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## **Advantages of Technological Development and Digitalization in the Preparation of Research and Graduation Theses — An Exploratory Study in Light of the Opinions of Educational Psychology Students at Mohamed Lamine Debaghine University, Sétif 2**

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### **Abstract:**

The preparation of scientific research and the presentation of graduation theses constitute one of the fundamental priorities of academic training in university studies. From the moment students enter higher education, they begin preparing numerous theoretical and applied research projects across most academic disciplines, particularly in the social and human sciences. This process aims to deepen understanding, strengthen acquired knowledge, and consolidate the concepts presented during lectures. It requires a specific methodology that begins with learning how to search for and access scientific sources and references relevant to the research field, and extends to the achievement of scientifically valid results, particularly in field-based research.

There is no doubt that technological development and digitalization have contributed significantly to facilitating the search for scientific material. Students often submit research papers that include extensive lists of books and electronic websites among their references. In practice, their reliance in conducting research has largely shifted toward electronic libraries rather than university libraries and printed books. This transition has been enabled by technological tools that have become accessible to most students, such as mobile phones and computers.

Through this research paper, the discussion addresses the advantages of technological development and digitalization in the preparation of research papers and graduation theses, based on the perspectives of Educational Psychology students at Mohamed Lamine Debaghine University, Sétif 2. The study seeks to answer the following main research question and several subsidiary questions:

- \_ What are the advantages of technological development and digitalization in preparing research papers and graduation theses?
- \_ What are the most important technological tools used in scientific research processes?
- \_ What are the main search engines, libraries, and electronic websites used within your field of specialization?



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- Do you prefer relying on printed libraries or digital resources when preparing your research? Why?

**Keywords:** technological development, digitalization, scientific research, graduation theses, University students.

## 1. Introduction

### Research Problem:

Scientific knowledge is in a continuous state of development. Since the emergence of humankind, human beings have consistently sought to improve their standard of living across various fields, including agriculture, industry, commerce, healthcare, and service sectors, where modern technology has become a fundamental driver of progress. In the contemporary period, livelihoods have become increasingly connected to professions associated with the service sector. With the development of technological tools, particularly computers, the need for digitalization has expanded considerably. This transformation has affected all vital sectors and activities, most notably the field of education.

Educational and academic institutions, including the higher education sector, have witnessed a significant qualitative shift toward digital transformation. In recent years, Algerian universities have sought to digitalize higher education across administrative, relational, and pedagogical dimensions. Furthermore, as a result of the circumstances experienced worldwide, including in Algeria, during the COVID-19 pandemic—marked by lockdowns and the closure of educational institutions—the importance of distance learning became evident and necessary.

Courses and lectures were scheduled and delivered remotely, examinations were also conducted online, and university libraries underwent digitalization. In addition, the supervision of graduation theses was carried out entirely remotely, beginning with topic selection, research plan development, and the electronic distribution of questionnaires, through to data analysis, statistical processing, and the submission of the final work for defense, among other procedures. Accordingly, this research paper examines the advantages of technological development and digitalization in the preparation of research papers and graduation theses, based on the perspectives of a sample of university students.

### 2. Research Objective:

This research aims to identify the advantages of technological development and digitalization in the preparation of scientific research and graduation theses. It also seeks to propose a set of recommendations that may contribute to improving the scientific research process within the context of technological advancement and digital transformation.

### 3. Research Concepts:

#### Technological Development:



According to both Maher Ismail Sabri and Salah El Din Mohammad Tawfiq, technology is not merely science, nor is it simply the application of science or a collection of devices. Rather, it is a broader and more comprehensive concept, as it represents a human activity that integrates both scientific and applied dimensions.

Technology is also defined as: “A human effort and a way of thinking concerned with the use of available information, skills, expertise, and both human and non-human resources within a specific field, and their application in discovering technological means to solve human problems, satisfy needs, and enhance capabilities.” (Nour El-Din Zammam, and Sabah Slimani, 2013, p.165).

Accordingly, technological development includes all available capacities, as well as material and human resources, that may facilitate students’ academic life and support the effective completion of research work.

### **Digitalization:**

Digitalization is generally understood as the process of converting information sources and written documents, in their various forms, from paper-based formats into automated computer-readable formats, according to the specific digital system through which they are presented to readers or researchers who need them. (Ibrir, 2023, p.13).

Faraj Allah (2009) defined digitalization as: “the process through which all documents are converted from paper format into digital format, whereby transactions involving files, images, videos, and encrypted documents become transformed into binary numbers and become usable and receivable through computers.” (Yahiaoui, and Kaibouche, 2024, p.8).

Accordingly, digitalization may be defined as: “the process of converting all scientific resources available in libraries, including primary and secondary sources such as books, journals, university theses, dissertations, and various articles, from paper format into a digital system, and making them accessible to students and researchers through the use of all available technological means.”

### **Scientific Research:**

Scientific research is defined as: “a process of collecting knowledge, facts, data, and information, classifying and analyzing them, and presenting them within a systematic scientific framework that contributes to solving problems and achieving progress and prosperity.” (The Concept of Scientific Research, 2024, n.p.).

In this research, scientific research refers to “all supervised assignments, duties, tasks, scientific activities, field reports, book summaries, and reading cards completed by students and presented during practical sessions in order to reinforce the theoretical knowledge delivered by teachers during lectures. It also includes the various modules prescribed at a specific educational level.”

### **Graduation Theses:**

A graduation thesis is “a scientific research work completed by the student at the end of a university study cycle. It involves selecting a researchable and academically relevant topic



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within a specific specialization and, in most cases, includes both theoretical and practical components. It is submitted as a requirement for obtaining the final university degree at the Bachelor's, Master's, or Doctoral level.”

The objective of preparing a graduation thesis in Educational Psychology is, first, to train students in the fundamentals of methodology and the basic principles of scientific research, beginning with the identification of a problem and the formulation of scientific hypotheses, and extending to the achievement of results and the presentation of recommendations. In addition, it aims to bring students closer to professional practice and society through field training related to the applied component of the graduation thesis.

#### **University Students:**

The university student represents an important stage of life, namely youth. Muhammad Ali Muhammad defined youth as follows: “Youth is essentially a social phenomenon, referring to a stage of life that follows adolescence, during which signs of social, psychological, and biological maturity become clearly evident.” (Muhammad Ali Muhammad, 1985, p.16).

Operationally, the university student in this research refers to: “students of Psychology, Educational Sciences, and Orthophony who are regularly enrolled in the third year, specializing in Educational Psychology, at Mohamed Lamine Debaghine University, Sétif 2, during the academic year 2024/2025.”

#### **4. Previous Studies:**

The study conducted by Suleiman Hussein Al-Muzayen (2016), entitled “Identifying the Most Important Obstacles to the Implementation of E-Learning in Palestinian Universities from the Students’ Perspective and Ways to Reduce Them in Light of Certain Variables,” was carried out on a sample of 381 students from humanities and applied faculties. The study concluded that several obstacles hindered the implementation of e-learning, including students’ engagement with websites unrelated to e-learning, the limited number of available devices compared with the number of students, and the lack of cooperation among universities in exchanging expertise to develop e-learning. (Asmaa Ahmed Ezzat Othman, 2023, p.7).

The study by Sahar Abdel-Majid Muhammad Ali (2021), entitled “A Future Vision for Advancing Educational Institutions in Light of the Requirements of Digital Education,” aimed to identify ways of developing and improving educational institutions by determining the requirements of digital education, strengthening infrastructure, and preparing an advanced society in scientific and cultural fields in order to keep pace with various global developments. The sample used in this study consisted of faculty members, specialists, and students.

The questionnaire was used as a tool for the practical and field study through a comparison between digital education in public, experimental, and private institutions, based on the descriptive experimental method. One of the most prominent findings of this study was that



performance speed, ease of understanding and comprehension, time management, and attendance rates were higher in experimental schools than in public and private schools. Therefore, the requirements of digital education must be provided in order to develop the educational process and encourage university students to direct their graduation projects toward the topic of digital education. (Yahiaoui, and Kaibouche, 2024, p.8).

The study by Hanan Yahiaoui and Omar Kaibouche (2024), entitled “Requirements of Digitalization in Algerian Universities from the Perspective of the Actors of the Educational Process,” mainly aimed to:

- \_ Identify the reality of implementing digitalization in the higher education sector.
- \_ Determine the most prominent challenges facing this process.
- \_ Examine the most important requirements of digitalization in Algerian universities.

The study was applied to a sample consisting of 45 teachers and 60 students, who were randomly selected from three national universities: Tيارت, Djelfa, and Algiers. Electronic questionnaires were used to collect data, and the descriptive analytical method was adopted. The results were analyzed using SPSS 26.

The most important findings of the study were as follows:

- \_ Universities do not possess an organized and effective strategic plan for digital transformation.
- \_ High-speed internet connectivity is not available in the three universities.
- \_ University infrastructure and technical facilities lack sufficient devices, computers, and related technological equipment.

The most prominent requirements identified by the study, from the perspective of teachers and students, were as follows:

- \_ The necessity of using digital technologies in the educational process.
- \_ Increasing internet speed in order to avoid problems during digital interaction.
- \_ Adopting the Information and Communication Technology module as a compulsory course taught across all specializations and academic levels. (Yahiaoui and Kaibouche, 2024).

## **5. Field Procedures:**

### **1) Research Method:**

The descriptive method was adopted in this research, using a qualitative research approach, as it is the most appropriate approach for explaining, interpreting, and analyzing scientific phenomena. Through this approach, the study sought to identify the advantages of technological development and digitalization in preparing research papers and graduation theses from the perspective of university students.

### **2) Research Tool:**

For the purpose of data collection, a questionnaire was designed consisting of ten (10) questions, most of which were open-ended. These questions addressed the advantages of



technological development and digitalization in preparing research papers and graduation theses. The formulation of the questions was based on an exploratory survey of students' opinions, as well as on several theoretical readings related to the present topic. The questionnaire questions are presented below:

**Table No. (1) shows the content of the research tool.**

Number	Question Text
1	Mention the most important advantages/positive aspects of digitalization in preparing research papers and graduation theses.
2	What are the most important technological media you rely on in preparing your research?
3	Mention the most important search engines used in your field of specialization.
4	In preparing your research, do you prefer relying on paper-based libraries or digital resources? Why?
5	In your opinion, has digitalization improved the supervision process of graduation theses? / Your relationship with the supervisor.
6	Has digitalization improved collaborative work between you and your colleagues in preparing research papers and graduation theses?
7	What is the percentage of your reliance on the Internet in preparing your research? Can you completely dispense with paper-based libraries?
8	What obstacles prevent you from relying on modern technology in preparing research papers and graduation theses?
9	Does the university provide you with dedicated digital spaces for preparing your research?
10	You may add anything you consider relevant to this topic.

### 3) Psychometric Properties:

The research relied on open-ended questions; therefore, the statistical reliability and validity coefficients typically associated with closed-ended scales were not calculated. Instead, emphasis was placed on the linguistic accuracy of the questionnaire items and their relevance to the objectives of the research.

### 4) Research Sample:

The research sample consisted of third-year Educational Psychology students, selected purposively from among students enrolled in the Department of Psychology, Educational Sciences, and Orthophony at Mohamed Lamine Debaghine University, Sétif 2, during the academic year 2024/2025. The sample of the present research included 56 female students.

### 5) Research Boundaries:



- **Temporal boundaries:** The exploratory study was conducted on November 20 and 21, 2024, during which the questionnaires were distributed to all third-year Educational Psychology students.
- **Spatial boundaries:** The exploratory study was conducted at the Faculty of Humanities and Social Sciences, Department of Psychology, Educational Sciences, and Orthophony, Mohamed Lamine Debaghine University, Sétif 2.

## 6) Presentation and Analysis of the Research Results:

The results are presented qualitatively, in accordance with the nature of each question. The following section presents the students' responses to the questionnaire questions:

### **Question One: Mention the most important advantages/positive aspects of digitalization in preparing research papers and graduation theses.**

The students identified numerous advantages of digitalization in preparing research papers and graduation theses. The most important of these are as follows:

- Providing a large number of books and theses in PDF format.
- Facilitating the scientific research process and enabling rapid access to information.
- Saving time, effort, and the burden of traveling to universities and libraries to obtain references.
- Facilitating communication with research and thesis colleagues, as well as with the supervising professor.
- Obtaining references and previous studies easily.
- Learning research methodology and methods for preparing theses through YouTube lessons.
- Providing the possibility of conducting research at any time and from any place, especially for working students and heads of families.
- Reducing financial costs compared with purchasing books or photocopying scientific references.
- Ensuring the availability of references and studies from all over the world and in various languages.
- Enhancing accuracy in data analysis through the Statistical Package for the Social Sciences, SPSS.

### **Question Two: What are the most important technological media you rely on in preparing your research?**

All members of the sample reported using mobile phones in preparing research, at a rate of 100%. Some students also indicated reliance on computers, while a very small number of sample members stated that they depend on Internet cafés for preparing research.

### **Question Three: Mention the most important search engines used in your field of specialization.**

The students' responses focused on the following search engines and platforms:



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Al-Noor Library, Google search engine, Google ASJP, Google Scholar, Shamaa Library, Wikipedia, Mawdoo3 website, Archive Library, ChatGPT, PsycINFO, Google Books, the website of Mohamed Lamine Debaghine University, Sétif 2, and PDF lectures.

**Question Four: Do you prefer relying on paper-based libraries or digital resources in preparing your research, and why?**

Students prefer digital resources and rely on them by 90% in preparing their projects and research papers, for several reasons, the most important of which are:

- \_ Digital resources are available at all times.
- \_ They allow easy and rapid searching and access to information.
- \_ They save effort and time, without the burden of traveling to libraries.

Some students, however, confirmed that they rely on both electronic and paper-based resources. They stated that they use university libraries when information is not available online, as well as for searching specialization-related sources in order to verify the accuracy of information.

**Question Five: In your opinion, has digitalization improved the supervision process of graduation theses / your relationship with the supervising professor?**

Most students emphasized the importance of digitalization in improving the supervision process through the following points:

- \_ Facilitating communication with the supervising professor and scheduling supervision sessions through Facebook or email.
- \_ Sending work or inquiries via email or Messenger.
- \_ Benefiting from certain references and studies sent by the supervising professor via email.

Some students also indicated that they prefer direct supervision and face-to-face meetings with the professor in order to better understand and discuss the topic, especially since they are at the Bachelor's level and require direct contact with the professor to understand issues related to methodology and research procedures.

**Question Six: Has digitalization improved collaborative work between you and your colleagues in preparing research papers and graduation theses?**

All members of the research sample answered "yes." Digitalization has improved collaborative work among student colleagues in preparing research papers and graduation theses through:

- \_ Relying on social media platforms to communicate, discuss the work plan, and prepare projects.
- \_ Facilitating time management and remote work.
- \_ Enabling the easy and rapid exchange of information and images related to research through Messenger and email.

The students also indicated that they resort to face-to-face meetings to prepare assignments and projects only in limited cases, depending on the requirements of the research.



**Question Seven: What is the percentage of your reliance on the Internet in preparing your research? And can you completely dispense with paper-based libraries?**

The majority of students explained that they rely on the Internet in preparing their research by 80%, while others confirmed that they combine both digital and paper-based references when preparing their research.

The students indicated that they cannot completely dispense with paper-based libraries and that they use them in certain cases, such as weak Internet connectivity, or out of a desire to expand their search for references and sources of information.

**Question Eight: What obstacles prevent you from relying on modern technology in preparing research papers and graduation theses?**

The students agreed in their responses on a set of obstacles that prevent them from relying on modern technology in preparing their research. The most important obstacles are as follows:

- The lack of material resources and tools, such as computers and mobile phones.
- Weak or sometimes unavailable Internet connectivity, especially in remote areas.
- The family's limited financial capacity and inability to afford Internet costs.
- Limited or absent knowledge of digital sources and references within the field of specialization.

**Question Nine: Does the university provide you with dedicated digital spaces for preparing your research?**

The students confirmed that the university does not provide digital spaces or Internet rooms for students to study and prepare research. The services provided in this area are limited to cataloguing services, which allow students to search for the numbers and titles of paper-based books available at the faculty library and the library of the Department of Psychology.

The students also referred to weak Internet connectivity across the university as a whole, while resident female students confirmed that university residences provide Internet rooms from which students can benefit.

**Question Ten: You may add anything you consider relevant to this topic.**

The students' responses to this question consisted of a set of suggestions that may be considered as needs. These suggestions could contribute to improving the scientific research process and the preparation of graduation theses through the adoption of modern technology and digitalization. The most important of these will be presented in the recommendations section at the end of this research.

**7) Discussion of the Results:**

The results obtained from the students' responses to all questionnaire questions clearly demonstrate the importance of digitalization in preparing research papers and graduation theses. Regarding the first question, the students identified numerous advantages of digitalization and technology in preparing their research, the most important of which include



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the availability of abundant references, search speed, reduced financial cost, and accuracy in data analysis.

This result is consistent with the study conducted by Sahar Abdel-Majid Muhammad Ali (2021), which aimed to identify ways of developing and improving educational institutions by determining the requirements of digital education and strengthening infrastructure. Among its findings were that performance speed, ease of understanding and comprehension, time management, and attendance rates were higher in experimental schools that applied digitalization in the educational process. Therefore, the requirements of digital education must be provided.

As for the second question, which concerns the technological media used in research, all students confirmed their reliance on mobile phones by 99% in preparing research, while computers are used only in very limited cases. Through their responses to the third question, the students referred to the most important search engines and platforms used in completing their research, most notably Al-Noor Library and Google Scholar, in addition to the website of Mohamed Lamine Debaghine University, Sétif 2, for obtaining lectures.

Regarding the fourth question, the students confirmed that they rely more on digital resources than on printed books, due to the ease of digital searching and the avoidance of travel to universities and external libraries.

With respect to the students' responses to the fifth and sixth questions, which concern the nature of the relationship with the supervising professor and with research or thesis colleagues, the students confirmed that digitalization has significantly improved the research preparation process through the ease and speed of communication via email and social networking sites, including the exchange of files, images, and all materials related to the research. In their responses to the seventh question, the students also indicated that they rely on the Internet in research by 80%, and that they cannot completely dispense with paper-based libraries at the present time, especially in light of weak Internet connectivity.

As for the eighth question, the students referred to a set of obstacles that prevent them from relying on modern technology in preparing research papers and graduation theses. The most important of these include the lack of material resources, such as computers, weak or unavailable Internet connectivity, especially in remote areas, and insufficient knowledge of how to use technology and digital sources within the field of specialization. This result partially agrees with the study conducted by Suleiman Hussein Al-Muzayen (2016), entitled "Identifying the Most Important Obstacles to the Implementation of E-Learning in Palestinian Universities from the Students' Perspective and Ways to Reduce Them in Light of Certain Variables." The study concluded that several obstacles hindered e-learning, including the limited number of devices compared with the number of students.

Regarding the ninth question, the students unanimously agreed that the university does not provide digital spaces or Internet rooms for students, in addition to weak Internet connectivity across the university as a whole.



This result is consistent with the study by Yahiaoui and Kaibouche (2024), which aimed to identify the requirements of digitalization in Algerian universities. Among its most important findings were the absence of high-speed Internet connectivity and the lack of infrastructure and technical facilities, including devices and computers.

### **Conclusion:**

Based on the foregoing, the importance of technological development and digitalization in preparing research papers and graduation theses becomes evident. The students confirmed the advantages of digitalization in conducting university research, despite the obstacles they mentioned, which hinder the effective use of technological development in the field of research.

These obstacles are mainly related to weak Internet connectivity and the lack of material resources and technical infrastructure at Mohamed Lamine Debaghine University, Sétif 2, as is the case in many national universities, within the limits of the researcher's knowledge. Studies in this field remain limited or are still in their early stages. The present research may therefore be considered a starting point for conducting broader and more in-depth studies.

At the conclusion of this research, a set of suggestions was identified, mainly based on the students' responses to the tenth question. These suggestions may contribute to improving digitalization and promoting interest in technological development within Algerian universities, given its importance in advancing scientific research. The most important of these suggestions are presented below:

- \_ Providing special offers for students and imposing discounts on technological tools so that all students can acquire them and keep pace with technological development.
- \_ Increasing Internet connectivity in places where students are present, such as universities and university residences.
- \_ Launching electronic platforms and dedicated websites for the supervision of graduation theses, enabling students to communicate with supervisors and work remotely.
- \_ Developing special programs for translating foreign sources and making them accessible to students.
- \_ Providing students with more training in the field of modern technology and digitalization so that everyone can study and prepare research remotely.
- \_ Allowing both the student and the supervising professor the freedom to choose the method of defending the graduation thesis, whether in person or virtually, taking into account the circumstances of the student and the examining professors.



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