

Assessment of Information Technology Dimensions in the Algerian University: An Applied Study at the University of May 8, 1945 – Guelma

Nesrine Salah ¹

¹ Laboratory of Self-Development and Good Governance, University of May 8, 1945 – Guelma (Algeria),
Salah.nesrine@univ-quelma.dz

ARTICLE INFO

Article history:

Received:10/07/2025

Accepted:29/11/2025

Online:28/02/2026

Keywords:

Information Technology

Professors

University of May 8,
1945 – Guelma

Electronic

Questionnaire

SPSS Analysis

JEL Code: I23, O33,
C83.

ABSTRACT

The abstract This study aims to assess the dimensions of Information Technology at the University of May 8, 1945 – Guelma, by surveying a random sample of 288 permanent professors. The data was collected using an electronic questionnaire and analyzed with SPSS V.20. The results revealed a moderate level of information technology utilization at the university, reflected in an average evaluation of hardware resources, software, and data. In contrast, communication networks and human competencies received lower ratings. These findings indicate a relative imbalance in the university's digital infrastructure, which weakens the efficiency of leveraging available technological capabilities. Accordingly, the study recommends the academic and technical qualification of human resources through continuous training programs, along with the updating and strengthening of communication networks to ensure a more stable and effective digital environment that supports the needs of higher education and scientific research.

1. Introduction

In recent decades, the world has witnessed fundamental transformations that have reshaped the business environment, driven by scientific and technological advancements that have revolutionized various sectors. Information has become a strategic resource no less important than traditional factors of production, making it a foundation for wealth creation and competitiveness, especially amid the accelerating pace of global changes. The integration of information with Information Technology has led to a qualitative leap in the production and dissemination of information, as the digital revolution has eliminated temporal and spatial barriers, making real-time access to information a critical factor in institutional success. The adoption of Information Technology is no longer a matter of choice but a vital necessity to keep pace with rapid developments. It serves as an effective tool for enhancing competitiveness, supporting innovation, and reinforcing an institution's market position.

In this context, the integration of Information Technology is no longer a luxury but has become a fundamental requirement for developing the administrative and operational infrastructure of institutions. This technology has contributed to reshaping managerial and organizational concepts and has enabled institutions to adapt to an environment characterized by uncertainty and constant change. Higher education institutions have not remained isolated from these transformations. It has become essential to integrate Information Technology into all university activities to improve the quality of academic, research, and administrative outputs and to achieve higher levels of efficiency and effectiveness.

Based on this, the central research problem addressed in this study can be formulated as follows: **What is the level of Information Technology evaluation at the University of 8 May 1945 – Guelma?**

To answer this question, it has been broken down into several sub-questions, including:

What is the level of evaluation of hardware resources? How are software resources assessed? How effective are the data-related resources? What is the performance level of communication networks? In addition to evaluating the availability and effectiveness of specialized human resources in the field of Information Technology at the university.

In light of these questions, a **main hypothesis** has been proposed: the level of Information Technology evaluation at the University of 8 May 1945 – Guelma is expected to be moderate. From this **general hypothesis**, several sub-hypotheses were derived, assuming that the evaluation of hardware resources, software resources, and data resources at the university falls within a moderate level. Similarly, the performance of communication networks and the availability of specialized human resources are also expected to be at the same level, which may reflect structural and organizational challenges that need to be addressed.

The significance of this study stems from the need to understand the reality of Information Technology in the Algerian university environment, particularly in light of the challenges faced by universities in their efforts toward digital transformation and achieving quality in educational and research outcomes. **This research aims to** provide a clear theoretical framework for the concepts of Information Technology and to analyze the current situation at the University of 8 May 1945 – Guelma through a field study based on the perspectives of faculty members as primary users of this technology. It also seeks to offer practical suggestions that contribute to enhancing the efficiency of Information Technology and achieving its optimal use within the university.

The content of this research is organized into two main parts: the first part addresses the theoretical and conceptual framework of Information Technology, while the second part focuses on the applied reality of Information Technology at the University of 8 May 1945 – Guelma, through the analysis of field data aimed at diagnosing the current situation and proposing actionable and practical solutions.

2. Theoretical Framework of the Study

This part of the study presents the theoretical framework that enables a comprehensive understanding of the foundational knowledge of Information Technology (IT). It focuses on the concept of IT, its core components—primarily its infrastructure—and its significance within the university context, covering three main domains: higher education, scientific research, and university administration.

2.1 The Concept of Information Technology

Information Technology is considered a central concept in modern business environments, serving as the backbone of administrative and operational activities within institutions. Researchers have differed in their definitions and approaches to IT, depending on their academic backgrounds and perspectives. This has resulted in a variety of complementary definitions that highlight the multifaceted nature of the concept.

From a holistic perspective, ([Fahmi Ibrahim, 2020](#)) defines Information Technology as a set of resources and technologies used to collect, store, process, and transmit information within an organization. These functions contribute to improved communication, support decision-making, and help achieve competitive advantage. He also emphasizes that IT is a fundamental component of the modern organizational structure due to its significant role in enhancing administrative efficiency and effectiveness.

From a technical standpoint, Efraim Turban defines IT as consisting of hardware, software, networks, and databases that work integratively to store, modify, retrieve, and provide data and information in support of various managerial levels ([Aldhmour, 2019](#)). This definition underscores the physical and software infrastructure on which IT relies.

In the university context, Information Technology is defined as the systematic and strategic application of methods and techniques derived from behavioral and natural sciences aimed at analyzing and improving the higher education process. This is achieved through the use of Information and Communication Technology (ICT) tools to support teaching, enhance the learning experience, strengthen interaction between faculty and students, and improve both academic and administrative performance within the university ([Gökalp, 2010](#)).

2.2 Information Technology Infrastructure

Researchers have expressed differing views regarding the essential components of Information Technology. There is noticeable variation in how these elements are addressed from one study to another. The following section

presents a comparative overview of three studies that have explored this concept, highlighting the extent of agreement or divergence concerning the constituent elements of Information Technology.

Table 1: Components of Information Technology

Source	Hardware Resources	Software Resources	Data Resources	Communication Networks	Human Resources
(Aldjia, 2023)	X	X		X	
(Fatiha, 2021)	X	X	X	X	
(Sahanine, 2017)	X	X	X	X	X
(AlSamawi, 2016)	X	X	X	X	

Source: Prepared by the researcher based on the references listed in the table.

It is evident from the table that there is general agreement among the researchers (Aldjia, 2023), (Fatiha, 2021) and (AlSamawi, 2016) regarding the importance of hardware and software components, as these were consistently included in their studies. The role of data and communication networks in supporting the IT system was also confirmed. However, (Sahanine, 2017) was the only researcher to explicitly include the human element as an integral part of the infrastructure. Based on this framework, the following sections will elaborate on each of these components under the theme "IT Infrastructure," noting that these dimensions will also be adopted in the empirical section of the study.

- **Hardware Resources:** These refer to the tangible, physical components of IT, such as computers, servers, storage units, input, and output devices. Their importance lies in providing the foundational infrastructure needed to operate information systems and perform various technical tasks efficiently (Huimin, 2017).
- **Software Resources:** This refers to a set of commands and instructions written in programming languages, designed to operate hardware and perform specific tasks like processing, storage, and control. Software serves as the intermediary that transforms hardware capabilities into organized and purposeful performance (Huimin, 2017).
- **Data Resources:** These include raw data that is recorded and stored before being processed into useful information for decision-making (Kaakaa, 2020). When such data is organized and compiled into business files, it forms what is known as a database (Ghorishi, 2011).
- **Network Infrastructure:** These are the technological structures that connect various devices to enable data and information exchange either locally or globally. They serve as the communication medium that enables system integration and extends the scope of technical operations (Huimin, 2017).
- **Human Resources:** This includes individuals with the technical and cognitive skills required to plan, implement, operate, and maintain information systems. It comprises system engineers, software developers, business analysts, project managers, and end-users who interact with these systems (Jahangir Karimi, 2001).

2.3 Importance of Information Technology in the University

Information Technology is one of the fundamental pillars that has significantly transformed university performance, particularly in the areas of educational quality, research development, and administrative efficiency.

In education, IT has enhanced teaching methods by integrating computers and interactive learning, providing students with greater opportunities to engage with academic content and understand it deeply. It has also developed students' critical thinking and problem-solving skills through diverse educational software that simulates real-world scenarios. Digital literacy has emerged as an essential skill, comparable in importance to reading and writing, as proficiency in computer usage is now a prerequisite for integration into the digital society and job market. IT has offered varied educational resources like simulations and multimedia, enriching the learning environment and addressing individual differences among students. Furthermore, it has narrowed educational gaps across disciplines and regions, improved both academic and administrative performance through e-learning systems and communication tools, reduced costs associated with traditional methods, and enabled more flexible and efficient education (Gökalp, 2010).

In the realm of scientific research, IT has enabled researchers to quickly access databases, academic journals, and previous studies, improving the quality and pace of scientific output. It has supported academic collaboration via digital platforms and provided advanced tools for analyzing both quantitative and qualitative data, leading to more

accurate and reliable findings. Through electronic publishing, research dissemination has become faster and more widespread, increasing citation opportunities. Additionally, IT has created a comprehensive digital environment, including e-libraries and reference management systems, helping organize and document research effectively. It has also fostered innovation through simulation and design software used across disciplines, accelerating various research phases—from data collection to analysis, evaluation, and publication (Al-Subaian, 2025) .

Administratively, IT has simplified university structures by reducing hierarchical layers, delegating authority, and speeding up decision-making. It has provided effective communication tools such as email and virtual platforms, enabling task performance remotely. IT has automated administrative processes and replaced manual procedures with electronic alternatives, improving operational efficiency and saving time. Consequently, internal information exchange has become faster and more effective, enhancing integration among university units. IT has also enabled universities to adapt quickly to environmental changes and offered advanced tools for planning, organizing, and control, thereby improving the quality of administrative performance. Moreover, it reduced costs associated with physical infrastructure by minimizing the need for paper documents and storage spaces (Youssef, 2019) .

3. Applied Framework of the Study

The University of May 8, 1945–Guelma is among the leading higher education institutions in Algeria, striving to offer a comprehensive educational environment that supports academic training and fosters scientific research. Its structure includes five main campuses equipped with modern pedagogical and technological facilities, covering various academic disciplines and preparing students for effective integration into professional and academic pathways.

Information Technology plays a pivotal role in enhancing performance efficiency within the university, whether by facilitating communication among departments and units or by developing digital platforms that enable students and faculty to interact with educational content and access resources remotely and flexibly. These technologies also contribute to strengthening the network infrastructure and providing advanced digital services that enhance both academic and administrative quality.

3.1 Methodology and Tools

a. Study Population and Sample

The study population consists of the full-time faculty members at the University of May 8, 1945–Guelma, totaling 1,009 permanent professors. Due to the difficulty of covering the entire population, the Krejcie and Morgan formula was used to determine an appropriate sample size. Accordingly, a random sample of 288 permanent faculty members was selected.

b. Research Methodology and Data Collection Tool

Regarding the methodological approach, the descriptive method was adopted due to its suitability for the nature of the study. The main data collection instrument was an electronic questionnaire, which was structured into two main sections: the first section covered the demographic characteristics of the respondents, while the second focused on the theme of Information Technology within the university.

c. Demographic Distribution of the Sample

The demographic profile of the sample indicates a notable degree of diversity and inclusiveness, which enhances the credibility and accuracy of the findings. In terms of gender, the distribution was relatively balanced, with 52.8% male and 47.2% female participants, reducing the likelihood of gender bias. Concerning age, the largest group fell within the 40 to under 50 years range (44.8%), followed by the 30 to under 40 years range (36.1%), indicating a strong presence of active and experienced academics.

With respect to academic rank, the highest proportions were recorded for the ranks of “Senior Lecturer A” (27.8%) and “Full Professor” (26%), reflecting a predominance of highly qualified professionals in the sample. Additionally, professional experience data revealed that the majority of participants had more than 15 years of experience (36.8%), followed by those with 10 to under 15 years of experience (27.4%), underscoring the significant academic weight of the sample.

In terms of institutional affiliation, the Faculty of Economics, Business, and Management Sciences accounted for the highest representation at 40.6%, with varying levels of representation across the remaining faculties. This suggests a rich and diverse academic specialization base.

Overall, the sample's diversity in terms of gender, age, academic rank, professional experience, and institutional affiliation forms a strong foundation for a comprehensive and reliable analysis, allowing for generalizable conclusions about the faculty population at the University of Guelma.

d. Validity and Reliability of the Research Instrument

To ensure the quality of the research tool, face validity was established by presenting the questionnaire to four subject-matter experts. Necessary modifications were made based on their feedback to enhance its precision and relevance to the research topic.

Instrument reliability was assessed using Cronbach's Alpha coefficient. The results showed that all dimensions exceeded the acceptable threshold values, with an overall reliability coefficient of 0.923. This indicates a high level of internal consistency. Consequently, the instrument is considered stable and reliable, and the results derived from it can be confidently used to achieve the study's objectives.

Table 2: Questionnaire Reliability Test

Variable	Dimensions	Number of Items	Reliability Coefficient
Information Technology	Hardware Resources	3	0.89
	Software Resources	5	0.785
	Data Resources	5	0.814
	Communication Networks	4	0.879
	Human Resources	5	0.869
Entire Questionnaire		22	0.923

Source: Prepared by the researcher based on SPSS V.20 outputs.

3.2 Analysis and Interpretation of Results:

This section addresses the analysis of the main dimensions that collectively constitute the components of Information Technology, namely: hardware resources, software-related resources, data-related resources, communication networks, and human resources. These components play a vital role in enhancing and supporting academic and administrative activities within the university.

To analyze the responses, the following five-point Likert scale was employed:

Table 3: Five-Point Likert Scale

Rating Category	1	2	3	4	5
Descriptive Rating	Very Low	Low	Moderate	High	Very High
Mean Score Range	1.00 - 1.80	1.81 - 2.60	2.61 - 3.40	3.41 - 4.20	4.21 - 5.00

Source: (Charfi, 2023).

a. Evaluation of the Hardware Resources Dimension

The table illustrates the perceptions of the study sample regarding the availability of hardware resources in their academic activities, based on the calculated means and standard deviations.

Table 4. Study Sample's Attitudes Toward Physical Resources

No.	Statement	Mean	Std. Deviation	Direction	Rank
1	The technological devices you use in your academic activities are modern.	3.15	0.82	Moderate	1
2	The devices you use in your academic activities have fast processing power.	3.08	0.8	Moderate	2
3	The devices used in your academic activities are capable of handling intensive usage.	3.02	0.84	Moderate	3
Hardware Resources		3.08	0.74	Moderate	/

Source: Prepared by the researcher based on SPSS V.20 outputs.

Based on the table, the statement "The technological devices used in your academic activities are modern" recorded the highest mean score of 3.15 with a standard deviation of 0.82. This indicates that participants' views on the modernity of the devices were generally moderate, suggesting that while the equipment may not be the latest models, they are acceptable in terms of quality.

In second place, the statement "The devices you use in your academic activities have fast processing capabilities" had a mean of 3.08 and a standard deviation of 0.80, which is also considered moderate. This implies that the devices are sufficient in terms of processing speed, although they may not meet the high-speed expectations of some users.

Meanwhile, the statement "The devices used in your academic activities can withstand intensive usage" received a mean score of 3.02 with a standard deviation of 0.84, placing it last among the statements. This reflects a moderate perception of the devices' durability, indicating that they may not be suitable for sustained high-pressure usage over long periods.

Overall, the table shows that the study sample's evaluation of hardware resources in their academic activities was moderate, with an overall mean of 3.08. This suggests that the available equipment is generally functional, though it may have limitations in terms of modernity, speed, and durability.

b. Evaluation of the Software Resources Dimension

The table presents the study sample's perceptions of the software resources available for their academic activities, based on the mean scores and standard deviations.

Table 5: Study Sample's Attitudes Toward Software-Related Resources

No.	Statement	Mean	Std. Deviation	Direction	Rank
4	The available software responds quickly.	3.07	0.86	Moderate	4
5	The software is stable during use.	3.04	0.81	Moderate	5
6	The software ensures the privacy of your personal data.	3.34	0.92	Moderate	3
7	You find the E-learning platform easy to use.	3.55	1.01	High	1
8	The Progres system meets your academic needs.	3.42	0.95	High	2
Software Resources		3.28	0.67	Moderate	/

Source: Prepared by the researcher based on SPSS V.20 outputs.

According to the table, the statement "You find the E-learning platform easy to use" received the highest mean score among the items related to software resources, with a value of 3.55 and a standard deviation of 1.01. This reflects a strong perception among faculty members that the E-learning platform is relatively user-friendly.

In second place was the statement "The Progres system aligns with your academic needs," which scored a mean of 3.42 and a standard deviation of 0.95. This indicates a high level of agreement among the study sample and suggests a relatively positive satisfaction with the system's alignment to their academic requirements.

The statement "The software guarantees the privacy of your personal data" ranked third, with a mean of 3.34 and a standard deviation of 0.92. This implies a general level of trust in the software's ability to ensure privacy, though there may be some reservations regarding full data protection.

In fourth place was the statement "The available software responds quickly," which had a mean score of 3.07 and a standard deviation of 0.86. This suggests that the responsiveness of the software is viewed as moderate, with a few concerns noted regarding response speed.

Finally, the statement "The software is stable during use" ranked last, with a mean score of 3.04 and a standard deviation of 0.81. This indicates that the software used by faculty members is relatively stable, although occasional disruptions or minor issues may still occur.

Overall, the faculty's evaluation of software resources was moderate, with a general mean of 3.28. This suggests that the software and systems used in academic activities reasonably meet their needs, though there are some remarks concerning speed and operational stability.

c. Evaluation of the Data-Related Resources Dimension

The table presents the perceptions of the study sample regarding the availability of data-related resources in their academic activities, based on the calculated means and standard deviations.

Table 6: Study Sample's Attitudes Toward Data-Related Resources

No.	Statement	Mean	Std. Deviation	Direction	Rank
9	The Dspace library databases provide good organization of the university's academic resources.	3.46	0.93	High	1
10	You find the procedures for using the SNDL system clear.	3.27	1.04	Moderate	2
11	The university databases are regularly updated to ensure information accuracy.	3.09	0.84	Moderate	4
12	You find it easy to enter and retrieve data from the available databases.	3.13	0.86	Moderate	3
13	The university databases are protected by advanced security systems.	3.02	0.9	Moderate	5
Data Resources		3.19	0.69	Moderate	/

Source: Prepared by the researcher based on SPSS V.20 outputs.

Based on the table, the statement "The DSpace library databases provide good organization of the university's scientific resources" received the highest mean score among the items, with a value of 3.46 and a standard deviation of 0.93. This indicates that faculty members perceive the DSpace databases as offering well-organized access to the university's scientific resources.

In second place was the statement "The procedures for using the SNDL system are clear," with a mean score of 3.27 and a standard deviation of 1.04. This suggests that the clarity of SNDL procedures is perceived as moderate, implying that some faculty members might face complexities in using the system or may require additional guidance to fully understand the usage processes.

The statement "You find it easy to enter and retrieve data from the available databases" ranked third, with a mean of 3.13 and a standard deviation of 0.86. This indicates a moderate level of ease in using databases for data entry and retrieval, though some users may experience challenges that affect overall usability.

In fourth place was the statement "The university's databases are regularly updated to ensure information accuracy," which recorded a mean score of 3.09 and a standard deviation of 0.84. This also reflects a moderate evaluation, suggesting that while faculty members believe updates occur, there may be reservations about the frequency or consistency of these updates.

Lastly, the statement "The university's databases are protected by advanced security systems" ranked lowest, with a mean of 3.02 and a standard deviation of 0.90. This implies that faculty members feel the databases are reasonably protected, though some doubts may exist regarding the effectiveness of the security systems in place.

Overall, the faculty's evaluation of data-related resources was moderate, with a general mean of 3.19. This reflects a perception that the university's databases and data resources adequately serve their intended purpose, though improvements may be needed in areas such as regular data updates and clearer usage procedures.

d. Evaluation of the Communication Networks Dimension

The table presents the views of the study sample regarding the communication networks available to them in academic activities, based on calculated mean scores and standard deviations.

Table 7: Attitudes of the Study Sample Toward Communication Networks

No.	Statement	Mean	Std. Deviation	Trend	Rank
14	The Internet network available at the university has high bandwidth.	2.4	1.06	Low	2
15	The Internet network provides you with uninterrupted connectivity.	2.4	1.03	Low	2
16	The intranet allows access to all platforms without restrictions.	2.5	1.01	Low	1
17	The university provides regular technical support for networks.	2.38	1	Low	3
Communication Networks		2.42	0.88	Low	/

Source: Prepared by the researcher based on SPSS V.20 outputs.

Based on the table, it is evident that all items within the communication networks dimension received low agreement from the study sample. The item "The internal network allows you to access all platforms without restrictions" ranked first, with a mean score of 2.50 and a standard deviation of 1.01. This indicates that faculty members believe the internal network provides limited access to academic platforms and various resources. This may be attributed to technical barriers or imposed restrictions on certain websites or platforms.

Two items tied for second place: "The internet network available at the university has high bandwidth" and "The internet network provides continuous, uninterrupted connectivity."

Each received a mean score of 2.40, with standard deviations of 1.06 and 1.03, respectively. These scores reflect a low level of agreement, suggesting that faculty members perceive poor internet speed and frequent disruptions in connectivity. These issues negatively affect the effectiveness of internet use in academic activities, indicating significant concerns regarding the stability and quality of the network.

Finally, the item "The university provides regular technical support for networks" ranked last, with a mean of 2.38 and a standard deviation of 1.00, also indicating a low evaluation. This reflects the belief among faculty members that the technical support provided for network issues is neither regular nor sufficient to effectively address technical problems.

Overall, faculty members' evaluation of the communication networks at the university was low, with a general mean score of 2.42. This indicates that they face several challenges in using the university's communication networks,

including weak internet bandwidth, frequent disconnections, restricted access to platforms, and inadequate technical support. Such issues can significantly impact the quality of education and academic interaction.

e. Evaluation of the Human Resources Dimension

The table presents the perceptions of the study sample regarding the human resources dimension, based on calculated mean scores and standard deviations.

Table 8: Attitudes of the Study Sample Toward Human Resources

No.	Statement	Men	Std. Deviation	Trend	Rank
18	Specialists at the university design the software you need to perform your tasks.	2.6	0.99	Low	3
19	Specialists at the university develop software in line with your needs.	2.61	0.94	Moderate	2
20	University specialists offer training courses to ensure optimal use of Progres.	2.34	1.03	Low	5
21	Computing specialists quickly handle malfunctions in the Progres system.	2.79	0.95	Moderate	1
22	Technological equipment is regularly maintained by specialized university teams.	2.51	0.95	Low	4
Human Resources		2.57	0.79	Low	/

Source: Prepared by the researcher based on SPSS V.20 outputs.

Based on the table, the item “IT specialists respond quickly to malfunctions in the Progres system” received the highest mean score among the items, at 2.79 with a standard deviation of 0.95, which is considered a moderate rating. This suggests that the responsiveness of specialists in handling system failures is not fast enough, potentially impacting the academic workflow.

In second place, the item “University specialists develop software that aligns with your needs” recorded a mean of 2.61 and a standard deviation of 0.94, also a moderate rating. This reflects the perception among faculty members that while there is some level of software development, it is insufficient or not fully aligned with the evolving requirements of academic activities.

The item “University specialists design the software you need to perform your tasks” ranked third, with a mean of 2.60 and a standard deviation of 0.99, indicating a low evaluation. This suggests that faculty members believe university specialists do not contribute adequately to designing software tailored to their academic needs, which may hinder the effective use of these tools in academic work.

The fourth-ranked item was “Technological equipment is maintained regularly by specialized university teams”, with a mean of 2.51 and a standard deviation of 0.95, also receiving a low rating. This implies that maintenance is not performed regularly, which could lead to equipment malfunctions or reduced efficiency in various academic tasks.

Finally, the item “University specialists offer training courses to ensure optimal use of the Progres system” ranked last, with a mean of 2.34 and a standard deviation of 1.03, which is a low score. This suggests that faculty members feel there is a lack of adequate training, pointing to a gap in professional development and guidance in using technological tools like the Progres system effectively.

In summary, the table shows that faculty members’ evaluation of the human resources dimension at the university was low, with an overall mean score of 2.57. This indicates a shortfall in technical support, training, and development, both in software design and development, as well as in system maintenance and fault resolution. Such deficiencies may negatively impact academic performance and highlight the need for improvements to ensure more effective use of technological resources.

f. Summary of Hypothesis Testing Results

Based on the previously presented tables, the following summary table highlights the availability and effectiveness of the dimensions of information technology at May 8, 1945 University – Guelma.

Table 9: Attitudes of the Study Sample Toward Information Technology Dimensions

Dimension	Mean	Std. Deviation	Trend	Rank	Hypothesis Decision
Hardware Resources	3.08	0.74	Moderate	3	Accepted
Software-Related Resources	3.28	0.67	Moderate	1	Accepted
Data-Related Resources	3.19	0.69	Moderate	2	Accepted
Communication Networks	2.42	0.88	Low	5	Rejected
Human Resources	2.57	0.79	Low	4	Rejected
Information Technology Axis	2.92	0.58	Moderate	/	Accepted

Source: Prepared by the researcher based on SPSS V.20 outputs.

Based on the table above, the study hypotheses related to the evaluation of information technology dimensions at May 8, 1945 University – Guelma can be discussed as follows:

- **First Hypothesis:** This posits that the participants' evaluation of the level of Hardware resources is moderate. The mean for this dimension was 3.08 with a standard deviation of 0.74, which falls within the moderate range according to the adopted scale. Therefore, the hypothesis is accepted.
- **Second Hypothesis:** This assumes a moderate evaluation of the software-related resources. Results showed a mean of 3.28 with a standard deviation of 0.67, which was the highest mean among the dimensions and also falls within the moderate range. Thus, the hypothesis is accepted.
- **Third Hypothesis:** This refers to a moderate evaluation of the data-related resources. The mean was 3.19 with a standard deviation of 0.69, indicating a moderate availability of these resources. Hence, the hypothesis is accepted.
- **Fourth Hypothesis:** This posits a moderate evaluation of network resources. However, the recorded mean of 2.42 with a standard deviation of 0.88 indicates a low evaluation, which does not meet the required level for acceptance. Therefore, the hypothesis is rejected.
- **Fifth Hypothesis:** This pertains to a moderate evaluation of the human resources dimension, particularly in terms of digital skills and interaction with technology. The mean was 2.57 with a standard deviation of 0.79, indicating a low evaluation as well. Thus, this hypothesis is also rejected.
- **Overall Hypothesis:** This general hypothesis suggests a moderate evaluation of the overall level of information technology. The calculated mean was 2.92 with a standard deviation of 0.58, which falls within the moderate range. Hence, the general hypothesis is accepted.

Based on the above, three out of five sub-hypotheses were accepted, while the two related to "networking" and "human resources" were rejected. This indicates a variation in the availability and effectiveness of IT dimensions at the university.

4. Conclusion

From the above findings, it becomes evident that information technology is no longer merely a set of technical tools and systems, but rather a comprehensive framework of processes and functions that play an essential role in enhancing institutional and research performance in higher education institutions.

From a functional perspective, IT enables efficient data collection and analysis, aligned with evolving work environments. From an infrastructure standpoint, physical technological resources form the essential foundation for system operations. However, the human element remains the cornerstone, as it activates and directs technology to fulfill institutional objectives.

With regard to the applied study conducted at May 8, 1945 University – Guelma, the evaluation results showed that the overall level of IT at the university is moderate, reflecting a noticeable presence of technology. However, the results also reveal disparities in the effectiveness of IT across different evaluation dimensions.

- Software Dimension: Results showed moderate user satisfaction, indicating that existing software generally meets basic needs but lacks the flexibility and advancement required to keep pace with growing academic and research demands.
- Data Resources: These received a relatively positive evaluation, reflecting reasonable ease in accessing and utilizing information. However, this does not imply advanced integration in data management. There remains a need for further development to ensure optimal use of these resources.
- Hardware Resources: The results revealed moderate availability of technical equipment, sufficient to meet minimum requirements. However, the current resources are insufficient to keep pace with rapid technological advancements, which may negatively impact the university's overall performance.
- Human Resources Dimension: This recorded the lowest score among all dimensions. The results indicate a clear lack of specialized competencies in the field of IT, representing a major challenge to developing and effectively utilizing digital systems.
- Networking Infrastructure: The results here were notably negative, with faculty members expressing dissatisfaction with the network's stability and speed. This highlights a critical shortcoming in the university's digital infrastructure and has a direct impact on the effectiveness of academic and administrative operations.

Based on these findings, the study recommends several practical measures to enhance the effectiveness of IT usage at the university:

- Update software to align with the needs of faculty and researchers, aiming for higher performance.
- Improve data management by developing integrated and efficient systems for storing and utilizing information.
- Upgrade technical equipment to match the requirements of digital transformation and keep pace with technological advancements.
- Enhance human resource capabilities through specialized IT training and development programs.
- Strengthen communication networks in terms of speed and reliability to ensure smooth and dependable digital services.
- Strategically integrate technology into university policies to support teaching and research activities effectively.

In conclusion, developing IT at the university requires more than just providing resources. It necessitates integration between the human element and the technical infrastructure, within a clear organizational and strategic framework capable of adapting to changes and achieving institutional excellence.

References

- Aldhmour, F. (2019). Towards Understanding the Relationship between Information and Communication Technology and Competitive Advantage in a developing Economy . *International Review of Business Research Papers*.
- Aldjia, H. (2023). l'usage des technologies de l'information et de la communication: un défi pour les établissements publics de santé en algérie. *Revue El-Tawassol*, 29(1).
- AlSamawi, Y. (2016). choosing Components of information technology infrastructure for business information systems. *International journal of computer and information technology*, 5(6).
- Al-Subaian, A. A. (2025). *The Role of Modern Information Technologies in Enhancing Scientific Research in Saudi Universities: Challenges, Requirements, and Future Opportunities*, *Journal A*, 11(1).
- Charfi, M. (2023). The Impact of Information Technology on Marketing Performance: A Field Study on a Sample of Banks in Constantine Province. *Economic Studies*, 10(1).
- Fahmi Ibrahim, D. N. (2020). *Accounting Information Systems (AIS) in SMEs: Towards an Integrated Framework*, *International Journal of Asian Business and Information Management*, 11(2).
- Fatiha, A. (2021). the role of information technology in improving service quality. *journal of Economic Papers*, 12(2).
- Ghorishi, A. &. (2011). *The Role of Information Technology in Supporting and Activating Customer Relationship Management*. *Journal of Economic and Administrative Research.*, 5(2).

- Gökalp, M. (2010). *A study on the effects of information technologies on university students*, *Procedia Social and Behavioral Sciences*.
- Huimin, M. I. (2017). *Information Technology Components and Their Role in Knowledge Management for Product Design*, *International Journal of Information and Education Technology*, 7(12).
- Jahangir Karimi, T. M. (2001). *Impact of Information Technology Management Practices on Customer Service*, *Journal of Management Information Systems*, 17(4).
- Kaakaa, D. M. (2020). *The Impact of Using Information and Communication Technology on Human Resource Management Functions in the Algerian Enterprise: Case of Chiali Pipes, Sidi Bel Abbes*. *Nour Journal of Economic Studies*, 6(10).
- Sahanine, M. (2017). *The Contribution of Information and Communication Technology in Achieving the Dimensions of Sustainable Development: A Case Study of Algeria*. *Doctoral Dissertation, Business Administration, Department of Economic Sciences, Faculty of Economics, Commercial Sciences and Management Sciences, Djillali Liabes University, Sidi Bel Abbes, Algeria*.
- Youssef, S. F. (2019). *The Role of Virtual Information Technology Systems in the Development of Higher Education Institutions*. *Journal of Arts and Social Sciences*, 11(1).