Arab World English Journal (AWEJ) Volume 11. Number1 March Pp.124-137

11. Nematpour, M. (2020). Farm tourism as a driving force for socioeconomic development: a benefits viewpoint from Iran. Current Issues In Tourism.

12. Ottestad, G., Mostert, M., Quinn, L., Ilomäki, L., Noor-Ul-Amin, S., Shum, I. P., Kong, C. H., Fox, R., Majumdar, S., Cox, M., Abbott, C., Blakeley, B., Beauchamp, T., Rhodes, V., Length, F., Hennessy, S., Ruthven, K., Deaney, R., Wong, E. M. L., … Hughes, J. (2008). Emerging Trends in ICT for Education & Training. Educational Technology and Society, 8(1), 94–101.

13. Padmanabhan, A. (2020). Advantages and Disadvantages of using technology for teaching and learning process in education. International Journal for Research Trends and Innovation (Www.Ijrti.Org), 5(4), 138–140

14. Silva, J. C., Coelho, J., & Vera, R. (2023). Factors influencing the use of information and communication technologies by students for educational purposes. In Education and Information Technologies (Issue 0123456789). Springer US. https://doi.org/10.1007/s10639-023-12132-6

15. Tracey Flemming et al. (2016). Reframing traditional understandings and practices, Teaching and Learning with Technology: 1–40

16. Vargas-montoya, L., Gimenez, G., & Fern, M. (2023). Socio-Economic Planning Sciences ICT use for learning and students' outcomes: Does the country's development level matter? 87(January).

17. Verma, A. (2019). Use of Information Technology inResearch. JETIR1908506 Journal of Emerging Technologies and Innovative Research, 6(6), 269–275.

18. Yuliana. (n.d.). The Challenges and Opportunities in Digital Transformation for Education during the COVID-19 pandemic. Conference, International Education Technology, O N Challenges, 10–18