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Digital transformation of higher education organizations in the context of the knowledge society

التحول الرقمي لمنظمات التعليم العالي في ظل متطلبات بناء مجتمع المعرفة

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الملخص:

هدف هذه الدراسة إلى تقييم دور وإسهامات الجامعة الجزائرية في تحقيق مجتمع المعرفة في ظل التحول الرقمي، باعتبارها منظمة حاضنة للرأس المال المعرفي، ومن أهم النتائج التي توصلت إليها الدراسة أن مواكبة التطورات العلمية في الجزائر تبقى بطيئة وبعيدة عن تحقيق متطلبات مجتمع المعرفة ومواكبة العصر الرقمي. وفي ضوء هذه النتائج توصي الدراسة بضرورة وضع استراتيجيات وأهداف جديدة تتوافق ومتطلبات التكنولوجيا الرقمية، ومعرفة الصعوبات والعراقيل التي تواجهها الجامعة الجزائرية في تحقيق رسالتها.

الكلمات المفتاحية: التحول الرقمي، مجتمع المعرفة، الكفاءة الرقمية.

Abstract:

This study aims to assess the role and contributions of Algerian universities in the achievement of a knowledge society in the era of digital transformation. As incubators of knowledge capital, the study shows that scientific progress in Algeria is still lagging behind and does not meet the requirements of a knowledge society and keep pace with the digital age. Based on these findings, the study recommends the development of new strategies and objectives in line with the requirements of digital technology, and identifies the challenges and obstacles that Algerian universities face in fulfilling their mission.

Keywords: Digital transformation, knowledge society, digital literacy.

Introduction

Universities have long held and continue to hold a prestigious position in society. They are centers of intellectual and cognitive radiation, serving as fundamental pillars for the development and progress of nations. Universities occupy the pinnacle of the educational hierarchy in society and are regarded as the leading intellectual and conceptual tool for their institutions. They play a vital role in preparing competent individuals, honing their skills and serving as factories for cultivating the nation's elite through their contributions to the training of intellectuals, professional leaders and researchers. However, higher education institutions are facing challenges brought about by digital transformation. Teaching methods and research activities are evolving in line with this digital revolution, posing a major challenge for universities to achieve distinctive intellectual capital.

From this perspective, our study addresses a very important issue: assessing the role and contributions of Algerian universities in achieving a knowledge society in the context of digital transformation, and the key challenges they face in fulfilling their objectives as social institutions that foster intellectual capital. Universities have a responsibility to provide society with qualified individuals, who are a valuable resource and a true wealth for the nation.

Research Problem:

Higher education institutions strive to achieve a set of goals and objectives aimed at meeting society's needs for skills that are the end result of academic, scientific and administrative activities. These institutions are seen as key indicators of progress and development for nations, particularly through their leading role in driving scientific and technological advances. Their mission is to produce, develop and serve knowledge for the benefit of society and to provide the labor market with highly qualified individuals trained to the highest standards. Universities are the institutions where knowledge is created, nurtured and flourishes, as they meet the needs of its production and application. The knowledge society is closely linked to universities because of their key role in providing the distinctive and cutting-edge skills, intellectual capital and knowledge that form the basis for building a knowledge society.

The revolution in information and communication technology has brought about significant advances in societies, making the world a small village by breaking down barriers. Today's society is characterized as an information and knowledge society as it interacts and develops in accordance with the information revolution, where information flows effortlessly without significant effort or high cost. As a result, it has become essential for making informed decisions and plays a vital role in the progress of knowledge-based societies by effectively producing and using knowledge in all areas of activity.

Communities have increasingly made knowledge a primary strategic and operational objective in the management of their affairs. Higher education institutions play a key role in achieving and building a knowledge society by providing an appropriate educational environment, fostering creativity and excellence among faculty members and raising their level to ensure the quality of university output, which consists of outstanding and innovative students with high scientific and knowledge competencies in various fields. In addition, emphasis is placed on the development and

improvement of students' skills by providing a supportive academic and organizational environment that fosters their scientific growth.

The high quality output of competent and skilled students is at the forefront of the knowledge society and represents the main and essential objective of the University. This is accompanied by a commitment to the promotion of scientific research and its development. In this context, we will try to assess the role and contributions of Algerian universities in the knowledge society in the era of digital transformation. As organizations and social institutions that foster intellectual capital, universities are expected to provide the necessary scientific and organizational environment to achieve a knowledge society.

This evaluation will address the following questions:

- To what extent has the Algerian university achieved the quality of its outputs.

- To what extent does the Algerian university provide the scientific and organizational environment for a knowledge society in the digital age?

- Has the university succeeded in achieving its core objective of preparing highly competent and qualified students?

- How does the pedagogical and scientific mission of university professors contribute to building intellectual capital?

- Does the digital transformation pose a challenge to the university professor as the focal point of the educational process?

- How does this transformation affect the outputs of the university?

The hypotheses of the study:

Hypothesis 1: The pedagogical and scientific mission of the university professor is fundamental to building intellectual capital, which represents the forefront of the knowledge society.

Hypothesis 2: The integration of university professors in the digital age contributes to ensuring the quality of university output, consisting of students with cutting-edge scientific competences in various fields.

Hypothesis 3: The organizational environment of the university contributes to building a knowledge society in the context of digital transformation.

Significance of the study:

This study derives its importance from the challenges and stakes posed by the transition to the digital age, where pedagogical and educational methods are evolving in line with this digital revolution. Consequently, it has become imperative for universities and university professors, as the focal point of the educational process, to integrate themselves into the digital age by using e-learning systems and applying artificial intelligence applications in higher education. This is a challenge for universities to provide the skills and distinctive intellectual and knowledge capital that are at the forefront of the knowledge society, given the digital divide and the lack of technological resources in Algerian universities compared to developed countries.

Aims of the study:

The objectives of this study are as follows:

- To examine the integration of university professors and universities into the digital age.

- To examine the contribution of university professors to the building of competences through their knowledge acquisition and research performance, as they are the core of the educational process and the foundation for building a knowledge society.

- To clarify the impact of the organizational environment of the university on the scientific and pedagogical roles of university professors, including the provision of a scientific and pedagogical environment and supportive resources for scientific research and knowledge acquisition.

- To assess the adaptation of Algerian universities to the requirements of building a knowledge society in the digital age.

Methodology of the study:

The study uses a descriptive-analytical methodology to describe the digital reality of Algerian universities and to identify the main challenges and obstacles hindering the achievement of a knowledge society. In addition, quantitative methods will be used to measure the phenomenon and express it in percentages.

2. Conceptualization:

2.1 The organizational environment of the university:

In our study, the organizational environment refers to all activities within the university framework, such as conferences, seminars, study days and all scientific events. It also includes the scientific and technological resources and the conducive conditions that support the professor-researchers in their research performance.

2.2 Academic performance of the professor:

The scientific role is considered as the primary task of the university professor and is manifested through research activities that contribute to the development and improvement of their scientific and knowledge level. This has a positive impact on the quantity and quality of the information they impart to students through their performance.

3.2 The professor's teaching performance:

The pedagogical or teaching role of the university professor refers to their academic teaching performance, which has a significant impact on the academic, intellectual and ethical achievement and growth of university students.[1] It involves cognitive interaction between university students and the professor with the aim of transmitting values, ethical principles, positive attitudes and social and cognitive maturity.

4.2 Digital literacy of the university professor:

Digital literacy is defined as a set of knowledge and skills to use digital devices and technologies effectively and efficiently, enabling individuals to manage and share digital content in creative and efficient ways. It leads to increased accuracy and quality in all aspects of public and professional life.[2] Therefore, the digital literacy of the university professor includes his or her cognitive and emotional skills in the area of educational technology that enable him or her to use devices, machines and software.It also includes the set of cognitive skills required to use networks, digital devices and various applications on the Internet

5.2 Digital technology:

Digital technology is defined as the process of encoding specific information, such as images, audio or text, into binary codes. These are long strings of numbers that can be

stored and decoded by a computer. These binary codes can also be compressed to store large amounts of information on small storage devices.

It is also defined as the embodiment of scientific achievements in practical applications that involve a shift from traditional systems to digital systems. It includes computers, the Internet, mobile phones, fixed lines, satellites, interactive television and other technologies.[3] Digital technology includes computer hardware, software, both traditional and interactive applications, communication networks and their components, and databases. In a very short period of time, this technology has volved to become smaller and faster.[4]

6.2 Knowledge Society:

The knowledge society is defined as a society based primarily on the dissemination, production and efficient use of knowledge in all spheres of social activity: economic, civil society, political and private life, with the aim of constantly promoting human development.[5]

It is also a group of people with similar interests who try to benefit collectively from their accumulated knowledge in the fields they are interested in. It is also defined as a society that priorities knowledge in its planning and application in various aspects of life, improves the use of knowledge in its affairs, and makes sound and wise decisions. It is a society that produces information to understand the backgrounds and dimensions of various issues worldwide.[6]

In addition, it is defined as an integrated specialised programme that combines education, science, culture and communication into a cohesive and integrated unit with multidimensional knowledge.[7]

Based on the previous definitions, it can be inferred that the knowledge society refers to a society that relies primarily on knowledge as a fundamental wealth, emphasizing the expertise, knowledge, and skills of human resources as the basis for human and social development.[8]

3. Theoretical approach to the challenges of the Algerian university in achieving a knowledge society and building competences:

Today we live in a constantly changing world, surrounded by an immense and infinite amount of information. This is the phenomenon of the digital age, which has penetrated all aspects of our daily lives and disrupted our routines. Individuals now rely heavily on the use of communication technologies, specialized software, the Internet and digital technology in their communications and activities. Higher education has not been immune to this invasion.[9]

Education is no longer limited to the exchange of information, but has become a digital platform for learning, interaction between professors and students, and communication with the administration regarding all pedagogical and research activities. Through this study, we aim to shed light on how university professors integrate into the digital age by changing their methodologies to adapt to the demands of digital technology, taking into account the digital gap and the lack of technological resources in Algerian universities compared to developed countries. We also seek to explore the reality of professional and continuous training for university professors and their role in enhancing their digital literacy, as well as the extent to which higher education institutions are adapting to the digital age. This can be achieved by [9]technology, in order to strike a balance between what can be taught remotely and

what needs to be preserved through physical presence. This oscillation between the virtual and the physical remains the greatest challenge for the university.[10]

The use of digital technology in the educational process has placed additional burdens on education. Its use has been met with negative attitudes from some professors due to a lack of clarity about its importance and benefits. They feel that face-to-face communication with colleagues to discuss ideas and make decisions is being compromised. In addition, many professors lack control over the use of modern technology and there is a lack of training on the software and technologies used by the university. Distance learning platforms are often a challenge for older people who have not been exposed to technology in their academic curriculum. In addition, limited access to the Internet, the absence of dedicated forums and websites for exchanging ideas and addressing concerns related to technical knowledge, and the lack of adequate financial and moral incentives and encouragement contribute to these challenges.

It is the responsibility of researchers and those interested in educational technology to identify the main barriers and challenges to the use of digital technology in education. They should examine its impact on the effectiveness and performance of higher education institutions and on the quality of education. Research should also focus on how to change teachers' attitudes towards digital technology.[11]

In addition to focusing on the needs of building a knowledge society, providing an appropriate educational environment is crucial to achieving excellence in various sciences that contribute significantly to building a knowledge society. This can be achieved by providing computer equipment and intensifying training in universities in various disciplines. It is also important to focus on the educational process by introducing and renewing educational programs, plans and curricula in line with the latest global technologies.

There is a need to priorities the faculty members of the university as they are the cornerstone and backbone in fulfilling the university's mission of education, scientific research and public service. This can be achieved by encouraging creativity and excellence among the faculty members, believing in the importance of enhancing their performance to ensure the quality of the university's output in terms of exceptional and skilled students with vast scientific and knowledge capabilities in various fields. This can be achieved by providing bonuses, incentives and a range of benefits to ensure the quality of performance

In addition, it is essential to focus on students' abilities and work to improve and develop them by providing a stimulating scientific and organizational environment for their scientific growth.

The quality output of students with exceptional abilities should be the main and essential goal of the university. Finally, it is necessary to improve and develop scientific research, as continuous scientific research is the basis for building a skilled and integrated knowledge society. This can be achieved by:

- Diversifying funding sources to support scientific research.

- Establishing research centers.

- Strengthening the role of promising research centers and supporting them through funding.

- Promoting seminars, conferences and study days that open the door to knowledge acquisition and skills development through discussion, exchange of experience and expertise.

- Attract excellent students and professors and encourage excellent research.[12]

4. Field study:

1.4 Study sample:

We used purposive convenience sampling to reach professors from the universities of Blida 1, Blida 2, Algeria 2 and Algeria 3. The faculties and disciplines were identified in order to assess their opinions on the university's achievement of a knowledge society. This was done by examining the availability of a suitable scientific and educational environment and the support provided to university professors in terms of resources and training. The questionnaires were distributed during the examination period of the 2022-2023 academic season to ensure the presence of professors at the university.

The distribution process was supported by our fellow professors at the aforementioned universities, and a total of 200 questionnaires were distributed, with 50 questionnaires per university. We received 165 completed questionnaires. The study population included both lecturers and assistants.

Table (1)

Shows the distribution of individuals in the research community according to the colleges and departments of the university.

Colleges		**Number of Professors**	**Percentage**
University Blida 2	Faculty of Legal Sciences	14	8.48
	Faculty of Economic Sciences	15	9.09
	Faculty of Arts and Languages	16	9.69
Total		45	27.27
University Blida 2	Faculty of Natural and Life Sciences	13	7.87
	Faculty of Exact Sciences	12	7.27
	Faculty of Engineering	17	10.30
Total		42	25.45
University Algiers 2	Faculty of Foreign Languages	10	6.06
	Translation Institute	15	9.09
	Archaeology Institute	12	7.27
Total		37	22.42
Colleges		**Number of Professors**	**Percentage**
University Algiers 3	Faculty of Information and Communication Sciences	12	7.27
	Faculty of Political Science and International Relations	16	9.69
	Faculty of Economic, Commercial, and Management Sciences	13	7.87
Total		41	24.84
Overall total		165	100

2.4 Data collection instruments:

The data and field information from the researchers were collected using a questionnaire form. Given the nature of the topic and to ensure better efficiency, the questionnaire included a variety of closed and open-ended questions that allowed for statistical analysis of the data using indicators and percentages. A total of 165 questionnaires were returned. The questionnaire consisted of 23 questions divided into three dimensions.

3.4 Data presentation and analysis:

1.3.4 Socio-demographic and professional characteristics of the sample:

Table (2)

Distribution of the sample by gender and age.

Gender / Age	Female		Male		Total	
	Frequency	%	Frequency	%	Frequency	%
Less than 30 years	9	40.90	13	59.09	22	13.33
30 - 39 years	12	44.44	15	16.66	27	16.36
40 - 49 years	21	44.68	26	26.88	47	28.48
50 years and above	33	47.82	36	52.17	69	41.81
Total	75	45.45	90	54.54	165	100

The table shows the distribution of the sample by age and gender. The number of female professors in the sample is 75, compared to 90 male professors, out of a total sample size estimated at 165 practicing university professors in educational and scientific roles. The table is divided into age categories, starting with the youngest age group, defined as under 30 years old, while the oldest age group includes professors aged 50 and over.

Looking at the table, the highest percentage of professors is concentrated in the 50+ age group, estimated at 41.81% of the sample, followed by the 40-49 age group with 28.48%. The next category is the age group 30-39 years, estimated at 16.36% of the sample, and finally the smallest percentage, 13.33%, belongs to the age group of professors under 30 years.

In terms of gender, the highest percentage is recorded for males, with a percentage of 59.9% in the under-30 age group, compared to a percentage of 47.82% for males in the 50+ age group.

Reading the statistics in this table, we can see that male professors outnumber female professors in the research sample. As far as age is concerned, we can see that the majority of the sample is not very old. The age factor cannot be ignored, as it plays a role in the effectiveness and efficiency of the professor and their ability to perform their duties to the full. This can be justified by the development of Algerian universities, which has allowed the recruitment of a large number of professors in the later stages, and the opportunities given to young talents to unfold their educational potential and express their skills.

Table (3)

Distribution of the sample by marital status.

Marital Status	Frequency	Percentage
Single	34	20.60%
Married	131	79.39%
Divorced	_	_
Widowed	_	_
Total	165	100%

The above table shows that the majority of the sample is married, with a percentage of 79.39% of the total sample, compared to a percentage of 20.60% of the unmarried respondents. In addition, 79.39% of the professors are married. This indicates family stability in the community studied, which is a positive indicator of harmony and family balance, as it is of great importance in all aspects of social, cultural and educational life. Family stability serves as a fundamental driver of social behavior, as it provides social values that strengthen and support family cohesion and solidarity. It also influences individual behavior, motivation for achievement and creativity, and contributes to psychological and emotional well-being. These values also influence the professional and social aspects of an individual's life, enabling them to respond positively to different situations by exercising self-control, managing emotions and making wise decisions.

Therefore, it can be concluded that the presence of these values in the family environment of university professors, such as cooperation, awareness, support and a level of understanding regarding the difficulty of balancing academic and educational roles, as well as the psychological pressures resulting from the tension between these roles and their negative effects on the personal and professional levels of the professor, helps to contain and minimise the intensity of these effects by promoting stability and harmony within the family atmosphere.

"The overall family atmosphere and the emotional state of the professor have an impact on their academic performance and knowledge acquisition. A stable and healthy family environment allows for their academic growth and stimulates their motivation to achieve. Studies have also confirmed that the social environment in which an individual lives, characterized by family stability and support, plays an important role in guiding and directing their behavior by providing psychological balance, which has a direct impact on the professor's pedagogical and academic competences. Therefore, the social and family climate, together with the attention and support of the family, plays an effective role in the excellence and improvement of the university professor's competence, creating a suitable and encouraging environment based on positive and effective interaction.

Table (4)

Field of specialisation of university professors and their professional rank".

Specialization Academic Degree	Science and Technology		Humanities and Social Sciences		Total	
	Frequency	%	Frequency	%	Frequency	%
Full Professor	4	9.52	13	10.56	17	10.30
Associate Professor (A)	8	19.04	18	14.63	26	15.75
Associate Professor (B)	11	26.19	26	21.13	37	22.42
Assistant Professor (A)	12	28.57	35	28.45	47	28.48
Assistant Professor (B)	7	13.33	31	25.20	38	23.03
Total	42	25.45	123	74.54	165	100

The results recorded in the table on the distribution of the sample persons according to the specialization of the university professor and their professional rank show that the highest percentage, estimated at 28.48%, is related to the rank of assistant professor (rank A). This is distributed as follows 28.57% for technological and scientific specializations compared to 28.45% for social and humanistic specializations. The next percentage is 23.03%, which represents the rank of associate professor (rank B), distributed as follows 25.20% for Humanities and Social Sciences compared to 13.33% for Technological Sciences. This is followed by a percentage of 22.42% for the rank of Lecturer B and 15.75% for the rank of Assistant Professor (rank A). The lowest percentage, estimated at 10.30%, is for the rank of Professor of Higher Education.

What can be observed in this table is the influence of the academic degree of the professor in the form on the academic ranks. Looking at the academic degrees declared, it can be seen that professors with a doctorate and those with a master's degree occupy the position of lecturer B, while those with a master's degree occupy the position of assistant professor.

As for the A-level lecturers and professors, their rank is influenced by seniority, except in special cases where promotion may be based on the professors' scientific achievements and contributions to the enrichment of the field of knowledge through their scientific research and publications. This applies to four cases of research professors who reached the rank of Professor of Higher Education in less than 14 years.

While we find four cases of researchers who have exceeded their seniority by 27 or 30 years but are still in the rank of Assistant Professor (Rank A) due to health conditions that prevented them from registering for a PhD, they stated that they benefited from promotion due to seniority.

Alternatively, they may have conducted numerous field studies and are engaged in scientific research teams. They also have extensive connections with various community institutions to provide them with services or research. Therefore, they

perceive a PhD degree as formal compared to their actual work, which is why they did not pursue it.

Table (5)

Distribution of sample individuals according to seniority in education.

Seniority	Frequency	Percentage
Less than 5 years	11	6.66%
5 to 15 years	70	42.42%
16 years and above	84	50.50%
Total	165	100%

The table shows that the largest percentage, estimated at 50.90%, represents the professional seniority of professors with more than 16 years of professional seniority. This is followed by a percentage of 42.42% representing the seniority of professors with 6 to 15 years of professional experience. The remaining percentage, which is relatively small compared to the above percentages, is 6.17%, which represents the seniority of less than 6 years.

From the presentation of the results in the table, it can be concluded that the majority of practicing professors have a seniority of more than 15 years. This indicates a level of experience and knowledge acquisition that allows for effective interaction and good cognitive performance of students due to the expertise acquired.

Axis 2.3.4: First hypothesis

- The pedagogical and scientific task of the university professor is considered to be the basis for building the intellectual capital that is at the forefront of the knowledge society.

Table (6)

Indicates the extent to which researchers present realistic models of scientific research and discuss them with students.

Presenting case studies of problems and discussing them with students	Data	
	Frequency	Percentage
I do this whenever I have the opportunity	75	45.45
I do this sometimes	49	29.69
I do not do this	24	14.54
No answer	17	10.30
Total	165	100

The statistical analysis of the above table shows that there is a convergence in the responses of the researchers. Approximately 45.45% of them present real-life examples to students whenever circumstances allow and opportunities for analysis and discussion are provided. This makes it possible to understand the reasons and laws behind these examples. On the other hand, only 29.69% of the researchers rarely present real-life examples to students for discussion. Some 14.54% of them indicated that they do not engage in this practice at all, and 10.30% preferred not to answer this question.

Table (7)

Indicates the extent to which the professor relies on teaching activities.

Organizing field visits	Data	
	Frequency	Percentage
I always do this	35	21.21
Sometimes	12	7.27
I do not do this	118	71.51
Total	165	100

The statistical analysis of this table shows that 71.51% of the researchers do not rely on teaching activities as one of the essential strategies and modern teaching methods adopted in developed countries. The teaching profession has evolved beyond the transmission of knowledge to the acquisition of competencies and creative intellectual skills in students. This includes organizing visits to workplaces as part of their teaching responsibilities. Following this, a percentage of 21.21% of them replied that they always engage in teaching activities. On the other hand, 7.27% of researchers do so occasionally, depending on the circumstances.

Based on the results of the above table, it can be concluded that the pace of scientific and knowledge progress in Algeria remains slow and far from meeting the demands of the knowledge society and the objectives of higher education institutions to keep pace with the digital age and modern teaching strategies. These strategies go beyond traditional lecturing and rote learning and emphasize modern teaching activities. These activities have become the hallmark of contemporary higher education and include organizing field visits for students to observe practical examples, programming seminars and study days related to their courses and topics of interest, and staying abreast of the latest developments in their fields of specialization. In addition, discussions and the exchange of experiences and ideas foster a culture of openness to other people's perspectives and constructive criticism, which is used to increase motivation and healthy competition among students. Emphasizing teamwork in problem solving and presenting practical and applied models is also important, without neglecting the importance of attending conferences and scientific meetings to provide students with new skills and technologies and to benefit from the experience of other universities and countries in their fields of interest to deepen their knowledge and broaden their horizons beyond the university walls.

In teaching, it is time for students and professors to embrace the digital age and the knowledge society, and to adopt modern learning strategies that keep pace with the times. This should be accompanied by practical, intellectual and social benefits for students when they are assigned internships in different fields to familiarize themselves with phenomena, observe problems and interact with real-life examples, away from theoretical speculation. This experience helps students to develop communication, social, technical and scientific skills.

Field visits are considered one of the modern teaching methods used in advanced countries. They allow students to directly interact with and observe workplaces and conditions. As a result, it increases their motivation, encourages them to make efforts and develops their ability to discover facts, understand real-life problems and deal with them effectively by making appropriate decisions in a timely manner. Not carrying out field visits deprives students of the opportunity to develop independence,

initiative and a sense of adventure, which has a negative impact on their skills and knowledge.

Table (8)

Encouraging students to continue research and deepen their knowledge outside the university.

Encouraging students to enhance their academic achievement	Data	
	Frequency	Percentage
Always	98	59.39
Sometimes	43	26.06
Rarely	15	9.09
Never	9	5.45
Total	165	100

From the above table, we can see that the majority of researchers, with a percentage of 59.39%, encourage students to continue their intellectual pursuits and deepen their knowledge on their own, and not to rely solely on what they receive in lectures, due to the limited time available to cover all aspects of models and phenomena.

On the other hand, 26.06% of researchers occasionally encourage their students to continue research and learning outside the university in order to develop their cognitive and research skills. A percentage of 12.79% of the sample indicated that they rarely do so, while 8.88% indicated that they do not encourage students to engage in self-learning and further research that enhances their skills and abilities in comprehension, creative analysis and problem solving.

In order for professors and Algerian universities to achieve a knowledge-based society and ensure high quality outputs that contribute to development with competent and innovative students in their respective fields of specialization, it is necessary not to rely solely on the transmission of knowledge and on what the professor provides. This is not enough because of the rapid changes and enormous developments in various fields, which make it impossible for the professor to keep up with them all and pass them on to the students. The demands of the technological age and speed require the professor's ability to stimulate students' scientific curiosity and to foster an atmosphere of scientific competition through continuous work and self-research outside the university. This is achieved by assigning them fieldwork and research tasks, followed by discussion sessions to exchange opinions and ask questions to identify individual differences among students in terms of discipline, commitment, seriousness and level of interest in the subject. This ultimately improves the quality of the work presented.

Table (9)

Illustration of the researchers' efforts to increase student participation in the university.

Working to increase student participation in university life	Data	
	Frequency	Percentage
I do this continuously	35	53.84
Sometimes I do this	23	13.93
I do not do this	107	64.84
Total	165	100

The table above shows that 64.84% of researchers do not work on increasing student participation in university life. This is followed by a percentage of 53.84% who do so continuously, while 13.93% of researchers do so occasionally.

The involvement of students in university life, through participation in research laboratories or in organizing committees for scientific seminars and conferences, whether by contributing to the organization of study days and scientific seminars or by participating with interventions or scientific articles, increases their technical and practical experience and their interaction with the university environment. It allows them to keep abreast of the University's latest events, scientific and cultural activities, to broaden their interests and to participate in University life.

The results of the table show that a significant percentage, 64.84%, of researchers do not encourage their students to integrate into university life and take an interest in activities outside the lecture halls, such as scientific events, which would provide students with different skills, broaden their experience and deepen their knowledge. By involving them in practical activities, this is known as cooperative learning, which is a fundamental aspect of building a knowledge society and harnessing, directing and increasing the efficiency of bright minds to become the assets of the future and the vanguard of society.

Table (10)

Fostering a spirit of fair competition among students.

Fostering a spirit of fair competition among students	Data	
	Frequency	Percentage
I always strive to do that	88	53.33
I do it sometimes	28	16.96
I do not work on that	49	26.69
Total	165	100

Looking at the statistics in the table above, it can be seen that the highest percentage of researchers, estimated at 53.33%, always make an effort to promote a spirit of fair competition among students. On the other hand, there is a convergence in the percentages of researchers who do so occasionally and those who do not make such efforts at all, with percentages of 29.69% and 16.96% respectively.

In order to create a spirit of fair competition among students, motivate them to work together and increase their motivation, professors assign students to research teams and supervised projects. This creates a competitive atmosphere and allows students to express their opinions on the work of their peers, encouraging constructive criticism and the exchange of ideas among students and the selection of the best among them. The results are then presented at study days and academic conferences.

However, the percentage of professors who have indicated that they do not engage in such practices remains significant. This may have an impact on the level and quality of students' cognitive and technical achievements, as they rely solely on traditional teaching methods that do not allow for the transition to a knowledge society in the digital age.

Table (11)

Evidence of the suitability of the content of current educational programmes for the knowledge society era.

Alignment of educational programs with the knowledge society era	Data	
	Frequency	Percentage
Completely suitable	16	9.69
Suitable to some extent	26	15.75
Not suitable at all	115	69.69
No response	8	4.84
Total	165	100

From the results of the table above, it is clear that a percentage of 69.69% stated that the current educational programs are not suitable for achieving a knowledge society. This is followed by a percentage of 15.75% who consider them to be somewhat suitable, and a percentage of 9.69% of researchers who acknowledge that they are not at all suitable. Meanwhile, a percentage of 4.84% refrained from expressing an opinion.

Modern educational policies and programs aim to provide knowledge and ensure academic achievement that enables students to rely on creativity, constructive logical thinking, analysis, problem solving, interpretation of phenomena and finding solutions. This should be accompanied by continuous renewal and updating of knowledge and information, keeping abreast of scientific advances and keeping up with changing times and developments.

Comparing and analyzing the results of the above table, we can conclude that the majority of researchers, estimated at 69.69%, acknowledge the inadequacy of educational programs to meet the needs of a knowledge society and to keep up with changes in the scientific field. In this regard, it is the responsibility of the academic professor to research and study topics related to the curriculum and to update the acquired knowledge according to the ongoing transformations. Professors can participate in special committees, propose educational contents that serve the educational mission, discuss them with colleagues, exchange opinions and benefit from their experiences. They can work on proposing and developing standardised scientific material and agreeing on an educational model and high-quality content that will serve the quality of higher education and achieve leading results in various fields.

Table (12)

Use of modern teaching methods.

Alignment of teaching methods with educational curricula	Data	
	Frequency	Percentage
I always use modern teaching methods	23	13.93
Sometimes I employ modern methods in teaching	46	27.87
1do not follow modern teaching methods	96	58.18
Total	165	100

From the data in the table above, it can be seen that 58.18% of the researchers do not use modern teaching methods appropriate to the nature of the educational curricula. On the other hand, 27.87% of the sample occasionally use modern teaching methods, while 13.93% of the sample admitted their continuous commitment to keeping up to date with teaching methods and their dedication to applying and using them in their lectures.

The current era is characterized by rapid technological and scientific advances in a knowledge-based society, where innovative ideas and competent minds have become an economic force that ensures a competitive advantage for employees in various institutions. Therefore, higher education institutions and university professors, as the cornerstone and backbone of these institutions, have a responsibility to achieve their educational and research goals and to serve the community. This can be achieved by providing scientific research to solve their problems and by providing excellent frameworks with high skills and efficiency. It has become essential for them to keep abreast of developments in teaching methods and scientific research in order to integrate into the digital age, to meet the demands of the knowledge economy and to provide the necessary resources.

The results of the table confirm that the majority of professors rely on traditional teaching methods to impart knowledge and present lessons, often through lectures that lack discussion or opportunities to exchange opinions and ideas, thereby limiting classroom interaction. This hinders their ability to influence and be influenced, as well as the potential for students to express themselves and demonstrate their abilities through discussion and the exchange of ideas.

Table (13)

Illustration of researchers' organisation of educational content for students.

Organizing the content of the educational material	Data	
	Frequency	Percentage
Always	66	40
Sometimes	46	27.87
Rarely	32	19.39
Never	21	12.72
Total	165	100

According to the table above, the highest percentage of researchers. 40% always organize educational content for students. On the other hand, 27.87% of them do it occasionally and 19.39% rarely. On the other hand, 12.72% of the researchers never organize the educational content for the students, whether it is related to organizing the content of the lesson or linking new information to previous knowledge.

Modern teaching methods rely primarily on the pedagogical skills and abilities of university teachers. The academic performance and quality of students depends on the professor's method of teaching, interaction in lectures, ability to capture students' attention, arouse their curiosity and engage them in the subject matter. The professor's effectiveness is measured by his or her ability to engage students, encourage them to ask questions, seek clarification, engage in discussion, and present their ideas and perspectives. This ensures that the benefits and insights of students' experiences and ideas are shared and utilised in the discussion.

An excellent professor should use and apply various pedagogical methods to impart knowledge and ensure the quality of students' academic performance. This leads to the establishment of a knowledge society with high scientific and technical standards. However, if a significant percentage of professors do not priorities the updating of scientific content and knowledge, rely on traditional teaching methods and stick to outdated course materials, and rely on outdated knowledge and sources that do not keep up with ongoing changes, it hinders the educational and research mission of the university. It makes the achievement of a knowledge society elusive if it continues to maintain traditional teaching methods and neglects to keep up with the content of the programs offered.

3. 3.4 The second axis: Hypothesis 2:

The lack of technical qualification of university professors hinders the research and teaching process.

Table (14)

Shows the extent of changes in curricula and teaching methods during the career of researchers.

Changes in curricula and teaching methods	Data	
	Frequency	Percentage
Continuously changed	79	47.87
Partially changed	53	37.12
No change	33	20
Total	165	100

From a statistical reading of the table above, we can see that there is some convergence in the responses of the researchers. About 47.87% of them confirm that the curriculum and teaching methods are constantly changing. On the other hand, 32.12% perceive partial changes, while 20% state that they have not changed since they started working.

Table (15)

Illustrates the degree of adaptation between the initial specialization of the researchers and the requirements of the educational process.

Alignment of the professor's original specialization with the requirements of the educational process	Data	
	Frequency	Percentage
Yes	109	60.06
Sometimes	38	23.03
No	18	10.50
Total	165	100

The results in the table above show that 66.06% of the respondents confirm that their initial specialization is in line with the requirements of the educational process. Conversely, 23.03% of the respondents indicated occasional alignment, while 10.90% stated that their original specialization was not aligned with what they were studying.

This can be attributed to the University's commitment to the principle of "putting the right person in the right job" and its efforts to achieve its teaching objectives in terms of improving students' academic performance. Aligning professors' specializations with the subjects they teach increases their teaching efficiency and improves the quality of the educational process according to its real needs.

Table (16)

illustrates the changes in the school's standards from year to year.

Changing the school standards from year to year	Data	
	Frequency	Percentage
Yes	34	20.60
Sometimes	95	57.57
No	36	21.81
Total	165	100

The table above shows that 57.57% of respondents occasionally change the standards they teach from year to year. In contrast, 21.81% do not try to change the material taught and prefer to keep the same standards. In addition, 20.60% of respondents indicated that they do not change the standards taught each year.

Effective knowledge transfer and achievement of educational objectives depend fundamentally on the ability and expertise of university teachers to keep abreast of and informed about new developments in their field and the standards they teach. It also depends on their knowledge acquisition, broad understanding and use of diverse information and knowledge from different fields and levels. The more professors embrace change and variation in the standards taught at different levels and years, the more it enriches their intellectual and scholarly repertoire. As a result, it has a positive impact on students' academic performance and ensures that the university fulfils its function of serving the community by equipping it with the necessary skills and competencies for its progress and development.

Analyzing the data in the table, we find that a significant proportion of respondents indicated that they do not change the standards taught. The continuous repetition of the same standards in teaching leads to cognitive stagnation and the reluctance of the professor to make efforts in research, innovation and updating their knowledge. This has a negative impact on their morale and motivation to work, which in turn hinders the university in achieving and building a knowledge society and affects the quality of its outputs.

Table (17)

Use of modern teaching techniques by researchers.

Utilizing modern technologies in teaching	Data	
	Frequency	Percentage
I always use them continuously	31	18.78
Sometimes I do so	55	33.33
I stick to traditional methods	79	47.87
Total	165	100

Statistical analysis of the above table shows that the highest percentage of respondents, 47.87%, do not use modern teaching techniques. On the other hand, 33.33% do so occasionally, while 18.78% of the respondents prefer to stick to traditional teaching methods.

When analyzing the data in the table, the highest proportion of respondents, 47.87%, indicated that they do not use modern techniques such as various educational media, such as information and communication technologies (ICT), computer equipment, the Internet, data projectors and PowerPoint software, in delivering lessons and imparting knowledge. This can be attributed to the lack of multimedia classrooms and Internet availability in Algerian universities, as well as the limited or non-existent use of projection and mobile devices.

Table (18)

Illustrates the participation of researchers in scientific conferences related to digital technology.

Gender / Age	Always		Sometimes		Do not attend		Total	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Professor (Higher Education)	4	4.76	8	22.85	5	10.86	17	10.3
Lecturer (A)	9	22.61	5	14.28	2	4.34	26	15.75
Lecturer (B)	25	29.76	8	22.85	4	8.69	37	22.42
Assistant Professor (A)	29	34.52	10	28.57	8	17.39	47	28.48
Assistant Professor (B)	7	8.33	4	11.42	27	58.96	38	23
Total	84	50.50	35	21.21	46	27.87	165	100

Reading the statistical data in the table above, it is clear that the highest percentage of researchers, 50.90%, reported regular participation in conferences and events related to digital technology in higher education. This participation is distributed among the different academic ranks as follows 34.52% for Assistant Professors (category A), followed by 29.76% for Lecturers (category B), 8.33% for Assistant Professors (category B) and finally the lowest percentage of 4.74% recorded for Higher Education Professors. On the other hand, 27.87% of researchers do not attend conferences, while 21.21% of the sample occasionally attend scientific conferences related to digital technology.

When analyzing the data in the table, we can see a convergence in the percentages of participation in conferences by permanent professors in the ranks of assistant professors (category A), lecturers (category B) and assistant professors (category B). This convergence can be explained by the need for professors to obtain certificates of participation for their academic promotion dossiers. This also explains the decrease in participation among university professors and assistant professors (category B), due to their reduced need for participation.

The effective transmission of knowledge in the digital age depends fundamentally on the experience and competence of university teachers, as well as on their intellectual achievements.

It requires them to keep abreast of advances in information and communication technology. Digital technology, with its interactive and communicative links, offers new opportunities for generating, sharing and disseminating knowledge through a wide range of media, software and communication tools. These tools play a crucial

role in stimulating learners' senses and developing their creative thinking, making education more profound and lasting in their minds. Teachers should therefore embrace the digital environment and take advantage of the opportunities it offers, as it is the basis for success and keeping up with developments. Despite the knowledge opportunities offered by digital technology, academic promotion remains the primary goal for university professors' participation in scientific events.

Table (19)

Illustrates the difficulties in using digital education.

Gender of researchers	Facing challenges in teaching using digital technology							
	Yes		Sometimes		No		Total	
	F		F	%	F	%	F	%
Male	39	55.71	28	43.07	16	55.33	83	50.3
Female	31	44.28	37	56.92	14	46.66	82	46.69
Total	70	42.42	65	39.39	30	18.18	165	100

From the table we can see that the majority of the sample, representing 42.42%, have difficulties in delivering information through digital education. In addition, 39.39% of the researchers occasionally face challenges in delivering information through digital technology. However, 18.18% of the total sample reported no difficulties in using digital technology in teaching.

The weak ability to deliver knowledge using digital technology and ICT can be attributed to a lack of training, resources and necessary facilities, such as classrooms equipped with digital educational media and internet access. Some researchers believe that the use and implementation of digital technology is a pedagogical burden on university teachers. Some even argue that it is not academically effective or persuasive, given the lack of ongoing training and inadequate equipment. In addition, digital systems technology can be financially costly. Some argue that the use of digital technology complicates rather than facilitates the educational process due to the lack of skills and continuous training to keep up with advances in the field.

Despite the potential of digital technology to generate and disseminate knowledge, and the benefits it offers in terms of time efficiency and easy access to information, there is a lack of continuous training to keep up to date in this area.

This is in addition to the financial cost of digital technology systems. However, there are ways to benefit from digital technology, such as using Internet services to transmit images for direct educational purposes. Digital audio devices are also seen as important tools for improving students' listening skills. Digital media help teachers to carry out their teaching and research tasks in a short period of time, and also offer the possibility of using digital library websites to access research and references, thereby increasing the academic and scientific knowledge of university professors.

To meet these challenges, it is necessary to improve the qualifications of professors to meet the requirements of digital education. This can be achieved by intensifying training courses on electronic programs, improving the English language skills of students and professors, and providing digital equipment to higher education institutions to fulfil their required role.

Table (20)

Shows researchers' opinions on the benefits of digital technology.

Changes in curricula and teaching methods	Data	
	Frequency	Percentage
Benefits of using digital technology:		
Stimulates student motivation and increases classroom interaction.	156	22.64
Provides teachers with more knowledge and easier access to it.	88	12.77
Increases communication between students and with professors.	152	22.06
Facilitates understanding and comprehension.	55	7.98
Provides lessons throughout the day.	163	23.65
Eliminates the need for physical presence.	75	10.88
Total	689	100

The sample size represents the diversity of responses.

Reading the results in the table above, it is clear that the majority of professors and academics, representing 23.65%, confirm the advantages of digital technology, particularly in terms of availability and time savings in accessing teaching and knowledge. This is also the opinion of 22.64% of researchers. They are followed by 22.06% who believe that new information and communication technologies offer opportunities for communication between students and professors. As for the group of professors who expressed the importance of improving and guaranteeing digital media for the quality of higher education and the motivation of students, their percentage reached 12.77%. They were followed by 10.88% who considered that one of the advantages was the absence of compulsory attendance. Finally, 7.98% of the sample stated that digital technology facilitates understanding and comprehension.

Based on the analysis of the table results, we can conclude that the majority of researchers, with a percentage of 23.65%, emphasize the possibility offered by digital technology to access curriculum materials throughout the day and every day of the week. This helps students with different responsibilities and commitments to learn at a time that suits their circumstances.

We observe that 22.64% of the total sample believe that the use of digital technology provides professors with more knowledge, information and modern teaching methods. Meanwhile, 22.06% of professors see digital technology as a means of facilitating communication and interaction between students, professors and the educational institution. It makes it possible to address university issues and participate in their analysis and resolution. In addition, 12.72% of the sample members believe that the use of digital media in teaching allows for the development of students' intellectual and cognitive skills. This ensures the effectiveness and success of the educational process and improves their ability to reason, analysis, synthesize and deduce. Digital methods in education motivate students and increase their engagement in the classroom, as well as promoting positive thinking by accessing new information and

updating their knowledge through the Internet. This ensures that higher education institutions fulfil their educational and research functions, thus guaranteeing the quality of higher education.

In addition, the remaining researchers emphasize the importance of digital technology in providing opportunities for non-compulsory physical attendance, thus making education more attractive. Examples include online examinations and instant feedback. From this it can be concluded that there is a need for professors to be involved in the digital environment and to use different media and technologies in teaching, while ensuring that they do not impose additional burdens on the teaching and research process of university professors.

Table (21)

Illustrates the main barriers to the use of digital technologies in higher education.

Barriers to the use of digital technology:	Data	
	Frequency	Percentage
Lack of clarity about the nature and effectiveness of technology in education.	35	7.05
Increased additional burdens.	120	24.19
Negative teacher attitudes and resistance to change.	45	09.07
Lack of digital literacy and training.	135	27.21
Lack of resources and facilities.	161	3245
Total	496	100

The table above shows that 32.45% of respondents consider the lack of equipment and resources to be one of the main barriers to the effective use of digital technology in education. This is followed by 27.21% who believe that the lack of continuous training prevents university teachers from using digital technology in education. In addition, 24.19% of the sample consider the use of digital media to be an additional burden on the pedagogical and research tasks of university teachers. Another important obstacle cited by 9.07% of respondents was the resistance to change and negative attitudes of professors, which hinder the successful implementation and effectiveness of digital technology in education. Finally, 7.05% of the sample claim that the use of digital technology in education is not feasible.

Looking at the data in the table and the reality of the educational environment in our universities, we can see several obstacles that hinder the effectiveness of distance learning, the facilitation of the digital transition and the successful implementation of e-learning in the organizational and academic context. These obstacles are related to the lack of advanced equipment, technological infrastructure and communication networks, as well as inadequate Internet access and various network services. There is also a lack of maintenance, regular monitoring, program adaptation and updating. Most students and even professors do not have the opportunity to own quality laptops, smart phones or the technological tools necessary for distance learning. Even average or weak internet connectivity is not available to everyone. This situation is due to generally weak economic growth, which has led to a decrease in purchasing power and individual income, making it difficult to afford these tools due to their high prices. In addition, the lack of access to advanced technologies such as those found in

developed countries is also a contributing factor, as indicated by 32.45% of all respondents.

According to 27.2% of the sample, one of the obstacles hindering the success and effectiveness of e-learning and digital education in our university are mainly related to the lack of training and qualification in information and communication technologies, as well as the use of various electronic applications in the educational process. Most faculty members need specialized training in communication technologies, developing their skills in creating electronic educational materials and using various digital devices and applications in the field of education. They also need knowledge of distance education pedagogy, especially with regard to assessment and evaluation methods, conducting examinations, recording attendance and interacting with students at a distance. It is not possible to apply the same standards and pedagogies of traditional education to distance learning.

In addition, 24.1% of respondents stated that the use of digital technology in education is an additional burden on the pedagogical process and they do not see its benefits. In addition, 9.07% of the professors acknowledged that the main obstacles to the implementation and ineffectiveness of digital technology in higher education institutions in Algeria was related to negative perceptions towards digital transformations and dealing with modern technologies. Some prefer traditional teaching methods and resist integration into the new path, which involves professors, students and administrators. There is also the misuse of technology for negative purposes, such as cheating, academic theft and impersonation, whether in exams or scientific research. There is also a lack of culture in the maintenance of public facilities, which leads to their deterioration.

Table (22)

Illustrates the extent to which the organizational environment is conducive to the work and creativity of professors.

Encouraging organizational environment for creativity	Data	
	Frequency	Percentage
Very encouraging	15	09.09
what encouraging	39	23.63
Not at all encouraging	111	67.27
Total	165	100

The statistical analysis of this table shows that 67.27% of respondents say that the organisational environment does not encourage creativity, innovation and a sense of responsibility at all. On the other hand, 23.63% of them think that it somewhat encourages work and creativity. Meanwhile, 9.09% of the respondents affirm that the internal environment and working conditions fully support work, responsibility and creativity.

The analysis of the data shows that a significant percentage of professors and participants (67.27%) confirm the lack of motivation of the organizational environment of the university to promote responsibility, creativity and the dissemination, acquisition and production of knowledge. This is attributed to the lack of readily available databases on research carried out at the university and the lack of

focus on updating the knowledge base and competencies of students, staff and especially professors.

Table (23)

Level of interest of the organizational environment in enhancing students' creative skills.

Encouraging creativity and research skills	Data	
	Frequency	Percentage
Always	16	09.69
Sometimes	56	33.93
Never	87	52.72
Don't know	6	3.63
Total	165	100

The statistical analysis of the above table shows that the highest percentage of respondents (52.72%) stated that the university does not priorities the development of students' creative skills. This is followed by 33.93% who believe that the university occasionally focuses on updating its programs and enhancing students' creative spirit. In addition, 9.69% responded that the university always priorities this aspect. However, 3.63% of the sample did not give an opinion.

From the analysis of the data in the table, we can conclude that the university does not pay significant attention to knowledge production, which is considered one of the fundamental pillars in the knowledge cycle and the transition to a knowledge society. This is evident in the lack of encouragement from the university's organizational environment to attract qualified students and retain creative talent. There is also a lack of incentive policies for innovation, research excellence or knowledge production. In addition, there is a lack of interest and planning to effectively use and benefit from graduate students, and a lack of modern and advanced programs. Officials still view university students as projects that have not yet reached their investment potential, which is reflected in their focus on academic roles without effectively integrating these students into real-world work experiences.

4.4 Discussion of the findings:

Through this study, we have attempted to explore the role of the university in achieving a knowledge society. Based on theoretical analysis and the presentation of field study data, we have concluded that the pace of scientific and knowledge advancement in Algeria remains slow and far from meeting the demands of a knowledge society and the goals of higher education institutions to keep up with the digital age and modern teaching strategies.

Modern university education goes beyond traditional lecture-based teaching and rote learning and instead emphasizes contemporary educational activities. These include organizing field visits for students to gain practical exposure to models, programming seminars and study days related to their courses and subjects of interest to keep abreast of new developments in their respective fields. In addition, holding discussion sessions to exchange experiences, perspectives and ideas fosters a culture of accepting and benefiting from others' thoughts and constructive criticism to stimulate

motivation, healthy competition among students, and collaborative work to solve problems and present practical and applied models.

However, it is important not to neglect the importance of attending conferences and scientific symposia, which provide students with new skills and techniques and the opportunity to learn from the experience of universities and other countries in their areas of interest. This helps to deepen their knowledge, broaden their horizons and expand their areas of interest beyond the confines of the university and academic departments.

Now is the time to integrate into the digital age and the knowledge society, to be open to the world and to adopt modern learning strategies that keep pace with the times. It is crucial to recognize the practical, intellectual and social benefits that students gain when they are assigned work placements in different fields, allowing them to understand phenomena, observe problems and interact with real-life models. This practical experience, detached from theoretical environments, equips students with communication, interpersonal, technical and scientific skills.

-In order for university professors and Algerian universities to achieve a knowledge society and ensure highly competent results that contribute to development, it is essential not to rely solely on the transmission of knowledge and what the professor provides. This is not enough, given the rapid changes and enormous advances in various fields, which make it impossible for the professor to keep up with them all and pass them on to his students. The demands of the technological age and the need for speed require the ability to stimulate students' scientific curiosity and foster an atmosphere of academic competition. This can be achieved by motivating students to continue their work and to engage in self-directed research outside the university, as well as to keep abreast of new developments. This is a common practice of the majority of research-oriented professors.

-Involving students in university life through participation in research laboratories and in organizing committees for scientific seminars and conferences, whether by contributing to the organization of study days and scientific conferences or by presenting papers or scientific articles, enhances their technical and practical experience. It provides opportunities for interaction within the university environment and exposes them to all the new events organized by the university in terms of scientific and cultural activities. This increases their interest and involvement in university life.

From the results presented in the table, it is clear that a significant proportion, 64.84% of the researchers surveyed, do not encourage their students to integrate into university life or to take an interest in activities outside the lecture halls, such as scientific events, which could equip students with different skills and improve their academic performance.

-The majority of researchers, 69.69%, acknowledged that the educational programs are not suitable to meet the requirements of a knowledge society and to keep up with the changes in the scientific field. In this regard, it is the responsibility of university professors to seek out new developments in their specialization and in the topics covered in the curriculum. They should work on updating the acquired knowledge in line with the ongoing changes. Professors can participate in specialized committees and propose educational content that serves the educational mission. They can discuss these proposals with their colleagues, exchange opinions and benefit from their experience. Together, they can propose and prepare unified academic material and

agree on a teaching model and high-quality content that will improve the quality of higher education.

-The reliance of the majority of professors on traditional teaching methods, which focus on imparting knowledge and delivering lectures without engaging in discussion or opening the door for the exchange of opinions and ideas, limits classroom interaction. This prevents them from having the opportunity to influence and be influenced by their students, and to benefit from each other. Opening the space for discussion and constructive criticism allows for the development of skills, expression and the discovery of potential and weaknesses through the presentation and exchange of ideas.

-A significant percentage of professors do not priorities updating scientific material and researching new developments in their field. They rely on traditional teaching methods and classical course content, and on outdated knowledge and sources that do not keep pace with current developments. This hinders the education and research mission of the university and makes it difficult to achieve a knowledge society if traditional teaching methods are maintained. In addition, they do not use modern technology and various educational media such as computer equipment, the Internet, data projectors and PowerPoint software to deliver lessons and impart knowledge. This is due to the lack of multimedia classrooms and internet access in Algerian universities, as well as the limited availability or absence of presentation and mobile devices. Despite the knowledge opportunities offered by digital technology, upgrading remains the primary objective for university professors' participation in scientific events.

-It is argued that digital technology is financially costly and some believe that its use complicates rather than facilitates the educational process. This is due to a lack of skills and continuous training to keep up with the latest developments in the field. This is despite the opportunities for knowledge generation and dissemination and the benefits it offers.

-There are several obstacles that hinder the effectiveness of distance learning and the facilitation of the digital transition, as well as the successful implementation of e-learning in the organizational and academic environment. These obstacles are related to the lack of advanced equipment, technological infrastructure and communication systems. There is a lack of reliable Internet access and various network connections. There is also a lack of maintenance, regular monitoring, program reconfiguration and updates.

-The majority of students and even professors do not have access to quality laptops, smartphones or other technological tools necessary for distance learning. In addition, average or poor internet connectivity is not available to all. This is due to the overall weakness of the economy, which has led to low purchasing power and individual incomes, making it difficult to afford these devices due to their high prices. The lack of advanced technologies, such as those found in developed countries, is also a contributing factor. This view was expressed by 32.45% of respondents.

There is also a lack of training and skills in information and communication technologies. There are negative attitudes towards digital transformation and resistance to the adoption of modern technologies, with some preferring traditional teaching methods and refusing to integrate into the new digital path. This resistance can be found among professors, students and administrators alike, as change is not always readily accepted.

-The organizational environment is not conducive to the dissemination, acquisition and production of knowledge. This is evident in the lack of readily available databases of research undertaken within the university. The institution does not actively seek to attract and retain highly competent and talented individuals, and there is a lack of incentives for research excellence or knowledge production.

5. Conclusion:

Higher education institutions face challenges and stakes in the transition to the digital age. Pedagogical and educational methods are evolving in line with this digital revolution. Education is no longer limited to the exchange of information, but has become a digital platform for learning, interaction between professors and students, and communication with the administration regarding all pedagogical and research activities. Therefore, it has become imperative for universities and academic professors, as the focal point of the educational process, to integrate into the digital technology era, using e-learning systems and adapting their methodologies to the requirements of digital technology. This is a challenge for universities to achieve intellectual and knowledge capital that is pioneering and distinguished, considered to be at the forefront of the knowledge society.

However, universities in Algeria face a digital divide and a lack of technological resources compared to developed countries. Evaluation methods do not allow the discovery of talents and qualified people. The functions of universities have been limited to the temporary absorption of jobs, without contributing to the development of society, and their contribution to the construction of the knowledge society remains weak. This is due to the lack of essential components such as communication technology and information infrastructure, the stagnation of scientific research funding and development, the deterioration of the quality of education and the mismatch between university outputs and the labor market. University functions have been dominated by the management of professors' careers rather than the development of competences. The university continues to face numerous problems at all levels, which contribute to weak cognitive performance at all stages of the knowledge cycle, including production, dissemination and use.

In order to enable higher education institutions to fulfil their educational and research mission and to provide society with the necessary skills, the researcher proposes the following set of recommendations:

1. It is essential to develop new strategies and objectives, adapted to the requirements of digital technology, in order to meet the challenge and achieve a balance between what can be taught at a distance and what must be maintained through physical presence. The oscillation between virtual and face-to-face modes remains the greatest challenge for higher education institutions. It is also important to understand the difficulties and obstacles they face in fulfilling their role and mission, and to develop effective strategies, plans and programs for digital transformation.

2. It is imperative to have advanced technological tools and techniques while providing modern curricula and teaching methods that allow for the improvement of higher education outcomes. It is essential to invest effectively in existing human resources, develop their knowledge acquisition skills, and thereby empower them to produce, innovate and use their knowledge for the development of society. The road to a prosperous society and economy inevitably passes through the gateway of education, with a focus on intellectual capital development, cognitive awareness and

empowerment. This includes stimulating the production, generation, use and dissemination of knowledge to maximize the investment potential of its outcomes.

3. Attention should be paid to the organizational environment of the university by providing educational resources, training faculty members, promoting scientific research and raising the level of students. The building of a knowledge society should be a priority in government programs, with a focus on meeting its needs.

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