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The Effect of E-Learning in the Digital Age

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Abstract

The focus is now on moving towards student-centered learning that helps create authentic student experiences by engaging them in higher-order thinking compared to traditional didactic classroom teaching. Knowing how students engage with digital learning tools can play a vital role in managing and leveraging technology to enhance student learning. Studies on the impact of digital technology use on academic performance and subsequent placement of students graduating from higher education institutions are very limited. This research explores the impact of digital learning tools used on students' academic performance and placement packages.

Keywords

E-Learning., Learning Outcome, Student, Digital Technology & E-Learning Economic Wise

1. Introduction

Compared to the 21st century, the education sector of fifty years ago is no longer sufficient to achieve success in college, career, and citizenship. It is difficult to prepare students for work, citizenship, and life in the 21st century. Globalization, innovation, migration, international competition, changing markets, and transnational environmental and political challenges place a new emphasis on developing the skills and knowledge that learners will need to succeed in the 21st century. Moreover, the COVID-19 pandemic has impacted traditional learning approaches in academic institutions around the world. Moreover, the educational view has recently changed due to technological advances. Higher education institutions make the best use of available resources and maintain current learning as human knowledge grows and technology advances. ICT offers many benefits in an era determined to create new paths to quality education. Information and communication technology (ICT) simplifies many mundane tasks and allows communication from almost anywhere on the planet. The use of ICT in education has been linked

to improving people's lives by improving teaching and learning. In addition, the use of ICT in learning and teaching has a significant positive impact on students' learning abilities. It has been shown that when students use computers to complete assigned tasks, they reflect a very positive attitude toward work and learning, which encourages and motivates them to absorb knowledge. Students in educational institutions who have used technology for learning have higher self-esteem and self-confidence. As a result, an increasing number of educational institutions are integrating ICT into their educational systems. With the advancement of technology, higher education institutions can now track resources, develop smarter lesson plans, design safer campuses, and improve access to information. Education looks very different today, thanks to the use of mobile phones and tablets in the classroom. In short, recent advances in technology enable learners to learn more effectively, efficiently, flexibly, and conveniently. Learners use smart devices to connect to digital resources via a wireless network and engage in seamless, personalized learning. Smart learning is a popular concept that describes learning in the digital age.

E-learning has emerged as a new model in education that uses technology to strengthen and transform the traditional education system. E-learning is a system that combines the use of technology, pedagogy, and content to provide students with a personal learning experience. With the advent of digital technologies, E-learning is becoming increasingly popular, and many schools and universities are adopting this approach to teaching and learning. However, there is a need to assess the impact of e-learning on learning outcomes to determine its effectiveness. Therefore, the aim of this systematic review is to explore the impact of e-learning on learning outcomes.

- **Research Importance**

The importance of this research is highlighted by its presentation of the role of e-learning in this digital age. It positively impacts students' engagement, motivation, and achievement. However, the effectiveness of e-learning varies depending on the context and technology used. E-learning is vital in the digital age because it has the potential to transform the traditional education system and provide students with a personalized learning experience.

- **Research Objectives**

The term e-learning refers to the use of digital technology to enhance and transform the traditional education system. This research explores the influence of e-learning on student learning outcomes, highlighting the mediating role of teacher resilience in educational settings.

- **Research Methodology**

In this Research, the narrative synthesis approach was followed. Data were analysed by using the documentary approach and content analysis through a systematic review. The qualitative data analysis program (NVivo) was also used for interpretation and analysis.

- **Keywords:**

- E-Learning.

- Learning Outcome.
- Student.
- Digital Technology.

2. Literature Review

2.1. E-Learning Transformation

E-learning has emerged as a new model in education that uses technology to enhance and transform the traditional education system. E-learning is a system that combines the use of technology, pedagogy, and content to provide students with a personalized learning experience. With the advent of digital technologies, e-learning has become increasingly popular, and many schools and universities have adopted this approach to teaching and learning.

In 2019, the global COVID-19 outbreak had a profound impact on education, prompting all educational institutions to shift from traditional to e-learning. To facilitate this transition, educational institutions have had to adopt different digital platforms, each with different capabilities and strategies, making digital technology the primary means of education during the outbreak for students and universities (Mustapha, 2021: pp. 136-154). The transition to e-learning by higher education institutions during the pandemic has affected learners, lecturers, and learning performance. Higher education now offers programs through three forms: distance learning (DL), face-to-face learning (FFL), and hybrid learning (HL). The use of technology in higher education offers many benefits, such as allowing students to watch appropriately recorded lectures and engage in more interactive activities, facilitating better collaboration among students, and transforming the role of the instructor into a facilitator. However, higher education was not prepared for this sudden shift (Mahlangu, 2018: pp. 17-29). Mahlangu (2018: pp. 17-29) identifies many challenges associated with hybrid and distance learning, such as quality assurance, negative resistance, inadequate training for lecturers on the use of digital tools, and lack of tools and techniques that facilitate adaptation. In response to the epidemic, institutions of higher education continue to use digital platforms to facilitate cooperation.

Digital transformation has profoundly changed education and impacted teaching and learning methods. Both lecturers and students have adapted to this shift. The COVID-19 pandemic has forced universities to accelerate the digital transformation of higher education, integrating digital technologies to accommodate social distancing measures. This has led to a widespread shift to online learning, requiring institutions to quickly adjust resources and methods (Abu, 2001). Posing significant challenges for students and lecturers who need technical support. While digital transformation began years ago, COVID-19 dramatically accelerated it, affecting students' experiences (García-Morales et al., 2021).

Access to and availability of educational resources has been revolutionized by digital technology. Students and teachers can access educational resources at any time and from any location, thanks to digital devices such as mobile phones, laptops, and tablets. Online libraries, academic journals, e-books, research papers,

and other resources were made available online. Furthermore, educational websites provide free online courses and increase access to and affordability of education. (Rajesh, 2019: pp. 78-81)

In addition, thanks to digital technology, interactive learning tools such as simulation, gaming, and multimedia information have become possible. These tools give students a more immersive and practical learning experience, improving their understanding and memory of the subject. For example, virtual reality simulations allow students to examine ideas such as chemical structures, planetary systems, and unimaginable historical sites. (Rajesh, 2019: pp. 78-81)

E-learning has expanded and increased in popularity over the past several years thanks to digital technologies. Students can access education in a flexible and accessible manner through e-learning and their own quick learning from any site in the world. Professionals can also learn new skills and knowledge through e-courses without interrupting their daily schedules. (Rajesh, 2019: pp. 78-81)

As a result of e-learning, Major Open Online Courses have emerged, providing free access to courses offered by universities and prominent educational institutions. Regardless of financial or geographical constraints, more people are now able to access high-quality education thanks to open online courses. (Rajesh, 2019: pp. 78-81)

In addition, in-person learning is made possible by digital technology, where academic subjects are dedicated to each student's needs, interests, and learning preferences. Using digital technology, personal learning provides adaptive learning, adjusting the speed and level of challenge of educational materials to suit students' skill levels. In order to give students opportunities for individual learning, adaptive learning uses data analytics and machine learning algorithms to identify students' strengths and shortcomings. (Rajesh, 2019: pp. 78-81)

Digitization is critical for community, economic, and commercial development. The European Commission expects a transformative industrial and technological revolution affecting all aspects of society by 2030 (Navaridas-Nalda et al., 2020). E-learning has become vital during epidemics, with innovative digital practices that enhance students' abilities and mental health (Hanelt et al., 2020: pp. 1159-1197). Sustainable growth in education requires stakeholder participation and quality management practices facilitated by digital technologies (Verhoef et al., 2021: pp. 889-901).

2.2. Types of E-Learning Technology

Digital technology has revolutionized the way students learn and interact with this topic, which has had a significant impact on education. Digital technology is used in education in a variety of ways, each with special advantages and uses. We'll talk about some of the most popular categories of digital technology used in education. (Rajesh, 2019: pp. 78-81)

- Mobile Devices: Due to the accessibility of mobile devices such as smartphones and tablets, students can access course materials at any time and from any location. Mobile devices can be used to access e-learning resources, watch educational films, and download educational applications. Teachers can communicate with

students and share educational resources via mobile devices. Students can benefit from a tailored individual learning experience through mobile devices, allowing them to learn at their own pace and according to their own preferences.

- Smart Board: Also known as interactive whiteboards, smart panels give teachers the ability to communicate knowledge interactively and attractively to their students. Trainers can view photos, movies, and other multimedia information on smart boards. Students' ability to follow and understand the subject is facilitated by their ability to comment and draw on the painting. Students may work together to solve problems and share ideas thanks to smart boards that promote active learning.
- Open Online Courses (OOCs): OOCs are online courses accessible from any site in the world and can be taken for free. OOCs can be taken at a student's own pace and are often free or inexpensive. Students can access first-class education resources from renowned universities and subject experts through OOCs. In addition, it provides a flexible learning environment that enables students to absorb their learning about other commitments.
- Using VR Technology: students can interact with a simulated environment that looks real. Virtual reality can be used in the classroom to design unforgettable, immersive learning experiences. For example, students can learn about complex topics in a fun and attractive way by using virtual reality to explore historical sites, carry out virtual scientific projects or learn about difficult topics. Virtual Reality (VR) can give students a practical learning experience that is difficult to reproduce in the real world.
- Artificial Intelligence (AI): Artificial intelligence can be applied in the classroom to adapt to each student's educational experience. AI may review students' data to identify areas where a student needs additional help and provide expert criticism and guidance. In addition, AI can offer personalized learning experiences adapted to each student's unique learning preferences and speed.
- Gamification: This is the use of game design ideas in situations other than games, such as education. By including items such as competition, bonuses, and comments, games can make learning more motivating and engaging. For example, teachers can use educational games to involve pupils in mathematics lessons or playful and interactive science lessons. Games can also provide pupils with a sense of achievement and evolution, which will motivate them to continue learning.
- Asynchronous Learning Platforms: These tools help students access course content and finish tasks according to their schedule and at their own speed. Students may benefit from an adaptable and personalized learning experience through asynchronous learning tailored to their unique needs and preferences.

2.3. Advantages of E-Learning

E-learning has completely changed the way learning is delivered to students. Unlike the traditional chalk and blackboard teaching methods, e-learning makes

learning simpler, easier, and more effective. Here are some features of e-learning that make it beneficial for students (Gupta, 2017):

- Flexibility: One of the most important benefits of e-learning is the flexibility it provides, as it allows students to set their own schedules. This flexibility includes the ability to attend classes from anywhere and to arrange classes according to a busy schedule.
- Convenience: E-learning can also be useful for students from remote areas without access to campus/school. The advantages of online learning in terms of convenience also include the ability to access online lectures, communicate with professors via email, and access online platforms and tools that can upgrade your learning experience.
- Affordability: Another feature of e-learning is its tendency to be more cost-effective than traditional on-campus/school classes. E-learning often has lower tuition fees, and students do not need to spend money on site-related expenses. The advantages of e-learning in terms of cost-effectiveness also include the possibility of saving money on textbooks and avoiding transportation costs.
- Access to a Wider Range of Programs and Course Offerings: E-learning also provides access to a wider range of programs and courses, thanks to the ability to reach more students without the high costs of maintaining physical classrooms. Many universities, colleges, and schools now offer a wide range of online degree programs, including bachelor's and master's degrees, in a variety of fields.
- The Ability to Learn at Students' Own Pace: Another feature of e-learning is the ability to learn at a student's own pace. Every student has their own research pace, and this is where the advantages of distance learning really play out. E-learning gives students the ability to set their own pace, review subjects as needed, and proceed with courses in a manner appropriate to their teaching style. Learning at a student's own pace allows him to take absolute control of his learning process, so it's really one of the biggest benefits of online classrooms.

3. Disadvantages of E-Learning

Despite the great enthusiasm for e-learning, teachers around the world are still aware of some of the key issues afflicting the new education approach. Here's a closer look at some of these problems (Tamm, 2023):

- Lack of Face-to-Face Interaction: One of the main drawbacks of e-learning is the lack of physical interaction, which can make it difficult for a student to connect with fellow students and teachers. This can make it difficult for a student to create a sense of community, which can be an important factor in a student's ability to get the most out of their studies.
- Difficulty Staying Motivated: Another disadvantage of e-learning is the difficulty of maintaining focus when a student is studying alone. E-learning is often done independently, which can make navigation, interaction, and motivation more difficult. Before choosing to study online, it is important for a student to assess their ability to stick to their plan, be consistent, and work hard to achieve their goals.
- Limited Access to Resources and Support: When considering the pros and

cons of e-learning, it is important to keep in mind that e-learning sometimes provides limited access to resources and support compared to traditional on-campus classrooms.

- Technical Difficulties: When studying online, a student relies on internet access. Technical difficulties such as internet connection issues, software compatibility issues, or laptop problems can hinder the ability to access classes.
- Isolation: Another potential drawback to consider is that online education can lead to feelings of isolation, as students are not physically in the classroom and may not have the same opportunities to interact with other students and form social relationships.

• Case study for the questionnaire used between normal study and E-learning for Math module. Accordingly, ten questions were asked of the students. Accordingly, ten questions were asked to the students as shown in the below Table 1.

Table 1. The ten questions.

Q1	Like using e-learning for Math modules.
Q2	Do you think the teacher's application of e-learning in teaching Math modules helps you improve your skills in Math?
Q3	Do you think that the teacher's application of e-learning in teaching Math modules is not useful?
Q4	I am unwilling to learn math modules through e-learning.
Q5	By using e-learning for Math modules, the opportunity to interact with my classmates is enhanced.
Q6	E-learning makes me more interested in learning Math.
Q7	Using Math e-learning modules is more interesting than the paper method.
Q8	I think my grades will improve by using E-learning for Math modules.
Q9	By using E-learning for Math modules, the opportunity to interact with the teacher is enhanced.
Q10	I hope that Math teachers continue to use e-learning in their teaching.

- Chart 1 below shows the results of students' answers (normal study blue color and E-learning orange color).

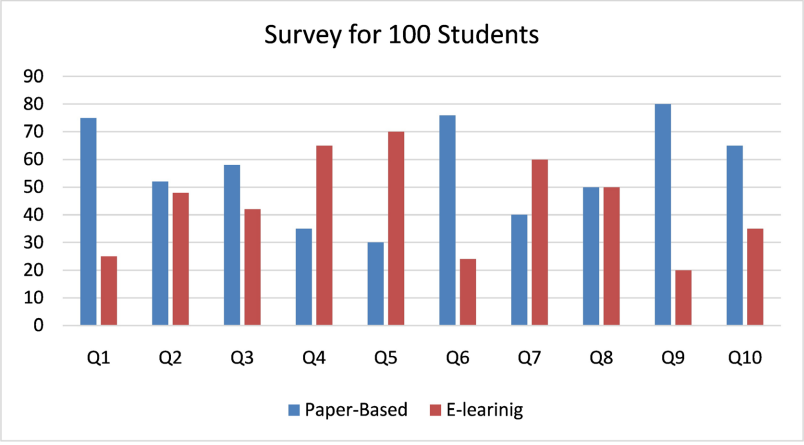

Chart 1. Students survey.

4. Digital Literacy of Teachers

It is quite clear nowadays that for e-learning to become a dominant pattern of

learning, technology alone will not be enough. Students need digitally confident academics. New techniques require the academic college to assume new responsibilities and develop a range of new skills. Many studies identify a long list of roles teachers are expected to play when using new technologies in their teaching (Alexander et al., 2017; Bates & Sangra, 2011; Benson & Brack, 2009: pp. 71-80); for example, identified the following tasks that teachers are expected to perform in online teaching: providing curricula, educational resources, communication tools and learning strategies; monitoring and evaluating learning and providing feedback, treatment and grades; identification and resolution of educational, personal and technical problems; The establishment of an educational society in which learners feel safe and connected and believe that their contributions are valid. Certainly, it is a long list of responsibilities that most professors were not prepared for in socialization processes in the academic world.

Currently, most universities do not have broad strategies in place to address the e-literacy needs of academic faculty. Most academic faculty are ill-equipped to guide students in developing the digital competencies they need. Interestingly, in the Stanford History Education Group report, not only did 60% of Stanford students fail to identify online sources, but 40% of academic faculty also failed to trace information back to its source. These were historians who had been trained for decades to look closely and critically at texts. Yet many were unable to overcome a simple problem of web credibility (Wineburg et al., 2016).

In response to the growing need for teachers who are digitally literate and able to prepare students with applied ICT literacy skills, the Educational Testing Service (ETS) in the United States has developed a new certification program called ICritical Thinking—a certification supported by ETS (ETS, 2009). ICritical Thinking features real-time, scenario-based simulations designed to measure teachers' ability to navigate, critically evaluate, and understand the wealth of information available through digital technologies. The ICritical Thinking certification exam provides a clear understanding of how teachers integrate and integrate technologies while performing a range of tasks, such as: defining (understanding and articulating the scope of an information problem to facilitate electronic information search); accessing (gathering or retrieving information in digital environments); evaluating (judging whether information meets an information problem by determining authority, bias, timeliness, relevance, and other aspects of the material); managing (organizing information to help you or others find it later); integrating (interpreting and representing information using digital tools to summarize, compare, and contrast information from multiple sources); creating (adapting, applying, designing, and constructing information in digital environments); and communication (disseminating information specifically designed for a specific audience in an effective digital format) (Educational Testing Service, 2009). Based on the test results, appropriate training programs are designed for teachers.

There is an urgent need for universities/ Schools to invest in digital literacy among faculty. Faculty working in a digital environment without adequate training, support, or resources are likely to feel disillusioned with both the product and the process, and this reaction may naturally extend to their students. Such a finding only reinforces the inherent skepticism about the beneficial applications of digital technologies in academia.

Diverse digital environments should be created in universities and schools where academics can experiment with technology-enhanced learning tools and discuss the pedagogy that supports their use so that they can facilitate student engagement (Alexander et al., 2017; Johnson et al., 2016;). It is clear that as technology evolves and new uses proliferate, the meaning of digital literacy will continue to evolve. New tools and practices will present both teachers and students with potential needs for new skills.

5. NVivo Analysis

The above analysis, interpretation, and explanations were performed based on NVivo. The following images illustrate the word frequency query (word cloud) and text search (word tree). (Figures 1-3)

Figure 1. Word cloud.

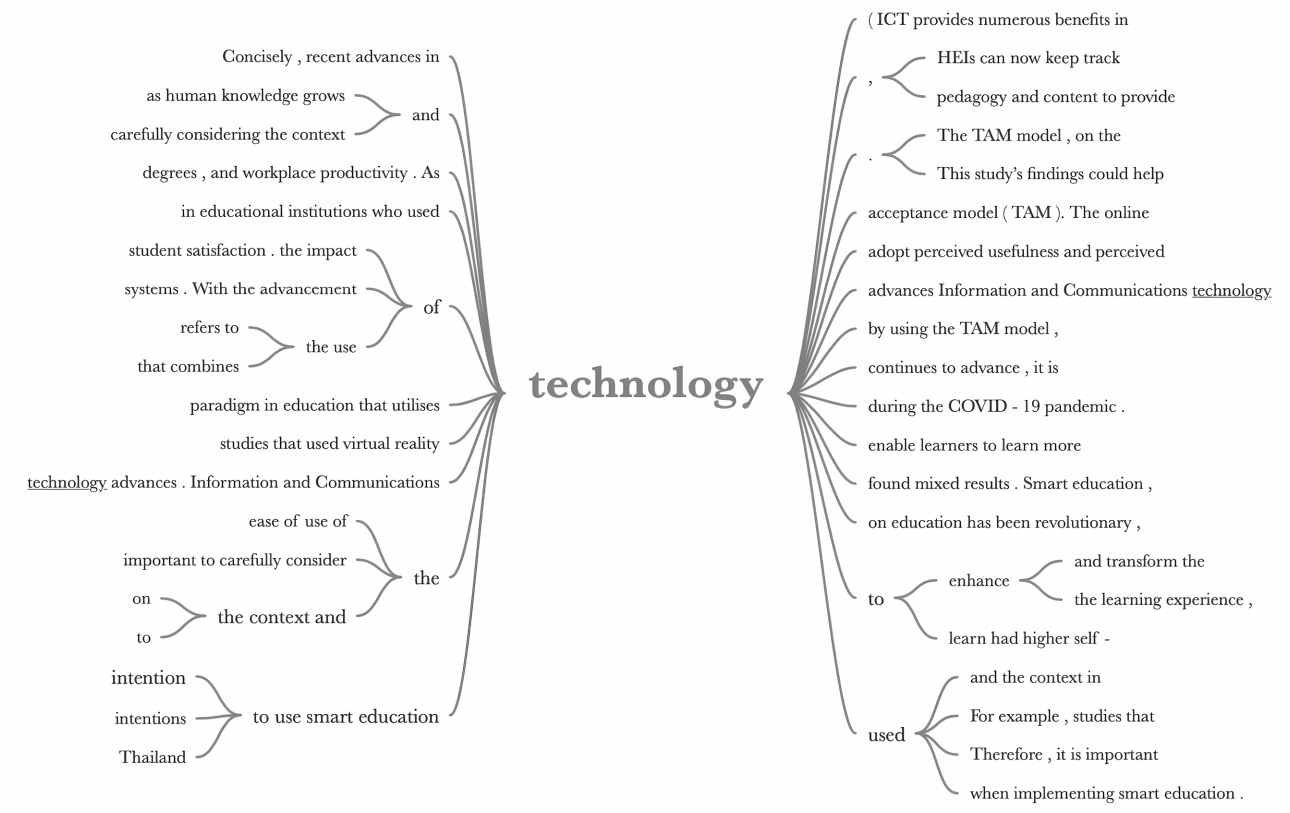

Figure 2. Word tree (technology).

6. E-Learning Economic Wise

We must delve deeper into the economic field in the issue of converting education to e-learning so we can say that school and university owners are the biggest beneficiaries of the shift to e-learning by providing electricity, workers, cleaning materials, gasoline, and diesel for buses and cars, air conditioning, and reducing the salaries of doctors, teachers, and workers, etc.

But e-learning threatens the field of investors in universities and schools, such as supermarkets, cafeterias, restaurants, and cafes.

- For Example: Restaurant Study Case

Before starting to activate e-learning, the cafeteria's sales and profits were as per Table 2 below.

Table 2. Before e-learning.

Day	Sales (Jordan Dinar)	Profit Rate 50%	Salaries	Rental	Net profit
Sat.	498	249	102	100	47
Sun.	476	238	102	100	36
Mon.	456	228	102	100	26
Tue.	462	231	105	100	26
Wed.	490	245	102	100	43
	Investor Net Profit Per Week				**178**

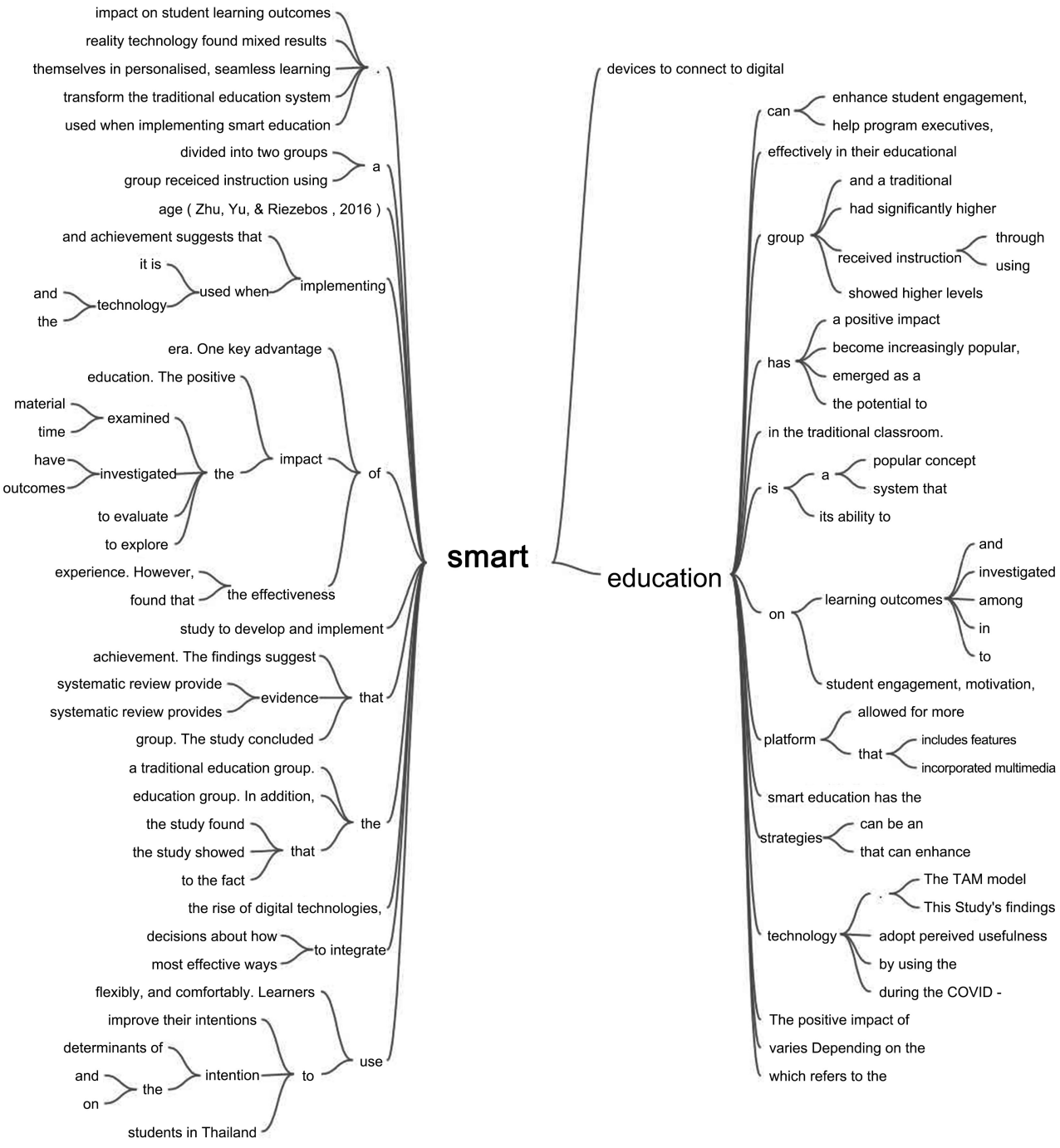

Figure 3. Word tree (smart education).

After starting the activation of e-learning, the cafeteria's sales and profits were as per Table 3 below.

By comparing the two tables, we can see the financial damage caused by the use of e-learning to the investor, but the bigger problem is that employees receive their salaries on a daily basis, and unfortunately, instead of receiving a salary for 5 working days, they now receive a salary for 4 working days, which has led to the employee being unable to cover his daily, personal and family needs.

Table 3. After e-learning.

Day	Sales (Jordan Dinar)	Profit Rate 50%	Salaries	Rental	Net Profit
Sat.	450	225	102	100	23
Sun.	424	212	102	100	10
Mon.	388	194	87	100	7
Tue.	440	220	105	100	15
	Investor Net Profit Per Week				**55**

In addition, in some countries, such as Jordan, for example, the transportation sector does not depend on government trains and buses, but rather, there is a strong private sector for buses and service vehicles that are negatively affected by the universities' reliance on e-learning.

7. Conclusion

The current trends in e-learning delivery have been presented, and it is clear that we must provide facilities that will help us take full advantage of the useful materials available freely on the Internet. The study has confirmed that cloud computing technologies can be leveraged to build the next generation of e-learning systems to deliver smart formal and informal learning. This set of technologies has clear potential to distribute applications across a wider range of devices, make educational services instant, smart, multi-sensory, seamless, and social, and significantly reduce the overall cost of computing.

This research has shown why it is important for academics to acquire the knowledge and skills that will enable them to transform their institutions into smart institutions. Based on the findings of numerous researches around the world, it is clear that most academics are not prepared to do so. The nature of work in both teaching, learning and administration has changed, and while old practices can be done more efficiently, technologies have allowed new practices to evolve.

But we must be careful about the harms of e-learning on the economy of the working class in society by creating new job and investment opportunities and reducing the unemployment rate in the country or the inability of employees to meet their needs in life.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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