

Mechanisms for Activating Scientific Research Ethics in the Context of the Digitization of Higher Education Services in Algeria (An Analytical Study of Relevant Legislative and Regulatory Texts)

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Received
29/04/2025

Accepted
08/08/2025

Published
31/10/2025

Abstract:

The digital transformation in the field of scientific research has resulted in a violation of the ethical rules of scientific honesty and infringement of intellectual property rights. The Algerian University has kept pace with this transformation by using appropriate mechanisms to confront the ethical, legislative and technical challenges in the field, It aims to uncover the following problem:

In light of the digital transformation, how can the integrity of scientific research be guaranteed, according to the legal texts regulating scientific research activities in Algeria?.

key words:

Digital ethics - Scientific research ethics - Algerian University - Scientific honesty - intellectual property -

introduction:

Digitization is an issue that arises in the context of Algerian higher education institutions, which is uncovering various challenges such as ethical challenges, organizational challenges, and technical challenges. One of the most visible challenges is the ethical issues

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concerning the integrity of scientific research, privacy rights of people, and ownership of intellectual property.

This situation requires for the establishment of strong mechanisms and extensive legal frameworks for governing such changes while maintaining scientific integrity and transparency. The intersection of legislative, ethical, and technical domains poses a challenge with several faces, demanding policy clarity and compliance with national and international legislations. Herein lies the importance of this study, which analyzes the legislative and regulatory provisions and rules governing scientific research activities in Algeria in light of the implementation of the digitization program in the field of higher education and scientific research. in an attempt to answer the following problem.

- Problem of the study:

What are the mechanisms used to ensure integrity in facilitating digital transformation within the field of higher education services in Algeria, and how is the quality of scientific research and the regulation of research activities ensured in light of the legal and regulatory texts adopted by Algerian universities?

In light of the digital transformation in higher education services management in Algeria, **what mechanisms are used to ensure the integrity and quality of scientific research and rationalize the management of scientific research activities, according to the legislative and regulatory texts adopted to achieve this goal at Algerian universities ?.**

- Methodology used:

To address the issues raised, we adopted the content analysis method, which is one of the analytical sub-methodologies. Based on the study's methodology and the tools applied, this is considered a qualitative analytical study conducted at two levels:

A formal level related to the regulatory texts organizing the mechanisms of digital transformation and the use of artificial intelligence technologies.

A substantive level focusing on the content of these texts as applied at Algerian universities.

- General Division of the study:

This study was carried out as an analytical approach to legal texts in accordance with the rules and techniques of "methodological legal text analysis." The study takes the form of an article and is structured around the following three main components:

Introduction to the Analysis: This section presents a formal overview of the analysis, ending with the phrasing and thematic identification of the legal texts that are the subject of analysis. It also proposes a suitable plan for presentation and discussion of the underlying legal issues.

Presentation: This section includes the discussion of the content of the legal texts, following the proposed plan that was laid out earlier.

Conclusion: This section presents the results of the analysis, including answers to the legal issues raised. It also provides proposals and recommendations based on the findings derived from the texts.

Typical content analysis of the texts under study

Introduction to the analysis:

First - Formal Analysis of the Texts: According to their nature and Source, the texts being analyzed are two series issued by some authorities: First Batch of Legal Documents Pending Review: This set includes the following two legal documents:

1- Nature of the Texts: Legislative texts.

2- Source of the Texts: Competent legislative authority.

3- Location of the Texts:

3-1 – Law N^o: 18-07, of June 10, 2018, relating to the protection of persons as far as the processing of personal data, is concerned

Published in Official Journal No: 34, of June 10, 2018 ¹.

3-2 – Order N°: 03-05, of July 19, 2003 relating to copyright and related rights, is concerned Published in Official Journal N°: 44, du 23 juillet 2003, Ratified by Law N°: 03-17, of November 4, 2023 Published in Official Journal N°: 67, of November 5, 2003 ².

4- Structure of the Texts:

4-1 – The Physical Structure of the Legal Texts: The initial text, which finds expression in Law No. 18-07, is composed of 76 articles compiled in 13 pages. It contains seven sections, the titles of which are respectively and sequentially as follows: General Provisions, Basic Principles for the Safeguarding of Personal Data National Authority for the Protection of Personal Data Rights of the Subject Individual, Duties of the Data Controller Administrative and Penal Provisions, and Final and Transitional Provisions.

The second document, represented symbolically by Ordinance N°: 03-05, is comprised of 164 articles compiled in 19 pages. It is also divided into seven sections, titled in order as follows: Plagiarism Copying Protection of Neighboring Rights Protection of Copyright and Related Rights Protection of Categories and Authors' Rights Collective Management of Rights and Special Categories Protection Procedures and Penalties, Traditional Cultural Expressions and Public Domain Works, and Final and Transitional Provisions .

4-2 The Linguistic Structure of the: The documents are marked by legal terminology that is exact, with precision of meaning, particularly in definitions. The definitions are clearly stated and the organization exhibits rules of coherence and clarity. The two documents employ direct and explicit language that expresses the

¹ - Law N°: 18-07, of June 10, 2018, relating to the protection of persons as far as the processing of personal data, is concerned Published in Official Journal N°: 34, of June 10, 2018.

² - Order N°: 03-05, of July 19, 2003 relating to copyright and related rights, is concerned Published in Official Journal N°: 44, du 23 juillet 2003, Ratified by Law N°: 03-17, of November 4, 2023 Published in Official Journal N°: 67, of November 5, 2003.

force of legal authority These contain uniform legislative. Legislative terminology is rigorously regulated, and the duplication of some legal norms highlights the importance of regulatory regulations covering the processing of personal data, protection and administration of authors' and neighboring rights.

The Second Set of Documents: These include three legal documents as follows:

1 – Location of the Texts :

1-1 – Decree of the Minister No: 1082, on 27 December 2020, regarding rules to avoid plagiarism and combat it, especially with the aim of official publication in higher education and scientific research¹.

1-2 University Charter of Ethics and Conduct: issued by the Council of Ethics, on academic and professional ethics in higher education and scientific research, and published on the official website².

1-3 Ministerial Memorandum on Digital Ethics: issued by the Council of Ethics, dealing With digital ethics in professional and academic practice at higher education and scientific research ³.

2 – Nature of the Text: They are regulatory documents.

3 – Source of the Text: The issuing authority is the executive authority, represented by the Ministry of Higher Education and Scientific Research.

4 – Structure of the Texts:

4-1 –Printed Copy of the Texts:

¹ - Ministerial resolution N°: 1082 of december 27_2020, siting the rules for the prevention and fight against plagiarism, Official Bulletin of Higher Education and Scientific Research, Fourth Quarter 2020.

² - The University Code of Ethics and Conduct, issued by the University Ethics and Conduct Council, the official website of the Ministry of Higher Education and Scientific Research, visited on 07/14/2024, at the following link:

<https://www.mesrs.dz/>

³ - Memorandum on Digital Ethics, issued by the Council of University Ethics and Professional Conduct, official website of the Ministry of Higher Education and Scientific Research, visited on 07/14/2024, at the following link:

https://services.mesrs.dz/cned/download/Note_sur_ethique_num%C3%A9rique_2_Aout_2023_ar.pdf

- **First Document:** The primary document, as embodied in Decree No: 1082, is the main legal foundation of this research. It is a regulatory document dealing with the regulation of norms and procedures on the prevention and fight against academic plagiarism. It has five chapters, divided into sections, and a total of 33 articles in 9 medium-sized pages. The chapters are as follows: Preliminary Provisions Definition of Plagiarism Preventive Measures for Academic Plagiarism Procedure for Handling Instances of Academic Plagiarism and Sanctions

Final Provisions The last page (page 10) contains a template for researcher declaration of commitment to academic integrity and a thesis submission authorization statement, actually indicating the researcher's personal responsibility and compliance with academic requirements.

- **The Second Document, as embedded in the University Charter of Ethics and Conduct:** begins with a preamble, followed by five sections with clear and unmistakable titles, viz.: Ethical Principles and Commitments, Mistakes and Sanctions, Signatures, Codes of Conduct, General Rules of Behavior.

- **The Third Document, as the Digital Ethics Charter,** is concise, consisting of just five pages. It starts with a concise preamble, and its contents are presented as unnumbered items in list form, with the following titles and themes: What needs to be addressed: Privacy respect, Data accuracy, Data security, Ownership of information resources, Protection of personal data, Intellectual property rights, Ethical design and artificial intelligence, Digital signature.

4-2 – Linguistic Structure: Relative to Decree N^o: 1082, the language structure is uncomplicated and direct, using straightforward and concise terminology. The terminology is thematic and echoes the prescriptive and regulatory character of the provisions on the fight against academic plagiarism, particularly with its focus on formal articulations of norms and sanctions. In terms of style and language, the University Charter of Ethics and Conduct and the Digital Ethics

Memorandum are both marked by plain and straightforward language, in contrast to the legal, technical, and rather obscure words and phrases used in the first document. These two charters refrain from excessive use of complicated legal terminology, and instead use a plain, aggressive style suitable to their normative content.

The norms they codify are expressed in an authoritative manner demanding implementation and stressing enforcement and obedience.

The normative character of such texts demands a prescriptive and imperative style of language, which they generally adhere to, although some of the rules still need more specific phrasing or firmer formulation to obtain greater compliance and comprehension.

Thematic analysis of text content:

- **General idea:** By examining the content of the aforementioned texts under analysis, it becomes evident that their essence can be summarized in a general idea, namely that:

“The ethical considerations of scientific research in Algeria in light of the implementation of the digitization program in the field of higher education”.

- Main Ideas:

The following are the most significant underlying concepts concerning the overall concept derived from the subject of the texts that were previously analysed :

✓ Activating research ethics by using legal tools that are precautionary and deterrent in nature to guarantee the legal safeguarding of academic integrity within the framework of the digital revolution of Algerian universities.

✓ Maintaining the integrity of scientific research by keeping essential components in the Algerian higher education system during the era of digital transformation

Problematic: What are the legal steps to maintain academic integrity and Activating research ethics amidst ethical dilemmas brought about by digital transformation in providing higher education services in Algeria, in line with what this transformation requires both technically and legally?

Proposed plan for analysis: The following plan was put in place to address the issue identified:

Section I: Means of protecting academic integrity to ensure the integrity of scientific research in the context of digital transformation.

A) subtitle: Preventive means.

B) subtitle: Deterrent means.

Section II: Protected Elements to ensure the integrity of scientific research in the context of digital transformation.

A) subtitle: Intellectual Property Protection in the context of digital transformation.

B) subtitle Personal Information and Data Protection in the context of digital transformation.

Analytical Chapter:

Section I:

Means of protecting academic integrity to ensure the integrity of scientific research in the context of digital transformation.

From various texts (above illustrations), it was revealed that the Algerian Ministry of Higher Education and Scientific Research has taken steps towards resolving the issue of scholarly plagiarism and its impact on scientific research, particularly in light of the emerging trend and different forms of scholarly thievery facilitated by online platforms. These actions include releasing strict legal provisions and awareness campaigns to put into perspective the gravity of the issue and the call for responsibility.

At the same time, efforts have been directed to establish preventive measures, such as preauthorization processes, to ensure the ethical conduct of scientific research within virtual surroundings. These procedures also include the prescription of types of misconduct, providing clear mechanisms of how to avoid academic piracy, and the

Clear sanctions for proven cases. To them belong the preventive regulatory institutions formulated by the legal tools guaranteeing protection for intellectual property and copyright - specifically as placed in the above texts quoted in this analysis (Order N^o: 03-05) and at the Algerian university level.

A) subtitle: Preventive means: the Preventive strategies used according to the texts under analysis are:

1- Ethical Awareness: Focus on Providing Good Study Habits Most universities have shifted towards fostering good pedagogic practice transmission and ethical awareness. The regulating body over the Algerian higher education sector adopted this direction by issuing a “Charter of Ethics and Conduct” for universities, as outlined above in the analysis. This charter was updated at the request of the Minister of Higher Education and Scientific Research and published in 2023. As put forth in the aforementioned ministerial memo, this emphasizes the requirement for the evolution of the charter to include digital ethics. This is especially relevant due to the new ethical challenges posed by digitization.

The Algerian university is also required to establish the Guidelines for ethical use of internal digital media resources according to the charter. These should be followed by all users in a binding manner.

2- the application of digital technology: Because of the inadequacy of the traditional mechanisms for dealing with academic piracy, the need was made to use technological mechanisms to achieve this, which is known as the principle of equalizing confrontation mechanisms whereby the confrontation mechanisms are proportionate with the methods used in committing it. That is what the Algerian university has achieved by obliging higher education institutions and research institutions to apply the following control measures:

- **Through the utilization of detection software for Academic piracy:** in Arabic, foreign languages, by obtaining rights to use such software or by utilizing freely downloadable software from the

internet, as well as other existing software, or by developing an Algerian detection software program for academic piracy. Among the attempted technical measures by Algerian universities to find out academic piracy, we also come across. Internet Monitoring Tools for Academic Theft (SNDL). This is a project aimed at using advanced technology to monitor and identify potential academic theft.

It helps by providing tools for monitoring online plagiarism in various languages and research fields, through software that can detect and report instances of academic dishonesty for "CCDZ," the advancement of the "PNST" system has led to the creation of specialized online tools for monitoring and detecting academic theft, especially through online academic journals like "ASJP". These tools help ensure the integrity of research by cross-referencing and reporting potential plagiarism, which enhances the originality of scholarly publication.

- **The scholarly research digitization:** the system involves the establishment of a robust research framework designed to monitor and prevent scholarly plagiarism. This is achieved through the utilization of sophisticated software tools, including the Dspace system, that facilitate the protection of scholarly integrity and verification of scholarly papers.

- **Construction and establishment of the information and communication technologies infrastructure:** The application of digital technologies in the area of scientific research requires the presence of an appropriate infrastructure to allow for this use. It is that the national authorities are giving precedence, especially under the national support framework. The President of the Republic highlighted the need for this area in many areas, especially those of higher education and scientific research. Algeria has this discipline through the following institutions:

✓ Development of an infrastructure based on terrestrial, submarine, and satellite fiber-optic links, high-speed and ultra-fast, to provide the necessary capabilities for information exchange

with quality service, as per international standards and at a safe level of compatibility.

✓ Progressive deployment since 2014 of third-generation mobile telephony technology across the national territory and upgrading in 2016 to fourth-generation technology; and planned work to introduce fifth-generation technology and the Internet of Things.

✓ The Algerian satellite 'AlComSat-1' that was launched in the year 2017 With a view to ensuring regulation of the market in postal and electronic communications under the auspices of the Authority for the Regulation of Electronic Communications and Postal Services.

3- Shaping the legislative framework: It refers to the policy of digitization, primarily looking at the linked development in all areas. This involves a comprehensive legislative environment in Algeria, mainly higher education, and coincidentally based on the development in the technological aspect. It includes placing into order the use of digital technology as well as developing relevant legal regulations and obligations.

This was achieved by the authorized body by issuing the current version of the University Charter of Ethics and Deontology in 2023 that includes some legal provisions regarding digital ethics. One of them is cited under the subtitle “Principles of Ethics,” more specifically in Article 7 of the first axis of the Charter.

B) subtitle: Deterrent Means: according to the texts under analysis, These means consisted of:

1- Disciplinary System: The disciplinary procedures for handling and punishing Academic theft are set out under Chapter Four of Decision No: 1082, the subject matter of discussion. The decision has provisions that distinguish between the disciplinary procedures for students and professors, respectively, as follows:

- Disciplinary Actions against the Student: Such actions are set forth by Articles 8 through 17 of the aforementioned chapter and are briefly as follows: notification of scholarly plagiarism, as it is detailed in Article 3 of this decision, which involves a formal written report made to the Head of the Education and Research Unit. The

aforementioned report is then forwarded by the latter to the institution's Ethics and Conduct Committee to complete the necessary investigation and inquiry procedures. The aforementioned committee is required to submit its report to the Head of the Research Unit within thirty days from the date of receipt of notice of occurrence of the event.

When the committee report confirms academic plagiarism, the case is sent to the Unit's Disciplinary Council by the Head of the Education and Research Unit. Notification in writing by the confirmed facts attributed to the suspect student is made by that student, accompanied by the referral decision to the Disciplinary Council, as well as the meeting date and location, within the time limit specified by the corresponding regulations. The disciplinary board of the teaching or research unit convenes within the timeframes prescribed in the applicable regulations. The disciplinary hearing is conducted in accordance with rules of disciplinary procedure, such as such safeguards as personal attendance unless legally justifiable, right to be heard, right of defense, right of representation, and others.

These guarantees are further reaffirmed under Articles 13 to 15, which allow the disciplinary council to adjudicate on the case against the accused student within the period specified under the pertinent rules. The student has the right to appeal the verdict against him to the disciplinary council according to the provisions of Decision No. 371, dated June 11, 2014, which stipulates the disciplinary councils in higher education institutions, their formation, and their operation.

Penalties imposed on the student : Article 27 of the same decision stipulates this as follows: “Without prejudice to the penalties stipulated in the applicable legislation and regulations, particularly those specified in Decision N^o: 371 of June 11, 2014, which states: “Any action that constitutes plagiarism within the meaning of Article 3 of this decision and is related to the scientific and pedagogical work required of the student in the graduation theses for the bachelor's, master's, master's, or doctoral degrees, before or after their

discussion, exposes its author to the invalidation of the discussion and the withdrawal of the title he holds” .

- **Disciplinary Actions against the professors:** It does not differ much from the disciplinary procedures for the student, except in accordance with the status of the teacher as a public employee subject to the provisions of Order N^o: 06-03, which includes the basic law for the public service, so that actions are set forth by Articles 18 through 26 of the aforementioned chapter and are briefly as follows: notification of scientific plagiarism as it is articulated in Article 3 of this decision, which involves a formal written report made to the Head of the Education and Research Unit. The aforementioned report is then forwarded by the latter to the institution's Ethics and Conduct Committee to complete the necessary investigation and inquiry procedures. The aforementioned committee is required to submit its report to the Head of the Research Unit within (45) days from date of receipt of notice of occurrence of the event.

When the committee report confirms the scientific plagiarism The head of the Education and Research Unit refers the file to the unit's disciplinary board. The board then notifies the professor accused of plagiarism in writing of the proven facts attributed to him, along with the referral decision to the disciplinary board and the date and place of the meeting within the deadlines stipulated in the applicable regulations. The Administrative Committee, in its capacity as a disciplinary board, shall meet and deliberate in accordance with the terms and conditions specified in Order N^o: 06-03. This committee shall record in the minutes of the meeting the facts attributed to the accused, as stated in the report of the institution's Ethics and Morals Council, in addition to the observations and arguments of the accused professor or his defense.

The party concerned shall be notified of the decision containing the disciplinary penalty within a period not exceeding eight (8) days from the date of the decision being taken, and it shall be kept in his administrative file. The teacher may submit an appeal to the competent appeals committee against the disciplinary decision taken

by the administrative committee meeting as a disciplinary council before it, in accordance with the conditions and deadlines stipulated in the legislation in force.

Penalties imposed on the teachers: Article 28 of the same decision stipulates this as follows: “Without prejudice to the penalties stipulated in the Order N^o: 06-03, dated June 15, 2006, containing the general basic law of the civil service, states that any act that constitutes plagiarism within the meaning of Article 3 of this decision and is related to the scientific and pedagogical work required of a professor-researcher, a university hospital professor-researcher, or a permanent researcher in pedagogical and scientific activities, in master's theses, doctoral dissertations, other research projects, university qualification work, or any other scientific or pedagogical publications that are legally proven, during or after their discussion, publication, or presentation for evaluation, exposes its owner to the annulment of the discussion, the withdrawal of the title he holds, the suspension of the publication of those works, or their withdrawal from publication.

2- The criminalization and punishment system: According to decision N^o: 1082, the act of theft is a crime and is punishable not only disciplinary, but also criminally. This is what Article 30 of the decision stipulates as follows: “Any party harmed by a proven act of plagiarism may sue its perpetrators in accordance to the Order N^o: 03-05 dated July 19, 2003. Where we find it criminalizes plagiarism of works within the meaning of Articles 4 and 5.

Article 4 included: The following are specifically considered protected literary or artistic works: "Written literary works, such as literary essays, scientific research, novels, stories, poems, and computer programs; oral works, such as lectures, sermons, sermons, and other similar works...".

In the same context, Article 5 also added other types of these works in the following text: “The following works are also considered protected works: translations, adaptations,..., editorial reviews...,”.

According to Article 160 From the text of the aforementioned order 03-05, the owner of protected rights or his representative, in accordance with the provisions of this order, may file a complaint with the competent judicial authority if he is a victim of the acts stipulated and punishable in accordance with the provisions of Chapter Six of this law relating to procedures and penalties, as follows:

- **civil litigation:** According to Article 143 of this order “The lawsuit for compensation for damages resulting from the unauthorized exploitation of the author’s work and the performance by the owner of the related rights shall be within the jurisdiction of the civil courts” .

- **Committing the Offense of Imitation:** The offense of imitation includes a series of acts, particularly those relating to scientific, literary, and artistic works, as referred to in the following sections of this article : A person is considered to have committed the offense of imitation when he does the following "Copying the entire work or a part of it, or reproducing it using any of the means, Translating the work without the permission of its owner , enting, selling, importing, or exporting counterfeit copies of the work " .

Section II

Protected Elements to ensure the integrity of scientific research in the context of digital transformation.

Ensuring the integrity of scientific research is linked to the protection of specific elements identified exclusively by the texts under analysis:

A) subtitle: Intellectual Property Protection in the context of digital transformation: This right is regulated, according to the texts under analysis, by the specific provisions contained in the legislation regulating scientific research activities, specifically the protection of moral copyrights, known as "authorship rights," and material rights, known as "publication and distribution rights."

It is also regulated by the general provisions referred to regulating intellectual property rights, particularly intellectual and literary property, which underpin the protection of copyright and

related rights in the field of scientific research, which are naturally distinct from industrial property rights. With regard to the measures to impose and consolidate this protection, the texts have identified it as relating to the following:

1- Protecting copyright and preventing academic plagiarism: This requires always citing the source (the source of the information). It is also necessary to promote and standardize the use of anti-plagiarism software in various fields of research, as explicitly stated in the ministerial memorandum on digital ethics under analysis.

2- Protecting copyright and distribution rights: Researchers have the right to decide How to Benefit from Their Work how their product will be delivered and financially exploited by users. Accordingly, users cannot take, modify, or share the product without the author's consent, especially in the digital environment, where the transition from traditional to electronic publishing has enabled increased circulation of digital works online.

B) subtitle: Personal Information and Data Protection in the context of digital transformation: This protection is based on elementary principles prescribed in the general provisions on it in the texts under examination. It defines its relationship with the university, where the latter is obligated to ensure the security of information and protection of personal data by requiring documentation, description, organization, and coordination of digital data according to conventional methods, forms, units, and descriptive standards accepted by the concerned community. It should be the preferred choice to use old-fashioned formats, particularly open formats, to facilitate access to data. In case programs or tools must be used in order to read the data, they should be mentioned To implement and enforce this protection, the following responsibilities have been set forth in the provisions herein studied.

1- Ensuring Data Security: Data security refers to the practice of protecting digital systems, infrastructure, and users from unauthorized usage, data theft, and other cyber assaults..

2- Ensuring the Accuracy of Information: All information resources available to users are the exclusive property of the university, as well as all information hosted by its systems or traversing its networks. All access to these resources and to the university's informational networks is thus subject to prior authentication procedures. Where these methods or resources fail, the responsible maintenance body should be notified as early as possible when using the internet.

3- Maintaining Data Quality: This is done by making sure that information is suitable, current, correct, unambiguous and comprehensible.

Conclusion:

At the end of this study we concluded that the measures taken by the algerien university to ensure the integrity of scientific research in light of the digital transformaton and artificial ntell igence consisted of modifying and developing traditional methots and readapting them to suit the new transformat ions in the fiend on the one hand and using innovative mechanisme that keep pace with the technical development taking place in the filed and are capable of facing the challenges of that development on the other hand, **this unsers the problem posed in the introduction by stating that:**

Guaranteeing the integrity and quality of scientific research during the time of digitalization and artificial intelligence requires the consolidation of ancient and modern mechanisms as above. Technical means and their application in detection of scientific plagiarism and academic malpractices alone cannot succeed. While these practices are necessary and helpful to a large extent in avoiding academic integrity violations and preventing intellectual property right infringement, they are not sufficient to deter offenders.

It is also not sufficient to entrust the scientific research integrity only to ethical norms and methodological regulations, though they play a crucial role as a personal vow and self-policing mechanism of the researcher, which binds him or her to uphold these ethics when infringements cannot be determined, and where law does not bind

them to do so under its codes. This, however, points to the underlying function of law in regulating this space and establishing the earlier mechanisms. It also points to the necessity of balancing the flexibility of the environment and its integration, which is regarded as the underlying guarantee. This is supported by the unearthed findings in the study Presenting and rationalizing the findings in relation to previous research on the subject to some extent

The results:

Present and justify the results by comparing them with the results of previous research that addressed some elements of this topic.

1- in terms of form: The structural analysis of the studied texts brought the following results:

1-1- The range of texts and scope differencen: between the overall texts that have been issued to establish compulsory provisions regulating rights and ensuring the freedom of individuals in various fields of activity, including the field of scientific research, such as provisions relating to protecting intellectual property and protecting natural persons when processing personal data, and the specific texts issued by the Ministry of Higher Education and Scientific Research as the regulatory body for the sector, which include special provisions that exclusively regulate scientific research activities within the university and manage its as a public services As an executive mandate, it is responsible for providing for digital transformation which will be implemented in the field of higher education and scientific research

- **Concerning the strength and nature of the text:** The strength of the text varies in accordance with its nature and source. Some of it is interpretive regulations provided in literary form, such as in the provisions organizing preventive mechanisms. There are obligatory rules associated with sanctions that regulate punitive mechanisms in terms of the protection of copyright and the protection of personal data — as the research in this subject has confirmed

- **Clarity of the text:** Legislative texts and charters differ in terms of phrasing, clarity, and definition of terms and methods. The texts under analysis are simple in wording and do not require interpretation. They have legislative instruments establishing certain principles, ethical standards, and provisions—clearly defined, for example, strategies and action plans in the field, and implemented programs based on clear strategies. They also define responsibilities, ensure the security of information and personal data, and uphold personal privacy, while limiting the use of technology and avoiding its misuse in the field.

1-2- Reason for issuing the text: It is linked to the circumstance which needs it, be it for rectifying or studying the text provisions to adapt to the digital revolution and the challenges that come with it. This is evident in the academic field, of this field of study, where such adjustment can be made through the enactment of new legislation or the modification of existing law to align it with digital transformation; Such as the University Code of Ethics, Publishing, which was updated in 2023 following its initial release in 2010, or the publication of new legislation by the organization pertaining to digital activities.

1-3- Content and substance of the text : This is stated in the provisions that such : texts have, which define the elements constituting the threat in question, and the protection needed in the field of digital transformation. It is particularly demonstrated in protecting academic integrity and fighting academic plagiarism, safeguarding scientific work against damage, and securing intellectual property rights . All this aims to preserve the integrity of scientific research, enhance its quality, and provide credibility between researchers, besides safeguarding their rights in this domain .

1-4- Grounds for issuing the text: In order to provide full protection (preventive and subsequent) for the right and for the factors threatening or compromising it, in light of the material and moral challenges brought about by digital transformation in the field of scientific research.

2- On the level of content: The objective analysis of the content of the texts and what they are loaded with in terms of general and essential concepts has significantly agreed with the findings of previous research into this topic, particularly in many of its aspects.

2-1- Traditional methods alone fail to protect academic integrity in light of digital transformation and artificial intelligence : The traditional means have failed to confront this phenomenon, either Legal procedures or through ethical awareness. The rapid growth and wide use of artificial intelligence tools under the digital revolution have brought about a new reality, which calls for the use of technological measures to counter it; Especially in the presence of tools that can detect academic plagiarism. Previous studies on academic research theft have indicated the importance of these tools ¹.

2-2- The Necessity to Enforce Digital Ethics in Accordance with Digital Transformation: Digital ethical awareness is a proactive action to ensure the purity of scientific research. Recently, the majority of universities, including those in Algeria under the authority of the Ministry of Higher Education, have moved in this direction, as illustrated through the analysis of the texts above, with the aim of converting technology into an effective tool for enriching scientific research. But practicality in the real world in Algeria has shown the limits of legal norms, and one of the most important guarantees—although not the sole one—to reduce the practice of academic plagiarism is digital ethics ².

Since awareness of ethics is a preventive and protective step for ensuring the integrity of scientific research. The majority of

¹ - CHELGHOUM samir, *Digitization as a mechanism to prevent scientific plagiarism, National Forum on: Scientific Research Methodology in the Age of Digitalization And Artificial Intelligence Technology: A New Challenge*, Faculty of Law, University of Algiers 1, April 13, 2023

² - Fatiha guergous, *(The ethics of scientific integrity in the age of digitization), National Forum on, Scientific research methodology in the age of digitization and artificial intelligence technology: a new challenge*, University of Algiers 01, April 30, 202, p: 137.

universities today rely on it ¹, to ensure academic integrity. This is what the Algerian University, under the supervision of the Ministry of Higher Education, sought to implement, which was confirmed by the content of the texts under analysis.

It is also proven by practical reality that legal texts alone are not sufficient to ensure the quality and integrity of scientific research. and restrict the phenomenon of academic plagiarism. Consequently, ethical regulation becomes one of the most effective guarantees in this era of digital revolution ².

2-3- The Role of the Legislative Environment: To ensure the effective realization of digital transformation, it is important to develop and enact regulations and procedures directing it in an organized manner. The regulations should provide protective legal clauses to ensure freedom of thought and intellectual property while establishing ethical and methodological boundaries of research activity within the digital environment. They should also address the legal, civil, and moral responsibility towards the use of digital technologies and tools in acquiring and sharing knowledge, specifically in the new field of artificial intelligence.

2-4- The Need for Supervision in Utilizing Digital Technologies and Artificial Intelligence: Whether in the educational environment or Administrative applications, use of digital technologies must be monitored—particularly to avert its exploitation for personal agendas, data manipulation, or accessing unethical or harmful content, such as websites promoting violence or discrimination. Monitoring is also necessary to ensure proper application of laws, policies, and regulations. These encompass

¹ - Nassima melek, (Electronic software mechanism to combat scientific theft summary), National Forum on, Scientific research methodology in the age of digitization and artificial intelligence technology: a new challenge, University of Algiers 01, April 30, 202, p: 395.

² - Wafaa fawzy, **Principles and Ethics of Artificial Intelligence**, PDF version, published by Al Bayan Center for Studies and Planning, Visited on 07/14/2024, at the following link:

<https://www.bayancenter.org/wp-content/uploads/2024/01/h3gv32.pdf>

tracking offenders, pursuing offenses—whether disciplinary or criminal—and imposing necessary sanctions.

The Ministry of Higher Education in Algeria seeks to implement the principle of "zero paper", for activating mechanisms of digital transformation and artificial intelligence in this sector. Due to the significant risk of generative AI—especially with its increasing replacement of human thinking within the arena of scientific research—the need to consider regulation must be recognized. Continuous use of those tools without preserving the human input in innovation and critical thinking requires the introduction of special laws to regulate their use and impose relevant penalties and criminal liability ¹.

This is consistent with international cooperation in the field, as also witnessed by the recommendations taken by the United Nations Educational, Scientific and Cultural Organization (UNESCO) General Conference at its 41st session in Paris in November 2021, on the ethics of artificial intelligence. The study is interested in examining the development of digital policies for artificial intelligence, more specifically in strategic frameworks. The frameworks are targeted at enabling vigorous and ethical deployment of AI systems in addition to ensuring a level of balance that is optimal between innovation and regulation.

The plan entails adopting global standards, especially in AI technical development. These are detailed strategies aimed at improving transparency, accountable use of AI, and ensuring inclusivity to different regions. Interaction with diverse stakeholders is at the core of developing a viable way forward for AI technology ².

¹ - Mohamed Hossam Lotfy and others, **Guide to the Ethics of Applications of Artificial Intelligence in Research**, published by the Arab Federation for Libraries and Information, Dar "Soham" for Publishing and Distribution, Constantine (Algeria), 2023, p :41.

² - *Ethics of Artificial Intelligence, The Recommendation on the Ethics of Artificial Intelligence*, issued by the United Nations Educational, Scientific and Cultural Organization (UNESCO), in its 2021 version and updated in 2022, was adopted

2-5- The importance of an appropriate infrastructure: no less important than the legislative environment, and is, in fact, one of its components. The infrastructure for information and communication technology includes three components: hardware, software, and networks. This has been given special attention by national authorities in light of national efforts to digitize many fields, including higher education and scientific research. This is particularly relevant in terms of digital training for newly hired professors at Algerian universities. In implementation of Joint Ministerial Decree No. 932, dated July 28, 2016, concerning the training and support of newly hired professor researchers, as amended and supplemented by Ministerial Decree No. 144, dated December 29, 2024 ¹, studies on this topic have indicated.

Also working on managing and promoting technological innovation. In the framework of “The Technological Innovation Management and Enhancement System”, it focuses on encouraging innovation and technological development through a systematic approach. incorporates diverse stakeholders, such as technical groups, lawyers, and financiers, in facilitating inclusion of innovative practices within the established frameworks.

This entails coming up with solutions to the issues confronting the sector, ensuring sustainability and ethical use of resources, and addressing the technical needs through collaborative networks ².

New frameworks for regulating the technology industries were also proposed to facilitate responsible development, and systems for monitoring the impact of the changes were put in place. The initiative,

during the 41st General Conference held in November in Paris, France. <https://unesdoc.unesco.org/ark:/48223/pf0000381137> .

¹ - Decision N°. 932 issued on July 28, 2016, and amended by the most recent Decision N°: 144 dated December 29, 2024, issued by the Ministry of Higher Education and Scientific Research, includes provisions on the methods of pedagogical accompaniment for the benefit of newly recruited professors, as well as their integration into scientific research and employment, Published on the official website, Ministerial Decision, PDF version.

² - Ben Ammar Souresh, “Education After the Digital Transformation at the University of Algiers,” *Journal of Islamic and Civilizational Sciences*, University of Algiers 1, Abu El Kacem Saadallah Center for Research in Islamic and Civilizational Studies, Issue 07, Volume 02, 2022, p. 271.

which commenced in 2016, has continued to move forward by adding new levels of integration with various sectors to make sure the ethical and technical specifications are addressed holistically. This includes a roadmap for future technology development.

recommendations:

on the basis of above results we offer the following:

1- Supporting the ethical rules related to digital ethics and scientific research ethics with binding legal provisions coupled with penalties (activating the principle of criminalization and punishment in this field), such as what has been criminalized for scientific theft, academic plagiarism, and electronic piracy in the fields of scientific research, and not being satisfied with presenting these rules in their literary form as rules of conduct merely for advice and guidance.

2- Employing technology and artificial intelligence techniques in the field of scientific research and controlling their techniques, and keeping pace with new ones in this field, in terms of training and controlling their use, as well as employing parallel technological techniques that enable the imposition of effective technical control over this use.

3- Simultaneous legislative regulation of the rapid technological development of everything used in scientific research and higher education activities, whether by amending the general legislation in force to be compatible with the digital environment, or enacting specific legislation to electronic transactions.

4- Activating administrative and punitive oversight mechanisms in this field, and continuously assessing the effectiveness of the oversight mechanisms adopted to monitor the implementation of legislative measures taken at the text level, to ensure the credibility of researchers and preserve their rights, thus encouraging them to produce scientific results and invest in their intellectual capabilities, the positive effects of which are evident in the integrity and quality of scientific research.

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- 2- Order No: 03-05, of July 19, 2003 relating to copyright and related rights, is concerned Published in Official Journal No: 44, du 23 juillet 2003, Ratified by Law No: 03-17, of November 4, 2023 Published in Official Journal No: 67, of November 5, 2003.
- 3- Ministerial resolution No: 1082 of december 27_2020, siting the rules for the prevention and fight against plagiarism, Official Bulletin of Higher Education and Scientific Research, Fourth Quarter 2020.
- 4- Decision No: 932 issued on July 28, 2016, and amended by the most recent Decision No : 144 dated December 29, 2024, issued by the Ministry of Higher Education and Scientific Research, includes provisions on the methods of pedagogical accompaniment for the benefit of newly recruited professors, as well as their integration into scientific research and employment, Published on the official website, Ministerial Decision, PDF version.
- 5- The University Code of Ethics and Conduct, issued by the University Ethics and Conduct Council, the official website of the Ministry of Higher Education and Scientific Research, visited on 07/14/2024, at the following link: <https://www.mesrs.dz/>
- 6- Memorandum on Digital Ethics, issued by the Council of University Ethics and Professional Conduct, official website of the Ministry of Higher Education and Scientific Research, visited on 07/14/2024, at the following link: https://services.mesrs.dz/cned/download/Note_sur_ethique_num%C3%A9rique_2_Aout_2023_ar.pdf

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