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## **Literature Review**

The impact of modern technology on student learning  
experiences in higher education

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## Introduction

Technologies have been increasingly applied to numerous fields in society including the educational sector. It is important to understand the implications that technology brings to the student's learning experience and in higher education. Nowadays, students' learning styles and habits have changed. Olszewska (2021) has also stated that some educational technologies have become closer to our life such as online-learning platform and VLE (virtual learning environment) and has come along with the diversity of pedagogical model.

In this literature review, e-learning will be the focused technology to be discussed. Ellaway & Masters (2008) define e-learning as education with the assistance of the internet. It is also well known as online learning. As Palmer (2009) states that applying technology to education in a suitable approach can optimize the learning and teaching outcome and further result in stronger achievement, a different aspect of e-learning has been focused on in this paper, and the factors of learning experience have been discussed. In the end, all the extended research and examples have been categorized and compared in order to identify the key concept of the impact of modern technology on student learning experiences in higher education.

## The factors of the learning experience

Below are the factors of learning experience that will be focused on in this research.

### Involvement and Interaction

A higher level of involvement leads to a more comprehensive educational experience, and technologies provide an opportunity to reach the goal. Laird and Kuh (2005) have

discussed active and collaborative learning, a measure that concentrates on the participation of the learning activities and collaboration between students, which supports the importance of how students' involvement is related to the learning experience. Furthermore, interaction is also a crucial factor to consider regarding the learning experience, and the aspects to be discussed in this research include the interaction between learners and learners, learners and teachers, and learners and the knowledge. A student-centered approach proposes that by interacting with the available information, learners can form up knowledge in their own ways (Bose, 2003).

### Knowledge transfer

One of the critical processes of education is to transfer knowledge to the students, and this process can be conducted in various approaches owing to the assistance of technologies. Department for Education and Skills (2003) states e-learning provides benefits and potential learning solutions to accommodate the differences of the learners. In the 'concepts related to the quality of learning at university defined by Entwistle et al. (2002), it has mentioned the approaches to learning and the selection, demonstration, and access of the information have an impact on the quality of learning achieved.

### Creativity

Learners' educational experience can be enriched, and the learning motivation can be inspired by creativity applied in education, and the technologies provide expansive support and opportunity to achieve this. However, instead of applying technology as a set of static engineering implementations, it needs to be creative and flexible to adapt to different scenarios when supporting education with technology (Ellaway & Masters,

2008). Furthermore, technology enables and support the creation of product by rearranging, and reassembling the existing knowledge and data in order to accommodate different educational scenario (Ghory & Ghafory, 2021). Alkahtani's research (2017), states that computer technology has been involved in educational changes in many countries to boost creativity and critical thinking.

## Different aspects of e-learning

### Internet

Internet is a fundamental element of e-learning, and the benefit it brings have significantly changed the learning habits and experience of higher education nowadays. With the aid of the internet, the students are able to participate in learning activities even if they are not on campus, where the traditional pedagogical activity takes place. Internet brings convenience to the student to access learning material such as lecture recordings and online documentation and allows them to proceed with learning activities (Ghory & Ghafory, 2021). It means students can also interact with their tutors spontaneously and submit their assignments on time without a physical presence on campus (Olszewska, 2021).

Zembylas et al. (2008) researched the emotions in the experience of online learning at the Open University of Cyprus, and it recorded that satisfaction was raised from the students about the option of learning from home, which significantly changes their study-life balance in a positive way. With the increasing demand for lifetime learning, while challenging for people to pursue higher education with limited time, the internet provides a key solution that makes higher education possible to be conducted through e-learning (Gáti & Kartyas, 2009).

### Online degree

Online degrees in higher education such as universities can be fulfilled by transitioning the program fully into e-learning. Courville (2011) asserts that distance education programs have been increasingly offered by graduate schools and institutes that allow students to pursue an online degree, and this is also supported by Ghory and Ghafory (2021). It means other than additional e-learning materials added to the traditional education, the whole learning program will take place online and allow the students to participate in the educational activities without physical presence. This opens the gate for those students who intend to study for a degree who was struggling with geographical restrictions. From the research of Zembylas et al. (2008), the opportunity of online programmes at university along with its feature of flexibility brings positive feedback from the students.

### Resource access

Technology changes the way how to access resources, especially for higher education students. Instead of receiving learning papers directly from the teacher in traditional education, studying material and academic resources can be uploaded to the e-learning platform where students can access them easily. It brings convenience to the students to navigate to the target document within a few clicks without being stressed out from sorting and dealing with a huge pile of studying papers. Although students will still need to have their learning paper printed out in the situation when they do not have the computer or internet access (Gilbert et al., 2007).

Via technologies, students can also access public resources easily as well. Courville (2011) reports that the database of certain research fields hosted by the

National Institute of Health provides easy access to students for research purposes, and technologies have been increasingly used for healthcare education. This advantage technologies bring allows medical students to conduct wider research easily and encourage them to achieve better understanding through the investigation of the healthcare field.

While accessing online resource have become common in higher education and the majority of students have the basic information searching and finding skill, the critical analysis and reflection skill seems to be missing. Therefore, higher education also provides students with courses in these topics to maximize the outcome of the student's research skills (Palme, 2009). Bose's research (2003) also corresponds to this statement that online materials are provided in some e-learning courses with hyperlinks to encourage the student to interact with the provided material and further improve their research skill.

#### Teaching and learning method

Technologies have a considerable impact on the teaching and learning methodology and introduced alternative teaching approaches which consequently affect the learning habit. As the e-learning takes place online, VLE (Virtual Learning Environment) is introduced which provided a platform that is a user interface that handles all aspects of the e-learning component and module. VLE allowed multiple types of teaching media such as text, slides, and video to be uploaded and incorporated and further provided the students with diverse learning resources (Olszewska, 2021). With these feature technologies provided, knowledge can also be presented with visualization of learning content and improve the understanding of the

students (Courville, 2011). The research of Ghory & Ghafory (2021) also stated that visual explanations can trigger learners' interest and improve learning outcomes.

From the traditional 'teaching-centered' method, technologies have also helped to raise awareness of the 'learning-centered' concept (Kirkwood & Price, 2011). The student / learner-centered method with innovative approaches encourages the students to involve and investigate the information and gain knowledge through the process of interacting with the information (Ghory & Ghafory, 2021; Bose, 2003). Instead of the one-way receiving information from traditional education, the learner-centered method increases the involvement of the student in the pedagogical process and helps develop the student's critical thinking ability. And e-learning includes a suitable environment for the learner-centered approach with its technical advantage and flexibility (Ellaway & Masters, 2008).

E-learning has the advantage of learning solution personalization, which can accommodate a wider range of learning requirements (Department for Education and Skills, 2003). Olszewska (2021) identifies various teaching methods used for VLE include: lectures, lab work, workshops, tutorials, seminars, exercises, etc. which supports the statement that e-learning can be a high personalization and adaptable tool. The research of Zembylas et al (2008), mentions that students are satisfied with the achievement they received from e-learning by fulfilling the course requests, while some students reflected the unfamiliar online learning method causes them anxiety.

## Communication

Information Communication Technology (ICT) improves the qualitative of communication between students and teachers located in different area which allow



students to have chances to interact with their peers from different countries (Courville, 2011) and collaborate with individuals with different cultures (Ghory & Ghafory, 2021). It offers an international and multicultural learning environment which is beneficial to students' awareness of cultural diversity and global mindset development. Courville reports with the assistance of technology, the educational institution can host online conferences and webinars to include multiple classes and allow broad collaboration.

Laird and Kuh (2005) assert using email appropriately as a communication tool between faculty staff and students encourages interaction and collaboration. Other than email, in modern days, technologies have developed various communication tools available in the e-learning interface which enhances the communication convenience and quality between learners and teachers. It offers the advantage for the students to submit their assignments and engage in discussion and offers the tutor to post feedback and announcements (Olszewska, 2021). The research of Gilbert et al. (2007) has shown many students found discussion forums as an appropriate and useful communication tool that allows online interaction with peers and tutors, while some need more time to feel comfortable using online forums as a replacement for face-to-face discussion.

There are several online tools that improve the online learning experience mentioned by Olszewska (2021) such as share drive (e.g. Google Drive) which allows documents to be shared and edited by multiple users, and blogs (e.g. Slack) which provides a web-based platform for discussion. Zembylas et al (2008) report that positive feedback grows among students while they are used to taking advantage of online communication more systematically. However, their study also shows that loneliness

and isolation emotions have raise among students result of lack of direct contact with teachers and other learners and further causes dissatisfaction (Childs et al., 2005).

## Conclusion

There is much research identified the factors that affect the learning experience, and there are also deep discussions focusing on each aspect of e-learning. Based on extended research, has shown that e-learning is increasingly applied to the modern education module. However, there is limited research targeting how students should respond to the impact the technologies bring to education, how to prepare and the learning pattern changes.

A study (Zembylas et al, 2008) has shown that a lack of understanding of e-learning tools can result in anxiety, but this situation can get improved while the learners are getting familiar with the e-learning. Poon (2013) also states that students with a positive mindset toward e-learning are more likely to be successful. There is little research focusing on how the students of higher education accommodate the Implications of the technologies in their study. Therefore, further research should aim for filling this gap and identify the key solutions to maximize the student's learning outcome.

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