The reality of embodying the use of information and communication -technology at the Algerian University –Descriptive research -.

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Abstract:
The field of computer technology has witnessed an undeniable accelerating development in recent years. The latter is multimedia and the Internet in addition to the combination of the two of them which has led to the emergence of what is called information and communication technology. On the same token, this technology is rapidly impacting all life aspects, especially in the field of higher education.
Based on the above, the researchers aim to investigate the extent to which the Algerian University has adopted e-learning in light of the use of information and communication technology. To achieve this goal, the descriptive analytical approach was followed in showcasing the theoretical and empirical literature on the subject. It was concluded that the integration of e-learning at the Algerian University is still under experiment and undoubtedly suffers from difficulties related to weak infrastructure, low Internet service, and lack of training to use this technology by the active members in the field such as the lectures and students.
Keywords:communication technologies,higher education, the Algerian university, e-learning.

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1.Introduction

The world is currently witnessing one of the biggest digital transformations in the field of computer technology which imposed higher education institutions and global research centres to keep pace with this technical advancement through integrating technology into their educational and research systems due to its vital importance in raising their international quality ratings and moving them from importing ready-made knowledge to owning tools and means of creating and controlling it, given that the criterion of the progress of universities is measured by the extent to which they possess an advance technical informatics that helps them to store, distribute and manage this knowledge in a rational and effective manner that allows them to confront and keep pace with the scientific and economic changes taking place at the national and international levels.

This digital transformation requires the adoption of modern technological methods instead of the traditional ones that university education institutions used to rely on in the past when it comes to practising their various educational and research functions and serving the community in a comprehensive way. The so-called "knowledge society" derives its efficiency and effectiveness from the availability of an information base with advanced technology. Therefore, in light of this global digital battle and the digital gap that exists between the Algerian university and foreign universities, the latter is obliged to modernise the higher education sector. This is done by developing practical mechanisms and well-defined strategies that encourage the creation of a supportive and incubating educational environment for the idea of transforming from traditional

education to remote E-learning due to the global health crisis due to the spread of the Corona virus across the world, forcing all countries to accelerate the transition towards digital remote education.

Based on all of the above, the researchers will present in this study the statement of the problem in addition to its questions, objectives and the methodology and the rationale behind using it, then addressing the concept of information and communication technology (ICT) and its importance, characteristics and elements, the nature of information and communication technology in higher education and its indicators and standards, and the reasons for its employment, and then the reality of the use of information and communication technology in the Algerian university, with reference to the to the most important requirements for the embodiment of information and communication technology in the Algerian university and its challenges.

statement of the problem:

to what extent has the Algerian University adapted to information and communication technology ?

2.1. Research questions :

The researcher attempted in this research paper, to answer several research questions that can be summarised as follows:

-What is the nature of the information and communication technology in the Algerian university?

-What is the reality of the actual use of information and communication technology in the Algerian university?

-What are the requirements for integrating information and communication technology in Algerian universities?

2.2. Research Objectives:

The objectives of the study are the following:

-Defining the nature of information and communication technology in higher education institutions.

-Determining the obstacles and difficulties that stand in the way of the actual implementation of information and communication technology in Algerian universities.

-Identifying the requirements and mechanisms for activating the use of information and communication technology in Algerian universities.

2.3. The importance of the study:

The present study gains its importance because of the centrality of the role played by information and communication technology in the spread and activation of the educational process and the shift from the traditional in-person education to digital education that is conducted remotely. This shift makes education more efficient and effective which benefits the educational process so as to achieve quality in higher education.

2.4. Research Methodology:

The present study follows the descriptive-analytical approach, Furthermore, it relies on investigation of many previous studies from Arab and foreign sources that dealt with the subject of information and communication technology and its integration at the level of university which is considered as an educational environment that is in line with the economic and social aspirations, in addition to the attempt to understand and interpret the international assessments used in measuring the access of information and communication technology in higher education institutions and its comparison with the indicators set by the Algerian Ministry of Higher Education and Scientific Research as a reference guide

to identify the knowledge gaps separating the Algerian universities from developed countries in the field of digitization, advanced technology, and remote education in higher education.

2.5. Previous studies:

When it comes to the field of technology, It is known that there are many studies that have dealt with the subject of our study, whether from the same angle, or from different angles such as:

1. The study of Monia Zoukai and Houria Marsali from the University of Blida 02, entitled "Teaching social sciences at the Algerian University between the justifications of e-learning and the challenges of traditional education within the framework of higher education reform." It is an article published in the Journal of Facts for Psychological and Social Studies, the fourth and special issue, published on 01/10/2017 by Ziane Ashour University in Djelfa. The study aimed to find out whether e-learning represents an extraneous component in the social sciences, or is it an alternative approach to traditional education in these sciences. The study concluded that currently e-learning is the best way to accustom the learner to continuous education, which advocates for autonomy that enables the learner to self- teach for life. In addition to its vital characteristics like flexibility of time and ease of use.

2. The study of Aknoush Nabil and Ben Tazer Mariam entitled “E-learning and distance education at the Algerian University: A study of reality in light of the national project for distance education.” It is an article published in the Journal of Libraries and Information Volume Three, Issue 02 in 2010 about the University of Constantine 02. The study aims to reveal the increasing interest in electronic or virtual education in

the world with the information revolution, and to introduce it and its nature and its most important obstacles. The study concluded that the use of e-learning is still in its infancy, as this type of education faces obstacles and challenges, whether technical or educational.

3. The study of Qureishi Sami and Rifaa Sharifa entitled "The quality of e-learning in higher education as one of the requirements of the era of knowledge with reference to the efforts of the Algerian University." It is an article published in the Journal of Social and Human Sciences, Volume 08, Issue 01, issued by the University of Larbi Tebessi in Tebessa on 06/30/ 2015. The study aimed to highlight some of the facts and requirements for e-learning, the most important of which is its characteristics, tools, requirements and factors that must be provided to ensure the best quality. The study concluded that e-learning changes its users from consumers of knowledge to contributors to its production. It also found that there is a direct relationship between the level of technological readiness of the university and the effectiveness of the e-learning model.

3. The concept of information and communication technology, its importance and characteristics:

3.1. The concept of information and communication technology

For a better understanding of the concept of information and communication technology, we must first define the word technology. The latter was derived from two Greek words, which are (techno), which means art, skill, and craft. As for the other part (Logy), it is taken from the word (Loges), which means science or study. "The Arabic equivalent word of technology is "technologia" or techniques" (عبد العزيز، 2019، ص379)

Dr. Muhammad Ali Al-Din defines it as "the set of accumulated and available knowledge, experiences and skills, as well as the physical, organizational and administrative tools and means that a person uses to obtain verbal and visual information." (تومي،2006،ص52)

3.2 The importance of information and communication technology

It is an agreed upon fact that scientific and technological development has contributed to achieving the well-being of individuals. Among the developments that constantly happen are those related to information and communication technology, and its importance in terms of providing communication services of various kinds, education services and providing the necessary information to individuals and economic units, which makes the world a small village. People can communicate with each other easily and exchange information at any time and anywhere due to technology. This importance due to its characteristics including the widespread and endurance capacity, both in relation to the number of individuals participating or communicating, or in relation to the volume of information transmitted. It is characterised by fast performance, ease of use and diversity of services.(عاصم،2013، ص334)

3.3.Characteristics of information and communication technology:

The field of information and communication technology has a lot of great characteristics such as:

-ICTs contribute to economic development through the digital revolution that leads to the emergence of completely new forms of social and economic interaction leading to the emergence of new societies.

-Increasing the ability of individuals to communicate and share information and knowledge increases the chance of the world becoming a

more peaceful and prosperous place for all its inhabitants. This is if all individuals have the potential to participate and benefit from this technology.

-ICTs enable marginalised and isolated individuals to integrate into the global community, regardless of their gender or where they live. It helps to reconcile power and decision-making relationships at the local and international levels.

- Information technology is characterised by concurrency, which means that the message can be received at any time convenient for the user.

3.4 Elements of Information and Communication Technology

Information and communication technology contains a set of elements that are constantly evolving as a result of the continuous demand for it, especially in the current era, which is titled as the era of advanced and fast technology. The elements of ICT are as follows:

-Machines: They are characterised by quick implementation capabilities and cheaper cost with capabilities that are higher than human capabilities. In other words, by machines we mean all types of existing computers, whether they are large-sized, small computers or personal computers.

- Software: It is defined as language and the means by which the beneficiaries deal with the data stored in the machines, and through which these data are stored, recalled and run. The programming language has witnessed great developments and this explains its diversity and abundance.

- Networks: networks allow the exploitation of the capabilities of remote communication, which makes the various components of the national

information system exchange information with ease. It also provides the beneficiaries of the national economic information system with the possibility of communication with its various components.

-Mechanism: in the context of ICT, mechanisms refer to the use of machinery such as robots, in some fields, instead of humans, and this does not mean that humans can be 100% dispensed.

- Silicon chips: They are a very small electronic brain that performs one specific function according to a specific program, and it is included in the manufacture of computers. (يحي ،2006، ص85 -86)

3.5 The nature of information and communication technology in higher education:

In the context of higher education, Information Communication Technology (ICT) is defined as "the science that is concerned with storing, retrieval, processing, and broadcasting information using computers. The International Encyclopedia of Information Science and Libraries" defines it as the electronic technology necessary to collect, store, process and communicate information. It includes physical tools and digital resources that can be employed for educational purposes (ضيف الله، بن زيان،2017، ص207)،

while the UNESCO report (2002) emphasised that ICT in higher education “can be considered a mixture of “information technology” and other related technologies, especially communication technology and different types of information technology products. The available communication that is related to education such as teleconferencing, e-mail, audio conferences, TV lessons, radio broadcasts, IVR system, audio

tapes, CDs, etc., which are used in education and for various purposes (Manichander, 2016, p207).

3.6Indicators and standards for measuring information and communication technology in higher education:

The Geneva presentation of the World Summit on the Information Society in 2003 demonstrated the importance of setting standards and measuring progress towards the information society using internationally comparable statistics. (الاتحاد الدولي للاتصالات،2010، ص1)

where countries that are still in the early stages of introducing ICTs differ in the information they need from those that have a longer experience in the field of technology. For instance, when introducing computers into education,, it is important that lecturers and students have access to hardware and software, and that they acquire basic computer skills.

As for the countries that have made greater progress in the levels of ICT use in education, they have other priorities at the fore, such as managing educational innovation, adapting and inclusive curricula, organisational change, sustainable technical support and continuing educational staff development. As a result, policy makers' interests have shifted over time. Some believe that measuring the effects of ICT application in education requires information on connectivity, use, and outcomes.

On the same line of thought, it is necessary for others to focus at the beginning of the application of this technology on establishing an information and communication technology infrastructure in order to provide schools with access to the latest technologies, and in the next stage, the focus begins on the appropriate way to use information and communication technology in order to achieve the desired educational

results. An example of a common conceptual framework for ICT in education, it provides a useful basis for assessment and policy monitoring mechanisms(معهد اليونسكوللاحصاء،2009،ص21))

as it is clear that integrating information and communication technology in higher education requires intensification of efforts and the availability of many factors, including: factors of the system as a whole, which are represented by other higher education institutions, factors of higher education institutions integrated in them, technology without neglecting the characteristics of both students and professors, while dealing closely with learning outcomes. (ضيف الله،2017، ص87)

As a conclusion, in order for the integration of ICT into educational systems to be effective, an appropriate blend of policy and procedural measures is needed, represented in the following:

- Clear objectives and a policy environment for national authorities to support the use of ICTs in education.
- Provide incentives for both public and private educational institutions to purchase ICT facilities such as: government funding, budget allocated for maintenance services, tax cuts, research investment or sponsorship to develop low-cost ICT hardware and software....etc.
- Adapting the curricula to suit the process of integrating information and communication technology with it, and developing digital educational content and standard quality-assured educational software. (معهد اليونسكو للاحصاء،2009، ص23)

Based on the above, it is clear that the use of information and communication technology in education has three stages:

- The first stage: determining the goal of the education policy.
- The second stage: determining the requirements for the use of information and communication technology in order to achieve the objectives of the higher education policy represented in: providing infrastructure, training teachers, developing educational curricula and providing digital content.
- The third stage: assessing students and monitoring results from various aspects of influence to improve the educational process, improve scientific research, and develop society. (ضيف الله،2017، ص88)

4. Reasons for the integration of information and communication technology in higher education:

It is undoubtedly that the university is no longer confined in its objectives to conducting research and qualifying specialists in various fields, rather it has varied its goals to focus on continuous education and provide its services to the community through its use of modern technological means in the learning process for the following reasons:

- The development of higher education: this development has several dimensions, as it involves the desire to lay the foundations and rules of renewal, due to the radical changes that have occurred in the systems in various fields, where higher education has been linked to the daily concerns and needs of the citizen and society, which requires a review of the University jobs and how to provide appropriate outputs for the labour market.
- Efficiency and effectiveness of the higher education system: which is the suitability of the higher education system to educational goals. The achievement is better, as it increases the effectiveness of education

through new contents and modern technological methods that facilitate learning. (شابونية وأخرون،2012، ص400)

- Economic globalisation: which is accompanied by the breaking of traditional barriers between markets, and the generalisation of some patterns of consumer behaviour to all societies, on the disparity of prevailing cultures and the varying standards of living in them.
- Developing work methods and methodologies: It calls for the need to increasingly resort to specialised skills and diverse experiences in order to operate these technologies and manage these methods. (عاصم ،2013، ص234)

5. The reality of the use of information and communication technology in the Algerian University:

In the "Priorities and Planning Report for the year 2007" which was planned in September 2006, the Ministry of Higher Education and Scientific Research published the "Strategic Objectives 2007-2008-2009" which contains two strategic goals with regard to information and communication technologies are:

- Preparing the higher education sector for the integration of the media system.
- Establishing a distance education system as a pillar for the attendance training.

This research paper deals with the second objective related to the establishment of a distance education system as a pillar for the presence of training in the world of distance education. Various technologies which are available in the market are similar, and through this premise, the Ministry of Higher Education and Scientific Research since 2003 started

to equip all institutions with specialised distance education equipment, at a total cost estimated at 716,152000 DA. The distinguishing feature in the process is the strategic choice regarding the use of these equipment, which takes into account its compatibility with global academic needs and is in line with our national peculiarities at the same time, which is what determines the selection of our strategy for distance education.

Distance education is considered as a supplement for the traditional classroom education, as it supports and strengthens it. While in other countries (developed), it is considered as one of the options granted distinctly to the learner.

This approach allows our country to rise to a challenge in achieving the following goals:

- Absorbing the ever-increasing numbers of learners, and accessing a gradual bypass simultaneously have raised the inverted pyramid that currently characterises the lectures (the quantitative criterion).
- Improving the quality of training and quickly approaching international standards in terms of quality assurance (qualitative standard). (وزارة التعليم العالي والبحث العلمي، 2020).

In order to achieve this goal, an agenda has been set for the short, medium and long term that reflects the immediate, medium and somewhat long-term concerns, as follows:

-<u>The first step</u>:

The first step towards integrating online learning into the Algerian universities is the stage of using technology such as teaching through video-platform in order to absorb large numbers of learners, with a tangible improvement in the level of education and training (a short-term

context) through the establishment of a network of video lectures, integrating all university institutions, including 13 transmitter sites and 46 future sites .(عنكوش وأخرون،2016، ص.163)

Although this network allows recording and indirect broadcasting of lessons, it is used mainly in a simultaneous form, which requires the accompanying attendance of the lectures, the technician and the students. Furthermore, the network can currently be exploited in the form of "point by point".

Once the installation of equipment and capacity building is completed (the process is underway), the system can collect 18 visual lectures simultaneously, thanks to a central node and six multi-site units, placed in the Research Centre in Scientific and Technical Media, and the network has been expanded starting from university entry 2009-2010, towards preparatory schools that have also been provided with virtual laboratories and multimedia classrooms connected to a private network for video lectures, and there is a parallel stage, or at least a little late, represented in the development of an e-learning system.

The second step:

The second step towards the integration of distance learning in the Algerian universities is to depend on modern pedagogical technology, especially on WAP (online learning or e-learning), in order to ensure quality (a medium-term context) through the development of an e-learning system based on a distance education platform in the form of (customer-distributor) (client-serveur) which allows setting up and accessing online resources, in asynchronous form and the learner can access this system anytime anywhere, with or without facilities. This rule allows teachers to

use various online methods (lessons, exercises, Practical lessons, training activities, etc.), and provides the base for the learner with a rich, varied and permanent pedagogical medium. (عنكوش وأخرون،2016، ص164)

The university system, despite the great reforms made by the ministry, the Algerian university in the light of the third millennium is facing technological development with weak capabilities, especially since the world is going through a great revolution in the field of communications and information, which forces it to reconsider the content of its educational system, and the value of the budget dedicated to the field of scientific research, which is estimated at less than 1% of the total output, as the available figures indicate that the information market is estimated at about 10 to 12 billion dinars, in which equipment constitutes 99 % of this market, and only 1 % remains for research, and that Internet access to Algeria is still so weak that only 1% to 2% have connection with this modern medium.

A field study conducted by Professor Jamal Bin Zarrouk at Annaba University in cooperation with the French University of Strasbourg, on a sample of teachers and students of the faculties of arts, humanities and social sciences at the Universities of Annaba and Algiers, showed that the employment of Algerian university teachers for modern media technology is very limited, as distance education is only practised by 06 % of professors, while the percentage of old information system users is 87% of professors, and the researcher added that only 50% of the sample have the ability to connect with the Internet from their place of residence, while 17% resort to Internet cafes, as his study showed that 60% of the sample

lectures do not have special forums and websites on the "web" to express their ideas and exchange scientific information. (طلحي،الشريف،2014)

This was confirmed by (سامندر ، سينغ،2017،ص46) study which argues that the teaching assistants suffer from the feebleness of these structures, especially technical knowledge and technical pedagogical knowledge, and the reason for this is that most of the assistant faculty members in the sub-campus graduated from institutions of higher education when technology was not fully introduced into their curricula, at a time when education and practice were limited to basic computer skills using Microsoft Office applications. However, computer skills courses are not sufficient to teach online courses effectively, and many researchers have warned that basic computing skills form the cornerstone of ICT knowledge, as these skills are insufficient to prepare faculty members to integrate technology into online education as it is usually taught in isolation from the educational context.

As for students, the study showed that most of them use these modern technologies for personal purposes, and rarely use these technologies to communicate with their teachers to obtain information. (طلحي، الشريف،2014), in addition to the financial difficulties which are an obstacle to the use of technology, as the project of employing information technology in higher education requires significant financial costs.

6.Requirements for the integration of information and communication technology in the Algerian university:

The integration of educational technology in the university is not an easy matter, for the reason that it demands a gradual introduction of technology

which requires patience and perseverance and includes the entire process of learning and education.

In addition to that, the subject of its integration does not come from a political decision or an official letter, but rather requires full conviction on the part of all educators, and on their various positions, of its importance and the need to view it as the real tool for the development of higher education. (عامر، قسمية،2011) and accordingly, in order to activate the use of information and communication technology at the Algerian University, some requirements must be met, including:

- Disseminating e-learning techniques in educational institutions and attempting to reduce the digital gap, as the majority of educational and university institutions lack the necessary infrastructure (electronic readiness) to provide e-technical education services.

-Establishing electronic portals and activating virtual classrooms because of their prominent role in linking the learner to various sources of knowledge, as the learning process has a profound impact in rooting the research concept of the educational process.

- Activating the role of the private sector through the concept of community partnership for development and knowledge building. The private sector had a pioneering role in the introduction and use of technology, and in order to benefit from its capabilities, its role must be activated through the concept of "community partnership for development"(الغامدي،2012، ص388)

-The development of infrastructure related to technology and scientific research outputs in Algeria requires the existence of an enabling political, social, economic and legal environment in line with global trends

in the field of scientific research and technological development, especially at the level of human resources (عظيمي،2019، ص171).

-Encouraging e-learning experiences in the university environment by knowing the concept of e-learning, its philosophy, and the educational strategies based on it among those in charge of the university in question, and then analysing this concept by comparing its compatibility with the corresponding concepts of e-learning, and studying the infrastructure to determine its ability to contribute to achieving goals and conducting the plan, and determining its scalability for development and expansion as required by the plan's stages and requirements for development in e-learning . (لموشي،2016).

-The smooth transition through knowledge of the electronic and digital system of transactions in the management and research projects which is one of the most important determinants of improving the quality of scientific publishing in order to increase the efficiency of the scientific and applied outputs of these projects in order to achieve competitiveness and raise the level of research projects as one of the pillars of the academic evaluation.(الصاوي،2017، ص84)

-Working to provide research databases as additional university library services, and a broad base of information in the academic department for the benefit of lectures and graduate students alike. (بلبكاي،2016، ص30)

- Establishing a national observatory for the information society in the education sector that would allow access to information and

communication technology in this sector, with the identification of indicators related to information technology in the education sector. The educational institution in Algeria keeps pace with the change imposed by the transition to the information society. (علوي،2008، ص18)

- The necessity of enabling students and researchers to access digital technology to conduct scientific research by having workshops and training courses to control the various aspects of these fields.

- Enhancing digitised cooperation between various universities and research centres, by exchanging databases and establishing cooperation links between researchers.

-Working on developing anti-theft software, and exchanging expertise and experiences between universities and research centres(لخضاري، 2016، ص175).

Conclusion

It is without a doubt that online education will flourish and spread due to the convenience and flexibility it provides for the student and the lecturer at the same time. Teaching through modern technological media contributes to achieving classroom fun, qualitative benefit to the student, and the adoption of the digital curriculum which saves time and suits technological development. However, it does not mean a decline in the roles and powers of the lecturer. On the same token, despite the teachers' fear of being marginalised and reducing their role in the educational process, the digital university will not cancel the lectures's role, but will support them and give them other essential roles within e-learning like managing the pedagogical interactions that these media allow. The most

important advantages and benefits of e-learning are showcased in the possibility of increasing communication between students themselves, and between students and the university, for the reason that digital education encourages cooperative learning and teamwork. The latter demands better communication between learners. It also provides education for people whose nature of work and special circumstances do not allow them to attend university. In addition to that, it allows the possibility of adapting the teaching method and receiving the scientific content in a way that suits the student. E-learning and its sources allow the possibility of applying the resources in many different ways according to the method that is best for the student, which contributes to taking into account the individual differences between students, and most importantly, it ensures the expression of the students' different points of view thanks to instant forums such as discussion boards and dialogue rooms which gives a sense of equality since the communication tools allow each student the opportunity to express their opinion at any time without embarrassment.

The researchers have attempted, through this research paper, to investigate the reality of the use of information and communication technology in higher education institutions and ways to integrate them.

Based on the results of this study and related literature on the application of information and communication technology in higher education, it was found that thelectures are sufficiently familiar with the concept of e-learning and have sufficient knowledge of the most important related concepts, which allows to say that theoretical knowledge of this modern technology does not represent an issue for the lectures due to their familiarity with the related publications in scientific journals and books, in

addition to the fact that they use these techniques in their teaching as well as in their academic research.

The challenges faced by the integration of e-learning at the Algerian university can be summarised in the following points:

- feeblity of the universities' websites, failing to update them constantly and not organising them, due to the lack of specialists in this field.
- The lecture's lack of awareness, as well as his/her lack of interest in this type of education due to the absence of interest on the part of education officials in this type of education because they belong to the traditional education generation.
- The university's lack of interest in this type of education, and the fear of its integration by the education officials due to hersenning all the capabilities of this type of education.
-Students' lack of desire for this type of education due to their preference of ready-made lectures and the traditional method because it is considered as effortless on the part of the student who only wants to receive.

Research recommendations:

The results of the present study indicate that the success of the shift towards e-learning demands certain characteristics. In other words. In order to expand information and communication technology the following recommendations should be taken:

1. The necessity of paying attention to training the teaching community of Algerian university, including lectures, students and administrators, on how to use technology in general and higher education in specific.

2. Increasing the budget of higher education in order to develop e-learning, provide its requirements and ensure its success.

3. Expanding the use of e-learning even outside times of health crises, and considering it as a supplementing pattern to the traditional, face-to-face education.

4. Raising awareness of all members of the university community about the importance of this new type of education in light of the dominance of information technology and the widening of the digital divide between developed and developing countries, including Algeria.

5. Giving attention to ensuring the provision of a high flow speed of the Internet in order to ensure the adoption of the e-learning style and to ensure its effectiveness.

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