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EFFECTS OF TECHNOLOGY INTEGRATION ON STUDENTS' LEARNING AT HIGHER EDUCATION LEVEL

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Abstract. *Information and communication are the two main powers of technology. Technology is essential for social interaction, business, and the economy, as well as for advancing education and meeting the needs of the contemporary information society. Both the quality and quality of instruction are enhanced by the application of technology in the classroom. Technology has a huge influence on higher education's teaching and learning processes since it facilitates both the instructional and learning processes. It makes learning more flexible, individualized, and asynchronous. It also moves the focus of learning from teachers to students, which serves as a catalyst for changes in the classroom, school system, community, and overall framework. It improves student learning, aids in the acquisition of new skills, fosters social mobility, prepares people for global competition, and has a multiplier impact on the entire educational system. The aim of this review research was to define the effects of technology integration on the students' learning at higher education level. To achieve the intended objectives of the study, a total of 9 previous published studies were searched on the different databases by defining the inclusion-exclusion criteria. The inclusion criteria were to select only those articles that were related to the impacts of integration of technology on the learners' learning at higher education level. The exclusion criteria were to select only those articles that have a relationship between the technology integration and students' learning at higher education level. Only those were selected that have full text accessed. The results of the study indicated that technology integration has a significant effect on the students' learning at higher education level. So, on the basis of findings of the research, it was recommended that technology must be the part of the learning process to improve the learning of the learners.*

Key Words: *Effects, Technology Integration, Students' Learning, Higher Education Level*

1. INTRODUCTION

Since information technology is a useful instrument for delivering education to its consumers, its integration is essential to current educational institutions. Technology is enhanced by education and research, which leads to advancements in teaching and learning strategies (Harrell & Bynum, 2018). Advanced technology has improved access to education, expanded its breadth, and sped up the learning processes (Backfisch et al., 2021).

Information systems are now being modified by educational institutions for use in teaching. Information systems are used in every area of education in one way or another (Dotong et al., 2016). Virtual classrooms, which offer instruction without teachers, are currently replacing traditional classrooms. The physical library has been converted into an online library, with conventional boards replaced by digital interactive boards. Access to information is getting simpler and more prevalent (Hartman et al., 2019).

Because of its significance, there is a need for ongoing study to examine how information technology should be integrated into educational institutions. Information technology integration assessment is a complicated activity that requires evaluating both direct and indirect elements. Asking consumers for input and examining how they are being affected by the technology is another method of evaluating these kinds of systems. The latter assessment technique is more adaptable and suitable for a wide range of IT systems (Ruggiero & Mong, 2015). Numerous research on the assessment of information technology and its effects on e-learning systems have been produced, based on this trend. The majority of these research

studies have covered techniques for defining important elements that influence e-learning tactics in order to create a productive online learning environment. Information technology instruments utilized in these instructional procedures are rarely assessed, hence their full potential is frequently underutilized (Liu, 2016; Silva et al., 2020).

The incorporation of technology shown encouraging outcomes in enhancing students' critical thinking abilities. Teachers' limited time in the classroom to cover in-depth topic knowledge and master learning goals makes imaginative use of technology a useful tool for fostering critical thinking. While many instructors focus on utilizing technology for websites, presentations, and administrative tools to improve current practice and promote classroom discussions, researchers highlighted the use of technology to encourage student inquiry, cooperation, and reformed practice. Using technology has been shown to improve pupils' questioning skills and promote thoughtful thought (Alghasab et al., 2020).

Objectives of the Study

The objective of this study was to determine the effects of technology integration on students' learning at higher education level.

Research Questions

What is the effect of integration of technology on the learning of students at higher education level?

2. LITERATURE REVIEW

Any educational institution that wants to integrate information technology must carefully plan and carry out this integration. Therefore, administration has a huge obligation to ensure that the cautious implementation of information technology integration in the classroom. This will enable educators and students to take use of the potential advantages that information technology systems may provide. The primary stakeholders utilizing this system must provide input in order to assess the degree of integration. both a pupil and an instructor (Pittman & Gaines, 2015; Parker et al., 2019).

It has been established that educational technology has a lot of potential to influence teaching and learning. Students' learning is stimulated and engaged, and it broadens their skill set and helps imitate professional experiences, preparing them for the demands of the job market. This transforms the educational setting, helps instructors by offering creative teaching resources, and establishes a connection between the school and the community (Liu et al., 2017).

According to Liao et al. (2021), technology promotes the development of skills needed for 21st-century jobs while also empowering instructors and students. ICTs enable students to freely and quickly explore, discover, create, interact with instructors, turn in assignments and receive feedback online, and initiate and participate in online conversations (Chaaban and Ellili-Cherif, 2017). In local and global communities, Alghasab et al. (2020) promoted the use of technology-mediated communication tools like teleconferencing and email to foster student collaboration across time and distance.

Kozma and McGhee (2003) gave instances of a peer-collaborative learning strategy in which students collaborate on specified tasks. He dubbed this technique "Student Collaborative Research Cluster." These instructional strategies contribute to the development of skills required by a society committed to long-term economic growth and social change, such as information management, teamwork and communication skills, interpersonal and self-directed abilities, and the ability to generate and creatively apply new knowledge to solve complex problems. In a similar vein, Simonson et al. (2003) stated that technology integration promotes collaborative learning. Several studies highlight the value of integrating technology into educational practices and suggest that doing so benefits both students and teachers in the process of learning (Tsai, 2015; Alghasab et al., 2020).

According to Yurtseven Avci et al. (2020), technology integration into the classroom increases teachers' pedagogical and content-area competence and facilitates students'

efficient use of technology. Numerous studies emphasized the benefits of technology use for educators. For example, Francom's (2020) study found that instructors who are proficient with technology would rather spend more time in the classroom. Teachers' performance is improved since their technical capabilities also make it easier for them to adopt different instructional pedagogies and methods. Vongkulluksn et al. (2018) stated that using technology in the classroom makes learning easier for students, but effective use of it often depends on the pedagogical and technological skills of the instructors.

According to research findings, using technology has a substantial impact on high-level thinking because it helps learners function at the synthesis, evaluation and analysis levels of Bloom's Taxonomy. Researchers looked at how a technology-rich classroom affected students' ability to learn as well as how well they developed higher-order thinking abilities. As a result, technology puts the learners at the center, enabling them to express their inner potential and enhance learning. Studies have also shown that instructional technology gives pupils additional learning opportunities and enhances critical thinking (Lee & Choi, 2017).

3. RESEARCH METHODS

Article Selection Process

The Prisma diagram was followed for the selection of the articles. Its procedure is discussed in the following lines:

i. Identification

a. Databases and Time Limit for Literature Search

The researchers searched the articles on the action learning theory and leadership development from January 2016 to November 2023 from the major electronic databases including ERIC, Web of Science, Google Scholar and Scopus. The key terms used for literature search for articles were: Technology Integration, Students learning, higher education.

b. Inclusion Criteria for Literature

The articles were included based on the following inclusion criteria:

- Only those articles were included that reported the action learning theory and leadership development. The studies that have no link between technology integration and students learning were excluded.
- The studies that were published in a peer reviewed journal, from the year 2016 to 2023 and written in English were included in the study. The studies that did not meet this criterion were excluded. So, initially 61 studies were identified.

ii. Screening

After removing the duplicate records of 22 studies, the remaining studies were 39 based on inclusion and exclusion criteria. Records excluded on the basis of the abstract review were n=12, not relevant n=9, and not in English n=2.

iii. Eligibility

The total full-text articles assessed for eligibility obtained were n=16. The full-text articles that have no link between technology integration and students' learning at higher education were also excluded n=7.

iv. Included

So, the final studies included in the review were obtained as n=9. The article selection process followed by the Prisma diagram is shown in figure 1.

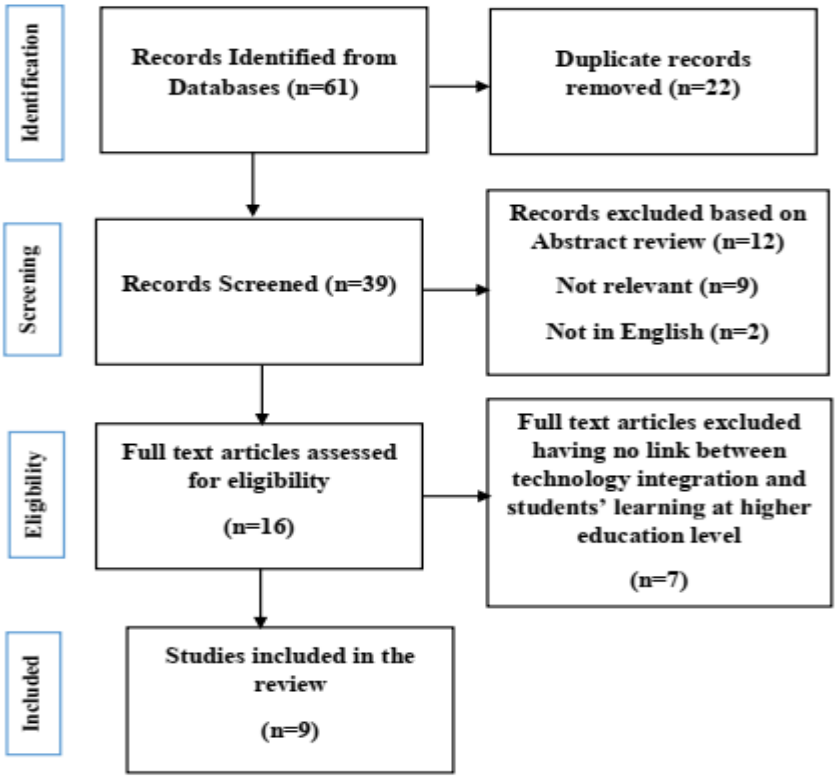

Figure 1: Prisma Diagram for the Article Selection Process

4. RESULTS AND DISCUSSION

The purpose of this review research was to investigate the impact of technology integration on student learning at the higher education level. The study question for this aim was: "What is the effect of technology integration on students' learning at the higher education level?" Previous research papers were analyzed in order to attain the targeted purpose and discover a response to the research question.

Effects of Integration of technology on Students' Learning at Higher Education Level

Several research studies were conducted to determine the impact of technology integration on students' learning at the higher education level. The findings of the research evaluated are shown in table 1.

Table 1: The findings of the studies reviewed

Sr. No	Reference	Methodology	Results
1	Robinson (2016)	Literature Review	The study's conclusions showed that integrating technology has significantly improved students' learning experiences.
2	Bicer and Capraro (2016)	Data Set	The study's findings showed that pupils' critical thinking abilities had significantly increased as a result of using technology into math classes.
3	Ismajli et al. (2021)	Questionnaire based	The study's conclusions showed that integrating technology into the classroom has enhanced its effectiveness while also raising students' performance and critical thinking skills.

4	Yilmaz (2021)	Quantitative Questionnaire	The study's findings show that adding technology into the classroom progressively enhances students' critical and creative thinking skills, as well as their academic achievement.
5	Hartman et al. (2019)	descriptive case study design	The study's conclusions demonstrated how integrating technology improved pupils' learning.
6	Hur et al. (2016)	Quantitative Questionnaire	The study concluded that incorporating technology into the teaching and learning process improved the educational system.
7	Raman et al. (2019)	Quantitative Questionnaire	The study's conclusions displayed that integrating technology into the classroom has enhanced its effectiveness while also raising students' performance and critical thinking skills.
8	Sulistiani et al. (2023)	structural equation modeling	The efficiency of the learning process and the learners both enhanced with the introduction of technology.
9	Nova (2017)	Quantitative Questionnaire	The study's conclusions demonstrated the great value of video in the teaching and learning process, particularly in terms of presenting the subject matter, enhancing students' prior knowledge, introducing real-world language context, offering visual and aural input, and facilitating a wide range of linguistic expressions.

Table 1 shows the results of the articles reviewed for this study. Table shows that most of the studies reviewed indicated that with the integration of technology improved the students' learning. The students' critical thinking and creative skills improved by using the technology in learning process. The students also achieved better academic positions by integrating the education technology in their learning process.

CONCLUSION

This review research sought to investigate the impact of technology integration on students' learning at the higher education level. Previous research found that integrating technology into the learning process boosted students' academic success, critical thinking, and creative skills. Based on the study's findings, it is advised that teachers employ appropriate technology to increase learning.

Conflict of Interest

No conflict of interest was found between the author/s.

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