Information and Communication Technology System in Algerian Universities and Strategies for Enhancement - A Case Study of University of Mohamed Lamine Debaghine setif 02

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Abstract

This study investigates the current state of Information and Communication Technology (ICT) at the University of Mohamed Lamine Debaghine Setif 02, Algeria, focusing on aspects such as cloud computing utilization, software reliance, hardware infrastructure, communication technologies, and internet usage. Findings indicate varying degrees of ICT integration, highlighting opportunities for improvement. Proposed strategies include investing in cloud infrastructure, standardizing software usage, upgrading hardware resources, and enhancing internet connectivity. Implementation of these strategies aims to modernize the university's ICT system, fostering academic excellence and competitiveness.

Keywords

ICT system;
University of Mohamed Lamine Debaghine Setif 02;
Cloud computing;
Software reliance;
Technology enhancement.

نظام تكنولوجيا المعلومات والاتصال في الجامعات الجزائرية واستراتيجيات التحسين – دراسة حالة جامعة محمد لمين دباغين سطيف 02

ملخص

تبحث هذه الدراسة في الوضع الحالي لتكنولوجيا المعلومات والاتصالات (ICT) في جامعة محمد لمين دباغين سطيف 02، الجزائر، مع التركيز على جوانب مثل استخدام الحوسبة السحابية، والاعتماد على البرمجيات، والبنية التحتية للأجهزة، وتقنيات الاتصالات، واستخدام الإنترنت. تشير النتائج إلى درجات متفاوتة من تكامل تكنولوجيا المعلومات والاتصالات، مما يسلط الضوء على فرص التحسين، وتشمل الاستراتيجيات المقترحة الاستثمار في البنية التحتية السحابية، وتوحيد استخدام البرامج، وتحديث موارد الأجهزة، وتعزيز الاتصال بالإنترنت. ويهدف تنفيذ هذه الاستراتيجيات إلى تحديث نظام تكنولوجيا المعلومات والاتصالات بالجامعة، وتعزيز التميز الأكاديمي والقدرة التنافسية.

الكلمات المفتاحية

نظام تكنولوجيا المعلومات والاتصالات؛
جامعة محمد لمين دباغين سطيف 02؛
حوسبة سحابية؛
الاعتماد على البرمجيات؛
تعزيز التكنولوجيا

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I- Introduction :

The explosion of information, rapid technological advancement, and intellectual, social, and cognitive openness have led to the emergence of new needs for wide human sectors, most notably the strong desire for knowledge and uncovering the unknown. Consequently, the world today is experiencing an information revolution, where Information and Communication Technology (ICT) occupies a leading position. Dealing with ICT has become an inevitable necessity. Day by day, individuals' engagement with modern technologies, especially with the evolving developments, is growing, as these technologies have spread their influence across various sectors, permeating every aspect of life, including the higher education sector represented by universities.

Universities have not been distant from these technologies, especially considering that information is the essential foundation for scientific research. Higher education represents a fertile ground for the preparation and utilization of information resources and the use of modern technologies. This has impacted universities, which are now required to keep pace with technology on a wide scale, considering that the university has always held significant importance within any educational system, whether concerning the training of frameworks for deploying the knowledge needed by society, essential for scientific, economic, and social progress, or in shaping comprehensive development plans, as it is the primary tool for them. The university represents one of the most important pillars of development because it involves preparing specialized human competencies in various fields.

Scientific developments have led to the emergence of new technologies, most notably the Information and Communication Technology (ICT) system, which has become essential in our present time. It extends throughout historical epochs and is considered a priority for various systems in different universities worldwide. In this era, the role of Information and Communication Technology (ICT) is increasing in shaping the present and shaping the future of academic institutions. Thus, institutional environments locally, regionally, and globally must show increasing interest in ICT towards developing the reality of academic institutions. It should be dealt with as a source of production and a tool that effectively contributes to achieving the institution's goals.

The ICT revolution, which has transformed many economies to benefit from speed, efficiency, effectiveness, and qualitative improvement, all these advantages are achieved thanks to technology. Thus, Information and Communication Technology (ICT) has regained prominence, a term referring to the computer or a process of its operations, as in the automated use of information in administrative tasks. Communication technology, for example, includes fax machines or video conferencing.

From this perspective, the problem of the study arises, as it is not about being ahead of adopting this topic, but rather, many studies have addressed the field of Information and Communication Technology (ICT) on the one hand, and on the other hand, intellectual and human capital and investment methods through higher education and scientific education in Information and Communication Technology (ICT). Based on these data, Algerian universities found themselves obliged to enter the world of Information and Communication Technology (ICT) and work on activating it in their administrative and pedagogical environment, which can contribute to the development of professional and administrative efficiency on the one hand, and the advancement of the university to achieve the quality of higher education, which has become a key driver of comprehensive development. Thus, we aim to uncover the reality of the Information and Communication Technology (ICT) system in Algerian universities, focusing on the case study of the University of Mohamed Lamine Debaghine setif 02. Hence, the main question arises: **What is the reality of the Information and Communication Technology (ICT) system at the University of Mohamed Lamine Debaghine setif 02**

Within this main question, several sub-questions are included:

1- To what extent is cloud computing employed at the University of Mohamed Lamine Debaghine setif02?

2- How much reliance is placed on modern software at the University of Mohamed Lamine Debaghine setif 02?

3- What are the main hardware devices relied upon by the University of Mohamed Lamine Debaghine setif 02?

4- What are the communication technologies employed by the University of Mohamed Lamine Debaghine setif 02?

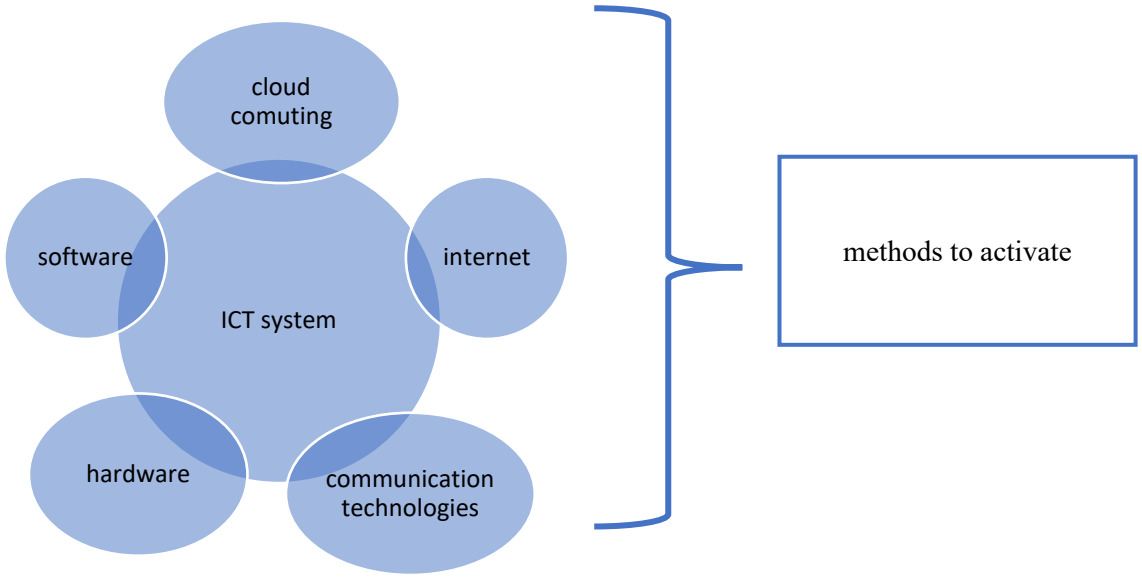
5- What is the scope of internet usage at the University of Mohamed Lamine Debaghine setif 02?

6- How can the Information and Communication Technology (ICT) system be activated at the University of Mohamed Lamine Debaghine setif 02?

1- Study Objectives and Significance:

a. **Study Objectives**: The main objective of this study is to understand the reality of using the Information and Communication Technology (ICT) system in Algerian universities, including its various elements, on the one hand, and to identify the barriers to effective use of Information and Communication Technology (ICT), on the other hand. This can be achieved through the following specific objectives:

- Understanding the extent of cloud computing employment at the University of Mohamed Lamine Debaghine in setif 02
- Understanding the reliance on modern software at the University of Mohamed Lamine Debaghine setif 02
- Identifying the main hardware devices relied upon by the University of Mohamed Lamine Debaghine setif 02
- Understanding the communication technologies employed by the University of Mohamed Lamine Debaghine setif02
- Exploring the scope of internet usage at the University of Mohamed Lamine Debaghine setif02
- Addressing the methods to activate the Information and Communication Technology (ICT) system at the University of Mohamed Lamine Debaghine setif02



Source: by the researcher.

b. Significance of the Study:

- Information and Communication Technology (ICT), relying on cloud computing and software, has significantly advanced in universities.
- Organizations have become dependent on communication technologies and the internet to perform their tasks and manage their operations efficiently.
- Monitoring the key data related to the Information and Communication Technology (ICT) system within a vital field, namely higher education and scientific research, especially focusing on the Algerian university (University of Mohamed Lamine Debaghine setif02 is essential due to the significance of the university and its role in influencing society.
- The ability of the Information and Communication Technology (ICT) system to provide information and consequently manage activities and organize relationships through databases and effective communication tools to perform these tasks in the best possible manner and efficiently.

2- Study Concepts:

Concepts represent the core of the scientific methodology upon which all knowledge is based, despite the differences and variations among researchers regarding them. This study relies on a set of concepts and terminologies that we will define procedurally according to their meaning in our study. The concepts in our study include:

- **Technology:** Etymologically, "technology" is derived from the Greek word "techne," meaning art or craft, and the Latin word "logos," meaning science or study. Therefore, "technology" implies the art or science behind crafting or making something. In contemporary usage, technology has garnered significant attention, becoming a focal point for various institutions worldwide.

The term is often associated with mechanization, which involves the production of goods and services using machines.[1]

- **Communication Technology:** Communication technology refers to the accumulated knowledge, experiences, tools, and material means used to gather, process, store, retrieve, publish, exchange, and share information with individuals and groups.[2]

It encompasses various communication methods, both wired and wireless, essential for transmitting information from its storage location to its intended recipients.

Communication technology includes both hardware and software components facilitating information transfer through various media forms like text, sound, images, motion, and color, enabling interactive mass and personal communication.[3]

- **Information and Communication Technologies (ICTs)**: ICTs refer to the integration of computer technology with wired and wireless communication technology, including microelectronics and multimedia capabilities. This integration enables unprecedented capabilities in producing, gathering, storing, processing, disseminating, and retrieving information through interactive mass and personal communication channels.

Some researchers differentiate between Information Technology (IT) and Communication Technology, where IT focuses on computer systems' automated use in information management, while Communication Technology includes fax machines and video conferencing.[4]

- **University:** Etymologically, "university" originates from the Latin word "universitas," meaning a community or corporation, which initially referred to a guild or corporation of scholars.

Functionally, a university is an independent academic institution with a defined organizational structure, academic customs, and traditions. Its primary functions include teaching, scientific research, and community service.

A university comprises faculties and departments specializing in various scientific disciplines, offering diverse study programs at undergraduate and postgraduate levels, leading to academic degrees.[5]

3- Previous Studies:

Previous studies in scientific research are undoubtedly the expansive field that allows us to understand the subject and benefit from the findings of previous researchers, which serve as a fundamental basis for subsequent research. Previous studies are defined as those that "refer to studies that have examined the same specific field of the problem being studied by the researcher, thereby representing, for the posed problem, an initial knowledge base, and directly contribute to the results of previous studies."[6]

- The first study by **Faten Tabet**: Title: "Distance Learning in Tunisia: A New Evolving University System" Institution: Université Stendhal, Grenoble, France, 2010 this study surveyed the use of information and communication technology (ICT) in the Tunisian educational sector, focusing on its integration and necessity. The study found that ICT significantly facilitated productivity in classrooms and fostered pedagogical relationships, though challenges in organizing ICT devices were primarily noted in literary studies departments.
- The second study by **Houriya Belaouidat**: Title: "The Use of Modern Communication Technology in Algerian Economic Institutions: A Field Study at Sonelgaz Gas Transmission Network Management Branch in Constantine, 2007-2008" Degree: Master's Thesis This study aimed to assess the actual use of modern communication technology and the factors influencing its use in the performance of the studied institution. Results showed that communication technology had a significant impact on the economic institution's performance, enhancing its efficiency.
- The third study by **Zelmat Meriem**: Title: "The Role of Information and Communication Technology in Knowledge Management within Algerian Enterprises: A Case Study of Sonatrach, 2009" Degree: Master's Thesis This study investigated the contribution of ICT to knowledge management within the enterprise. Results indicated that ICT had a significant impact on knowledge management, contributing to its development within the enterprise.
- The fourth study by **David Thomas**: Title: "An Information Systems Design Theory for E-learning" Degree: Doctoral Thesis This thesis aimed to address the problem of designing and preparing information systems primarily to support e-learning projects in universities. Results included identifying the e-learning systems used at the Australian university, their characteristics, and formulating alternative approaches to tackle challenges faced by the institution in e-learning.

- The fifth study: "Future Perspectives on the Use of Information and Communication Technology in Educational System Development"Journal of An-Najah University for Research - Volume 24, Issue 3, 2010 This study analyzed the five elements of the educational system: the teacher, the student, the curriculum, leadership or management, and the teaching process. It emphasized the necessity of using ICT to improve the quality of education and the other elements of the educational system. The study concluded that ICT positively impacts all aspects of education, contributing to human resource development capable of utilizing, developing, and creating knowledge effectively.

4- Study Type and Methodology:

Each study necessitates reliance on a clear scientific methodology to be considered scientific, and we can trust its results. Based on the discussed subject of information and communication technology (ICT) systems in Algerian universities and ways to activate them, the study can be classified as a case study. This type of study focuses on researching events, phenomena, situations, and opinions, analyzing them, and interpreting them to reach the facts.

Researchers are not free to choose their methodology for their research topic; rather, the topic dictates the type of methodology to be used. Not every methodology is suitable for studying any topic; rather, each methodology suits a specific type of study. The methodology is defined as "the method followed by the researcher in studying the problem to explore the truth and answer the questions raised by the research topic, determining the path to reaching those truths and ways of discovering them."[7]

In this study, we relied on the case study methodology to analyze and understand the phenomenon of information and communication technology and its relationship in facilitating administrative communication.

Case Study Methodology: This methodology focuses on studying, understanding, and analyzing all aspects related to identifying individual phenomena and cases. The researcher identifies the phenomenon or problem of the study and generalizes the results to similar cases.

Moreover, case study methodologies are concerned with identifying aspects related to a particular phenomenon and understanding the characteristics of the cases, which may include individuals or groups. We chose the case study methodology because it is most suitable for studying this phenomenon as it examines the relationship between information and communication technology and administrative communication. This methodology aligns with the study's objectives and allows us to obtain all the information specific to the phenomenon, as well as quantitative data that answers the study's main question.

5- Data Collection Tools:

The success of any scientific research is linked to the effectiveness of the tools used to collect data. Researchers use various methods and tools to collect information about the research problem, answer its questions, or examine its hypotheses. It is essential for the researcher to decide in advance on the appropriate method for their research and be familiar with the various tools and methods for collecting information for scientific research purposes.

The researcher should choose the appropriate tool for data collection, and it is advisable for them to use more than one tool in their research. Data collection methods and tools are numerous and varied, but they are used individually or collectively depending on the nature of the studied phenomenon.

- **Interview**: This is one of the basic tools used by researchers to collect information and data about the studied phenomenon. It is considered one of the most common and effective data collection methods for obtaining necessary data for any research. The interview is not simple but rather a technical matter.

In our study, we relied on interviews in the applied aspect of the study since our research is fieldwork based on collecting information from the study sample. Additionally, the study addresses the information and communication technology system in Algerian universities and ways to activate it, which necessitates approaching the study sample represented by the University of Setif-2 within the specified time frame for the research to conduct interviews aimed at providing clarifications. Therefore, we relied on interviews where open-ended questions will be posed to the respondents to elaborate on their views and ideas regarding the phenomenon under study.

- **Interview Guide**: Interview guide axes:

A- Personal information of the respondent

B- Cloud Computing at Mohammed Lamine Debaghine University Setif 02

C- The extent of reliance on modern software in Mohammed Lamine Debaghine University Setif 02

D- Important hardware devices used by Mohammed Lamine Debaghine University Setif 02

E- Communication technologies relied upon by Mohammed Lamine Debaghine University Setif 02

F- The scope of Internet usage at Mohammed Lamine Debaghine University Setif 02

G- Ways to activate the information and communication technology system at Mohammed Lamine Debaghine University Setif 02

6- Study Population and Sample:

The research population refers to a specific or unspecified group of individuals who constitute the subject of the research problem and the related elements that the researcher seeks to generalize the results to. Determining the research population is one of the most important methodological steps in media research, requiring meticulous accuracy. The success of the research design and its effectiveness depend on it. In our study, the research population is the Algerian university. Usually, researchers resort to using a sample in scientific research, where the sample is defined as the research community from which field data is collected. It is considered a part of the whole, meaning that a specific group of individuals from the original community is selected to represent the community for the study, and the study's results are then generalized to the entire community.

In the context of completing the methodological framework of the work, it was necessary for us to determine the study sample, which the study will be applied to, and which is suitable for the nature of this study. This is Mohammed Lamine Debaghine University Setif 2, which serves as a model for the study of the information and communication technology system in Algerian universities and ways to activate it.

2- The theoretical framework of the study:

- **The Nature of Information and Communication Technology and Its Role in Higher Education**

The significant advancements in information technology have led to the transition from a classical economy to a digital economy that relies on information as a resource. Through information technology, organizations can achieve their set objectives and enhance innovation by introducing fundamental improvements in business processes and administrative strategies in line with modern technology.

Information technology has become a powerful force influencing various aspects of life, including organizations. The operations and activities of an organization largely depend on the volume and quality of available information. Without modern and advanced methods and techniques, an organization cannot gather, store, analyze, disseminate, and utilize information effectively. Thus, the importance of information technology as an essential part of various organizational activities and functions becomes apparent.

- Information and Communication Technology System in the University

The twenty-first century witnessed a qualitative leap in the field of communication and information technology. Due to its significant importance and the inevitable necessity of expanding the use of these technologies, they have permeated most fields and sectors, including scientific, social, political, economic, and service sectors. Therefore, in this section, we will attempt to address and provide an overview of modern communication technology, highlighting its concept as well as the most important areas of its application.[8]

- Origins and Evolution of Information and Communication Technology

Information technology has undergone several key historical stages, including:[9]

First Stage: This stage involves the invention of writing and human knowledge of it. The emergence of writing marked the end of the era of oral information, which ended with the death of an individual or a decline in their mental abilities.

Second Stage: This stage encompasses the emergence of printing in Germany in the mid-fifteenth century in its various forms and developments. Printing helped disseminate information and connect us through the proliferation of publications.

Third Stage: This stage involves the emergence of various types and forms of information sources, such as auditory and visual sources like telephones, radios, televisions, discs, audio tapes, and wireless communication.

Fourth Stage: This stage involves the invention and development of computers through their various generations, along with all their features, benefits, and positive impacts on information transfer through communication channels associated with computers.

Fifth Stage: This stage entails the significant convergence between advanced computer technology and various types and directions of communication technology, achieving the possibility of transmitting vast amounts of data at high speeds regardless of time and place, leading to information networks and culminating in the internet.

- Concept of Information and Communication Technology in the University

It encompasses all advanced technologies used to transform data in various forms into information of various types, utilized by beneficiaries in all fields.

The expansion of information technologies and communication techniques, especially in the first two decades of the 21st century, has had positive repercussions on the global society as a whole. The world has become a small village due to a combination of factors under the umbrella of globalization. The function of these technologies has become evident and tangible in advancing humanity collectively towards progress.

According to the Macmillan Dictionary of Information Technology, it is the possession, processing, storage, and transmission of information, visual and digital, through a combination of electronic computing and wired and wireless communications, based on electronics.[10]

Dr. Mohamed Fathi Abdel Hadi defines it as the search for the best means to facilitate access to information, exchange it, and make it available to seekers quickly and effectively.

- ## Benefits of Using Information and Communication Technology in the University

The benefits of applying information and communication technology in the university include:[11]

- **Vitality of Learning:** Information and communication technology provides students with an interactive learning environment that encourages their engagement in the educational process through the use of modern IT tools.
- **Increased Student Achievement**: Information and communication technology tools provide students with multiple and diverse sources of information, effectively strengthening the educational process. Studies have shown that some students learn better when using auditory or visual resources.
- **Development of Higher-Level Thinking Skills**: Utilizing modern technological methods in education can strengthen higher-order thinking skills. Some software is specifically designed to encourage and develop students' skills in gathering, organizing, analyzing, and using information to solve real-life problems.
- **Individual Differences Consideration**: Students learn and develop in different ways and at varying rates. Information and communication technologies can assist students in self-paced learning, allowing them to progress at a suitable pace in a safe environment. Additionally, they can change the teaching approach from whole-class instruction to small group or individualized learning.
- **Motivation:** Motivating students and stimulating their motivation poses a challenge in education using conventional methods. Information and communication technology can make learning various subjects a fascinating process for both students and teachers. Students using technological methods in learning show increased motivation and self-confidence.
- **Development of Collaboration and Group Work Skills:** Modern information and communication technology tools and methods provide an essential tool for fostering collaboration and teamwork among students and teachers, as well as among students themselves. These tools offer students in small and large groups multiple resources for gathering, analyzing, presenting, using, and transmitting information over long distances, fostering collaborative work skills.
- **Development of Communication Skills and Training Students in Information Literacy**: Information and communication technologies possess numerous tools and applications capable of developing students' communication skills. This includes embedding communication means in curricula through designing and disseminating study materials in the form of internal computer networks over long distances. Additionally, information and communication technologies have a high capacity for storing, retrieving, processing, and transmitting data in various forms, contributing to training students in retrieval, broadcasting, and processing information skills, enabling them to keep pace with the ultra-fast information highway.
- **Education from Multiple Cultures:** Modern information and communication technology can transcend classroom boundaries, connecting students and teachers in exchange relationships at both local and global levels. It also allows them to interact with other societies and to form a global national spirit towards certain issues.

Due to the importance of information technology, it will be defined on the benefits of technology for human resources management, including:

- Development and training of managers, employees, and investors in technology.
- Reduction of administrative staff and costs.
- Expansion and enhancement of the communication network and innovation of new methods.
- Adaptation and adjustment to variables due to the speed of knowledge.
- Sorting new and advanced management patterns.
- Improving performance.

- Increasing the organization's value through innovation and improving performance in the product or service provided.
- Efficient decision-making.
- Developing work in clear systems and specific methods.
- Developing positive behavior for organization members.

- Areas of Using Information and Communication Technology in the University

The applications of information and communication technology have varied, encompassing all fields, due to the urgent need and technological inevitability to keep pace with the development and change in patterns, behaviors, and uses of technologies available in the field of communication and information technology. Some of the most important applications and areas of use of these technologies are as follows:

- Digitally Controlled Machines: These are devices that have replaced human labor in production. They appeared at the beginning of World War II but did not see their true development until they became associated with electronics.
- Robotics: With the development of electronics and the emergence of silicon chips, these machines evolved into robots capable of performing complex and extremely rapid movements that humans cannot perform with the same efficiency.
- Computer-Aided Design: This technology has revolutionized design offices, allowing the visualization of a physical model before it is completed. This technology has enabled what is known as the economy of designs, as many designs can be completed in the shortest time possible and at the lowest cost.
- Artificial Intelligence: To some extent, humans have achieved their dream; now computers can read, recognize objects, speak, and give each problem a solution. Humans would not have been able to achieve this result without the development of software, leading to the emergence of expert systems.
- Virtual Education: Information and communication technology is considered a fundamental infrastructure and a tool to support virtual education, facilitating access to it at a reasonable cost. It has also benefited isolated areas in delivering education to them.
- Electronic Media: Media that relies on technological communication channels in connecting and providing the public with news and information, sharing common principles and goals with public media.

- The impact of Information and Communication Technology (ICT)

The impact of the Information and Communication Technology (ICT) revolution on the higher education system is significant. ICT is considered the contemporary tool that keeps pace with the rapid developments in the environment, influenced by several factors or determinants that need clarification and attention for the appropriate adoption of technology to suit the institution's context. This is essential to avoid its negative effects, seize opportunities, and achieve positive outcomes. Institutions must also avoid limitations that hinder the attainment of set objectives.

The use of ICT in higher education, whether in-person, remote, or hybrid, has resulted in the emergence of several positive variables. These variables are represented in various forms of remote support, stemming from the positive impact of ICT usage in higher education. They include:[12] Remote accompaniment: This involves defining, describing, and emphasizing the dimensions of the role of the facilitator and forms of facilitation, extending beyond academic and library-related processes to encompass students' psychological, social, and material aspects.

Le Clercq et al. (2009) distinguish between two types of accompaniment: communicative and educational. Communicative accompaniment involves specialized collaboration and assistance in study endeavors, while educational accompaniment assumes diverse forms. Remote accompaniment takes various forms, such as reception accompaniment, entry-close accompaniment, information and reception accompaniment, follow-up accompaniment, documentary accompaniment, and multimedia accompaniment.

Furthermore, remote collaborative work represents a new form of training that necessitates a specialized approach, combining pedagogy and ICT. Pedagogy plays a role in aiding and encouraging training development and ensuring participant engagement and integration, while ICT facilitates the creation of an environment aligned with pedagogical objectives. This requires a specific simplification model, particularly regarding student-teacher relationships, considering acquisition procedures and knowledge production within the context of the "social construction of knowledge."

Present and describe the study results.

Firstly: Study Results:

Our research raised several questions and hypotheses related to the nature of the relationship and the role between Information and Communication Technology (ICT) and the quality of higher education. Through this, we arrived at several results that contributed to solving the research problem and answering its questions and hypotheses. Below are some of the most prominent results, categorized into theoretical and field study outcomes.

- Field Study Results:

The field study yielded several important results, including:

- Mohammed Lamine Debaghine University - Setif 2 does not possess its own cloud computing infrastructure.
- The university has a considerable number of ICT-related devices and equipment but insufficient, including computers, printers, and data projection devices. It also updates and upgrades these devices regularly.
- The university possesses computer software and other software in progress for various applications, along with automated security systems to protect university data.
- The university has internet networks reaching all faculties, facilitating its operations, and has electronic links between the university, professors, students, and the Ministry of Higher Education and Scientific Research.
- Mohammed Lamine Debaghine University - Setif 2 has an important database of faculty members, students, and staff.
- The university has taken crucial steps to enhance data security in cloud computing to minimize risks associated with data breaches or access, relying on data encryption techniques and data backup to preserve it.
- Mohammed Lamine Debaghine University - Setif 2 relies on cloud-based applications such as Progress system, Moodle system, Google Workspace, and storage applications like Dropbox and Google Drive.
- The university utilizes the internet for various services like remote visual lectures, distance learning, and registration, but these services are not always stable.

Secondly: Final Results:

In conclusion, the final results of our study are as follows:

- Mohammed Lamine Debaghine University - Setif 2 employs cloud computing, but not as its exclusive system, which imposes limitations and challenges regarding storage and data processing speed.
- The university relies on modern software like Progress and Moodle systems and virtual conference tools like Zoom to support its administrative and pedagogical efforts.
- Mohammed Lamine Debaghine University - Setif 2 uses medium-quality hardware devices but aims to develop them to ensure network speed, reliability, and quality enhancement.
- The university relies on digital platforms approved by the competent ministry and professional email to facilitate communication.
- The internet usage scope at Mohammed Lamine Debaghine University - Setif 2 is weak compared to developments, hindering learning experiences, communication, and collaboration within the institution.
- The university lacks an official website, hindering electronic communication flow.
- Mohammed Lamine Debaghine University - Setif 2 aims to activate the ICT system and integrate it into various colleges and departments, facing several obstacles such as lack of technical expertise and training among staff and financial constraints.

Thirdly: Ways to Activate ICT System:

Based on the study's findings, the following suggestions are proposed as means to activate the ICT system effectively:

- The university should establish contracts with companies to invest in ICT and not solely rely on the ministry.
- Emphasis should be placed on human resources by focusing on hiring qualified talents needed to increase the effectiveness of the systems to keep up with developments in ICT.

- Fostering a culture of quality within the university community, including faculty members, administrative staff, and students, by providing necessary support and resources.
- Continuous improvement principles should be implemented in all areas related to quality education to address discovered weaknesses and elevate strengths to keep pace with continuous scientific advancements.
- Improving the density of network flows in all its forms (internet, extranet, intranet), linking all higher education institutions with their faculties and departments via the internet as it is the cornerstone for other networks.

Conclusion

After examining the theoretical aspects of both Information and Communication Technology (ICT) for quality higher education, the importance of achieving institutional effectiveness becomes apparent as a primary goal pursued by higher education institutions. It has become clear that achieving institutional effectiveness depends primarily on several approaches, among which effective utilization of ICT stands out as a modern necessity.

The practical chapter of our study focused on investigating the role played by the Information and Communication Technology (ICT) system in achieving quality higher education at Mohammed Lamine Debaghine University - Setif 2. To achieve the outlined objectives, it was necessary to test its hypotheses and answer various questions through the application of interview methods to familiarize with the subject and provide a comprehensive overview of the status and effectiveness of the ICT system at the university.

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