



## UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN ONLINE LEARNING IN EDUCATIONAL INSTITUTIONS

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### ***Abstract***

The rapid development of Information and Communication Technology (ICT) has had a significant impact on various aspects of life, including education. Online learning, which utilizes digital technology for the teaching and learning process, has become an increasingly popular alternative in the digital era. This study uses a qualitative method with a case study approach. This research was conducted in an Educational Institution, with data collection techniques in the form of interviews, observation, and documentation. The results of the study indicate that, the Utilization of Information and Communication Technology (ICT) in online learning in Educational Institutions is carried out in various ways, such as: Online Learning Platforms, Learning Videos, Live Streaming and Video Conferences, Educational Applications, Digital Learning Materials, Use of Social Media, Online Evaluation and Online Counseling. Several factors that support the effectiveness of online learning in Educational Institutions include: Adequate ICT Infrastructure, Teacher Training, Adapted Curriculum, Interactive Learning Content, Technical and Administrative Support, Parental Participation, Effective Collaboration and Communication, Comprehensive Assessment, Flexibility and Differentiation and Continuous Evaluation and Improvement. There are several factors that can hinder the effectiveness of online learning in educational institutions, including: Limited access to technology, limited technological skills and knowledge, limited interaction and collaboration, technical disruptions and unstable internet connections, lack of student motivation and engagement, lack of support from parents or guardians, isolation and emotional well-being, inability to facilitate practical work or live demonstrations, lack of constructive evaluation and feedback, and inequality of access and opportunities.

**Keywords :** Utilization, ICT, Online Learning



## INTRODUCTION

A current global phenomenon is the development of various breakthroughs in the field of information systems. In real-world applications, the services provided by information systems are so diverse that no aspect of life and livelihood is untouched by information systems, whether at the individual, group, or organizational level, at the national level, or even in inter-organizational relationships, including educational institutions (Zabua et al., 2022: 646).

In education as a whole, two key questions arise: who are the users of educational products? This refers to education and the added value provided by those who process and benefit from educational outcomes. Education is a forum that addresses the stages of implementation that initially lead a person to culture. The cultural process improves a person's quality and dignity throughout life, occurring within the family, school, and community (Azmi et al., 2022: 85).

Information and communication technology (ICT) is a technology, both hardware and software, used to manage data/information and communication. In practice, technology is represented by computers (hardware) and application programs (software). Data/information is managed and produced in various media, such as text, graphics, still images, photographs, films, animations, and simulations. Communication methods can be conducted virtually (Gunawan, 2014: 1).

Educational technology is often confused with the term "instructional technology." Instructional technology is a subset of educational technology, based on the concept that instruction is part of education. In the future, the flow of ICT development will accelerate, demanding that humans adapt to these developments to stay ahead of the times and to face global challenges. Under these conditions,



Therefore, education cannot be separated from the internet, computers, and other ICT facilities as primary tools in the learning process. To utilize ICT to improve the quality of learning, three things must be realized: 1) Students and teachers must have access to digital technology within the educational institution. 2) The availability of high-quality and useful materials for teachers and students. 3) Teachers must have the knowledge and skills to use digital learning media to help students achieve academic standards and develop their potential (Siregar & Marpaung, 2020: 61).

Therefore, to achieve quality and improve the efficiency and effectiveness of learning, learning activities need to utilize ICT. In reality, many teachers are still not yet proficient and ready to use ICT in learning. Internet misuse by students is also a problem that needs to be addressed. Teacher capacity building is carried out through ICT training with Microsoft Office application materials for preparing lesson plans, learning media and assessing learning outcomes, in addition to the internet to enrich knowledge and communication. Socialization of healthy internet, cybercrime and the ITE Law is delivered to students to increase their insight into the importance of using the internet in learning and to avoid its misuse (Prayitno et al., 2018: 401).

The rapid development of information and communication technology (ICT) has brought significant changes to various aspects of life, including education. The advent of the internet and various digital devices has opened up new opportunities to improve the quality and access of education. Online learning, which utilizes digital technology for teaching and learning, has become an increasingly popular alternative in this digital era. While online learning offers many advantages, such as flexibility, accessibility, interactivity, and personalization, several challenges remain.



These challenges include limited access to technology, low digital skills among teachers and students, lack of social interaction, and low motivation to learn. Therefore, this study aims to determine how ICT is utilized in online learning in educational institutions and to identify factors that support and hinder the effectiveness of online learning in these schools. The objectives of this study are: 1). To find out how ICT is utilized in online learning in educational institutions, 2). To identify factors that support the effectiveness of online learning in educational institutions and 3). To identify factors that hinder the effectiveness of online learning in educational institutions.

## RESEARCH METHODS

This research on the use of Information and Communication Technology (ICT) in online learning in educational institutions will use a qualitative approach with a library research approach. This type of research was chosen based on the consideration that the focus of the study is to build a comprehensive, in-depth, and analytical understanding by exploring and synthesizing various concepts, theories, and previously existing empirical findings. Library research is considered appropriate because the purpose of the research is not to generate primary data in the field, but rather to analyze, critique, and reconstruct the latest knowledge scattered across various written sources to answer the research questions. The researcher acts as a connector and interpreter of the treasure trove of knowledge that has been codified by experts and previous researchers, so that it can produce a new, more complete and comprehensive construction of thought or conceptual model regarding the phenomenon of ICT use in online learning.

The data sources in this study come entirely from library materials, which are classified into three main types. The first is books,



Both textbooks and reference books discuss fundamental theories of educational technology, online learning design, digital learning psychology, and educational information systems management. These books provide a solid theoretical foundation and a systematic framework for thinking. Second, articles in scientific journals, both national and international, are indexed and reputable. Journal articles are selected because they present the most up-to-date, specific empirical findings and have undergone a peer-reviewed process, thus guaranteeing their academic credibility. These journals will include publications on case studies of ICT implementation, the effectiveness of specific learning platforms, factors influencing the success and failure of online learning, and the latest innovations such as the use of artificial intelligence and learning analytics. Third, research reports, which can take the form of theses, dissertations, or reports published by research institutions such as the Center for Educational Studies or international bodies like UNESCO and the World Bank. These reports often contain highly detailed data and in-depth analysis that may not be fully published in journals.

Regarding data collection techniques, the process will involve systematically searching and collecting written documents. The initial step is to develop a data collection guide containing search keywords such as "Technology-Enhanced Learning," "Online Learning Effectiveness," "Digital Pedagogy," "ICT in Education," "Learning Management System," and various combinations thereof. The search will be conducted through various channels, including online library catalogs (OPACs), trusted scientific journal databases such as Google Scholar, Scopus, ERIC, and ScienceDirect, and institutional repositories. Once the documents are collected, the techniques applied are close reading and content logging. Reading is not merely done briefly, but critically and repetitively to capture the essence, argumentation, methodology, and key findings of each source. Recording is carried out systematically, for example.



by creating a digital data card that summarizes the source identity (author, year, title), research objectives, methods used, main findings, and important quotes relevant to the research focus.

After data collection, this study will apply qualitative data analysis techniques using an interpretive content analysis model. The analysis does not stop at counting the frequency of word occurrences, but rather interprets meaning and identifies thematic patterns behind the collected texts. The process begins with data reduction, where researchers filter and focus on data that is truly relevant to the problem formulation, ignoring less significant information. The next stage is data display, where the reduced data is arranged in the form of a matrix, a conceptual relationship chart, or a narrative description that allows researchers to see the relationships between categories. The core stage is conclusion drawing and verification. At this stage, researchers synthesize various findings and theories from various sources.

Finally, to ensure the validity and credibility of the findings of this library research, several data validity testing techniques were applied. The first is a credibility test, which is carried out through source triangulation. In the context of library research, triangulation means comparing and checking the consistency of findings from various different data sources (books, journals, research reports) to build a cross-checked understanding and not rely solely on a single opinion. The second is a dependability test, which is achieved by conducting an audit trail. The researcher documents the entire research process in detail and transparently, from search keywords and inclusion-exclusion criteria for source selection, recording techniques, to the analytical steps taken. The third is a confirmability test, which emphasizes that research findings must be derived from the data collected, not solely from the researcher's prejudice or subjectivity. This is ensured by always including citations.

directly or indirectly from original sources to support any statements or conclusions drawn. Fourth is the transferability test, where researchers present rich, in-depth, and contextual descriptions of their study findings .

## **RESEARCH RESULTS AND DISCUSSION**

### **A. Research Results**

#### **1. Utilization of Information and Communication Technology (ICT) in Online Learning in Educational Institutions**

The use of Information and Communication Technology (ICT) in online learning in educational institutions is carried out in various ways, including:

- a. Online Learning Platform: Use of online learning platforms such as Google Classroom, Moodle, or special learning platforms provided by the school.
- b. Learning Videos: The creation and use of learning videos that can be accessed by students whenever needed, either in the form of video recordings of lessons or other learning resources.
- c. Live Streaming and Video Conferencing: Conduct live learning sessions via live streaming or video conferencing using applications such as Zoom, Google Meet, or Microsoft Teams.
- d. Educational Applications: Utilizing interactive educational applications that support the learning process, such as Khan Academy, Quizizz, or Kahoot.
- e. Digital Learning Materials: Provision of digital learning materials such as e-books, presentation slides, and other interactive learning materials that can be accessed online.

- f. Use of Social Media: Utilizing social media such as WhatsApp or Facebook groups for discussions, Q&A, and sharing information related to learning.
- g. Online Evaluation: Conducting exams and assessments online using a special platform or online exam application.
- h. Online Counseling: Utilizing technology to provide online counseling and guidance services to students.

The use of ICT in online learning has elements of flexibility and better accessibility for students and allows interaction between teachers and students without having to be in the same physical location.

## **2. Factors that Support the Effectiveness of Online Learning in Educational Institutions**

Some factors that support the effectiveness of online learning in educational institutions include:

- a. Adequate ICT Infrastructure: Availability and quality of ICT infrastructure such as a stable internet network, hardware (computers, tablets, or smartphones), and software that supports online learning.
- b. Teacher Training: Teachers who are skilled in using technology and have knowledge of effective online learning strategies can improve the quality of learning.
- c. Customized Curriculum: A curriculum specifically designed for online learning, taking into account student needs, learning objectives, and available technological capabilities.
- d. Interactive Learning Content: Interesting and interactive learning content can increase students' interest in learning and facilitate better understanding of the material.
- e. Technical and Administrative Support: There is a technical and administrative support team ready to assist teachers and students in overcoming problems .

technical issues and manage the online learning process smoothly .

- f. Parental Participation: Parental support in supervising and supporting their children's online learning can strengthen the effectiveness of learning.
- g. Effective Collaboration and Communication: Collaboration between teachers and students as well as open and effective communication can improve interaction and understanding in online learning.
- h. Comprehensive Assessment: Use of assessment methods appropriate to online learning, including online exams, project assignments, and portfolio-based assessments, to comprehensively measure student understanding and achievement.
- i. Flexibility and Differentiation: The ability to provide flexible and differentiated learning according to individual student needs can increase the effectiveness of online learning.
- j. Continuous Evaluation and Improvement: A continuous process of evaluating the effectiveness of online learning and making periodic improvements and enhancements can ensure more effective learning in the future.

### **3. Factors that Inhibit the Effectiveness of Online Learning in Educational Institutions**

There are several factors that can hinder the effectiveness of online learning in educational institutions, including:

- a. Limited Access to Technology: Not all students have adequate access to hardware such as computers or a stable internet connection , making it difficult for them to consistently participate in online learning.
- b. Limited Technological Skills and Knowledge : Students and teachers who are less skilled in using technology experience difficulties

in operating online learning platforms and utilizing the available features.

- c. **Limited Interaction and Collaboration:** Online learning tends to reduce direct interaction between teachers and students and between students, which can hinder the development of social and collaborative skills.
- d. **Technical Disruptions and Unstable Internet Connections:** Technical disruptions such as problems with the online learning platform, internet connection failures, or damaged hardware can disrupt the smooth learning process.
- e. **Lack of Student Motivation and Engagement:** Without direct supervision from teachers in the classroom, some students are less motivated to actively participate in online learning or do well on assignments.
- f. **Lack of Support from Parents or Guardians:** Low involvement of parents or guardians in supporting and supervising their children's online learning can hinder students' academic progress.
- g. **Isolation and Emotional Well-being:** Online learning can increase feelings of social isolation and loneliness in some students, as well as cause stress and emotional well-being issues that can interfere with focus and concentration on learning.
- h. **Inability to Facilitate Practical Work or Live Demonstrations:** Some subjects in Educational Institutions, such as practical or laboratory lessons, are difficult to adopt online due to the difficulty of providing facilities for practical work or live demonstrations.
- i. **Lack of Constructive Evaluation and Feedback:** The process of evaluating and feedback on student performance is less effective in online learning, especially if there is no adequate system to provide direct guidance and support.

- j. Inequality of Access and Opportunity: Not all students have equal opportunities to access online learning and its supporting resources, which can increase academic and social disparities among students.

## **B. Research Discussion**

In the world of Indonesian education, globalization has had an impact on the necessity of changing the teaching methods of teachers, which were previously traditionally paper-based, to now based on information and communication technology (ICT). The functions of ICT for teachers include, first, ICT can be used to assist administrative work (Word processor & Basic Level Compulsory Needs, Spreadsheets). Second, ICT can be used to help package teaching materials (Multimedia). Third, ICT can be used to assist the learning management process. Fourth, ICT can be used for technical support and increasing knowledge in order to realize self-running creation (antivirus, tools, networks, internet, etc.). Several types of ICT-based learning resources and media that can be utilized by teachers in elementary schools, include Computers or laptops, LCD (Liquid Crystal Display), Smart Television, Internet Network, E-mail (electronic mail), Power Point Presentations, learning CDs, and Smart phones. To improve their ability to utilize ICT, teachers need to continue to train and get used to ICT-based learning as often as possible. In addition, teachers need to take part in training to improve their knowledge in the field of ICT (Aka, 2017: 28).

The results of the above study also align with those of Euis Mukaromah, who stated that this research is motivated by the fact that people's lives are continually changing due to advances in science and technology, including education. The research method used in this study is descriptive with a qualitative approach. The data collection techniques used in this study are observation.

Interviews and documentation. Researchers sought information regarding the research problem descriptively obtained from sources, namely the principal of the madrasah, the head of the madrasah committee, the head of the computer laboratory, teachers and students. The data analysis technique used was descriptive narrative, with the flow: data reduction, data presentation and drawing conclusions. Data validity was carried out by triangulating respondents, methods and time. From the results of the research and discussion, it shows that the use of information and communication technology in the learning process at MTsN 4 Ciamis, although limited as a medium, source and evaluation of learning, students do not feel bored learning and stimulates students to be more enthusiastic in learning. In this case, media can overcome the limitations of students' experience, media can enable direct interaction between students and the environment, media can produce uniformity of observation, media can also instill correct and appropriate basic concepts. Media can arouse new desires and interests and media can control the pace of learning and provide a comprehensive experience to students from concrete to abstract things . This means that learning designed by including information and communication technology-based media can change students' attitudes so that they are more enthusiastic about learning (Mukaromah, 2020: 179).

The use of information and communication technology (ICT) in online learning can improve school quality by adapting to current developments. School quality improvement management is a method of quality improvement that focuses on the education within the school itself, applying a set of techniques, relying on the availability of quantitative and qualitative data, and empowering all school components to continuously improve the capacity and capabilities of the school organization to meet the needs of students and the community (Azmi & Ridha, 2019: 95).

According to Dewi Salma Prawiradilaga, in general technology is formulated as "technology is simply, the application of knowledge to solve problems or invent useful tools" As for the Wikipedia site, the free encyclopedia of technology is defined as, "... is the usage and knowledge of tools, techniques, crafts, system or methods of organization." From these two definitions, it turns out that technology is perceived as knowledge to solve problems in the form of equipment, techniques, crafts. In addition, technology also means a system or method of an organization. Based on the opinion above, technology is a human-created system that is used to provide various kinds of conveniences. The use of technology in the learning process in schools is currently widely used to assist teachers in carrying out their duties, one of which is as a medium and source of learning so that it is expected to increase students' enthusiasm for learning (Prawiradilaga, 2016: 15).

So, changes in learning patterns are very much needed to carry out renewal in a conventional learning system that is considered outdated and irrelevant to the dynamics of the development of the times that are developing increasingly quickly and intensively triggered by the development of science and technology. Information and communication technology in learning plays a role as a link in the implementation of knowledge transfer without completely eliminating the initial model of learning that takes place face to face in the classroom. The use of information and communication technology in learning is carried out in order to increase the effectiveness in the implementation of the learning process which is ultimately expected to improve student learning outcomes and the quality of individual students in terms of using technology more appropriately and usefully (Husain, 2014: 185).

## **CLOSING**

### **A. Conclusion**

The use of Information and Communication Technology (ICT) in online learning in Educational Institutions is carried out in various ways, such as: Online Learning Platforms, Learning Videos, Live Streaming and Video Conferencing, Educational Applications, Digital Learning Materials, Use of Social Media, Online Evaluation and Online Counseling. The use of ICT in online learning has elements of flexibility and better accessibility for students and allows interaction between teachers and students without having to be in the same physical location. Several factors that support the effectiveness of online learning in Educational Institutions include: Adequate ICT Infrastructure, Teacher Training, Adapted Curriculum, Interactive Learning Content, Technical and Administrative Support, Parent Participation, Effective Collaboration and Communication, Comprehensive Assessment, Flexibility and Differentiation and Continuous Evaluation and Improvement. There are several factors that can hinder the effectiveness of online learning in educational institutions , including: Limited access to technology, limited technological skills and knowledge, limited interaction and collaboration, technical disruptions and unstable internet connections , lack of student motivation and engagement, lack of support from parents or guardians, isolation and emotional well-being, inability to facilitate practical work or live demonstrations, lack of constructive evaluation and feedback, and inequality of access and opportunities.

### **B. Suggestions**

Based on the research findings, here are several recommendations to improve the effectiveness of online learning in educational institutions: 1) Expanding technology access for students from low- income families . This can be done by providing free technology devices and internet access to students in need. 2) Improving teachers' digital skills .

and students. This can be done by holding training and workshops on the use of ICT in learning, 3). Increasing social interaction between teachers and students. This can be done by using ICT platforms and applications that enable real-time interaction and increase student learning motivation. This can be done by using interesting and interactive learning methods and 4). Conducting regular evaluations of the effectiveness of online learning. This can be done using various evaluation methods, such as tests, questionnaires, and observations.

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