Testing Availability of Human and Technical Requirements for Knowledge Management Implementation in Moroccan Universities

Yassine Boussenna and Ouail El Kharraz

ABSTRACT

Effectively handling knowledge is crucial for any organization to survive and prosper in the turbulent environments of the modern era. However, Effective knowledge management implementation requires the presence of organizational, Human, and Technological appropriate infrastructure. throughout, the literature Most authors cite (Management leadership and Information Technology).

The main objective of this study was to verify the presence of success factors for (KM) implementation at the Moroccan universities via the Abdelmalek Essaadi University subject of this work.

Through deductive reasoning approach and a quantitative working method, Using the questionnaire as a tool to collect data from a proportional random and representative sample of 88 teacher-researchers from the different institutions of the university under study.

This paper presents empirical evidence of the positive relationship between (Management leadership, IT) and (KM) implementation at Moroccan universities with a Pearson correlation rate of $R = 0.635$ For Management leadership and 0.554 for Information Technology.

Also, the results obtained show insufficiency presence of initiatives for (KM) application, with an average of 2.14 for leadership and 2.29 concerning (IT) according to the university's teachers.

Keywords: leadership; Information Technology; knowledge management.

Submitted : July 17, 2021

Published : August 09, 2021

ISSN: 2507-1076

DOI: 10.24018/ejbmr.2021.6.4.984

Yassine Boussenna

Research Group: Management & Information Systems, National School of Business and Management Tangier, Abdelmalek Essaadi University, Morocco.

(e-mail: y.boussenna@gmail.com)

Ouail El Kharraz

Research Group: Management & Information Systems, National School of Business and Management Tangier, Abdelmalek Essaadi University, Morocco.

(e-mail: Kharraz2006@gmail.com)

**Corresponding Author*

I. INTRODUCTION

In this changed competitive technology and the market scenario, Modern institutions, including institutions of higher education, face Large and unprecedented challenges due to the changes resulting from the information and technological revolution, in addition to the fierce competition between different institutions and the challenges that have emerged in the various sectors, especially the educational ones, so it was necessary to face this competition and challenges to keep pace The wheel of change and facing the competition imposed by the advanced reality based on science and knowledge.

Knowledge management developed mostly in knowledge-intensive organizations because of the dominance of intangible resources and knowledge capabilities. Universities are such knowledge-intensive organizations, and that is a crucial argument as to why knowledge management impacts the whole academic management and leadership as well as the students' education. Although universities are based on teaching and learning processes, they are not, by definition, learning organizations. They must develop powerful

knowledge management systems and design knowledge strategies for becoming learning organizations characterized by generative learning processes [1], [2].

On the other hand, and throughout the literature, several factors positively affecting KM initiatives in public organizations and specifically in universities are discussed. For Ranjan & Bhatnagar [3] these are factors or parameters necessary for the continued success of an organization and these factors represent the areas of management that require special and continuous attention to achieve high performance. Some are the same as those identified for private organizations and others are specific to public organizations. Most authors Butler & Murphy [4], Cong [5], Ansari *et al.* [6] cite several factors; but in this article, we will focus on Management leadership and information technology.

Several studies have shown the importance of Management leadership to support the implementation of the KM process [7]-[12].

In addition, Leadership plays an important role in managing knowledge within organizations. Insufficient or ineffective support from top managers can lead to the failure of knowledge management projects Traditionally, leadership

research has not specifically considered leadership as an enabler of knowledge management. However, recent research has emphasized the importance of leaders in managing knowledge.

In parallel effective knowledge management (KM) requires the appropriate use of organizational strategies as well as information technology (IT). Our definition of IT includes computers and communications technologies, IT is likely to play a crucial role in implementing most KM initiatives.

Also, several researchers have insisted on the importance of information technology (IT) to support the creation, storage, retrieval, transfer, and application of knowledge in organizations by data mining and learning tools, knowledge repositories, databases, electronic bulletin boards, discussion forums, intranets, email, calendaring tools, collaboration tools, including text-based and audio chat tools, telecommunication and video-conferencing [13]-[18].

The purpose of the present research is to analyze the existence of success factors for knowledge management implementation and more specifically the Management leadership and information technology at the Moroccan universities through the Abdelmalek Essaadi University subject of this work.

The research question we try to answer is the following: Are the Moroccan universities ready for the application of the KM?

The research question RQ will be decomposed into three subsidiary research questions as follows:

- RQ1: there is a relationship between the Management leadership and information technology of Moroccan universities and their level of application of KM?
- RQ2: the current Management leadership of Moroccan universities allows the application of KM?
- RQ3: the current information technology infrastructure of Moroccan universities allows the application of KM?

Thus, our reflection will focus on the treatment and analysis of the following three elements: (1) Literature review and development of hypotheses (2) Research methodology, and (3) discussion of the results of the study.

II. THEORETICAL BACKGROUND AND HYPOTHESES

A. KM at University

Universities are knowledge-intensive organizations because all the basic processes employ data, information, and knowledge. Teaching is essentially a transfer of knowledge from professors to students, but it involves many activities and tasks of data, information, and knowledge collection, selection, structuring, and integration into ideas and theories, which correspond to a certain conceptual framework. Teaching can be performed directly in classrooms or online by using specialized platforms and indirectly through a series of printed materials or stored documents in databases. Teaching also involves knowledge sharing that reflects professors' experience [19].

According to El kharraz *et al.* [20] knowledge management for universities composed of a set of practices and approaches aimed to identify, create, use, capitalize, share and transfer knowledge within universities to improve the quality of the

final product (Student Skills or New Knowledge)".

B. The K.M Process in Universities

Knowledge assets are managed in several ways, namely: through capitalization, sharing, and knowledge creation.

There is no unified agreement among authors and researchers regarding the number of K.M processes, as different researchers define them in different ways Costa & Monterio, [21] and with several models as they are defined as three stages: knowledge generation, knowledge codification, and knowledge transfer. Or four consisting of Acquiring, storing, sharing, and applying knowledge or it is a five-step process consisting of (knowledge acquisition, knowledge formation, knowledge transfer, knowledge storage, and application) [22].

Becerra *et al.* [23]. integrated the empirical research findings of Nonaka [24] (socialization, externalization, internalization, combination), and distinguished four knowledge management processes: knowledge discovery, knowledge capture, knowledge sharing, and knowledge application.

On our part in this work, we will opt for the most used model and the most adapted to the universities in four stages consisting of acquiring, storing, sharing, and using knowledge [25], [26].

C. Historical Overview of the Evolution of Leadership

According to Pelletier [27] classical theories of leadership fall into three categories. First, some research focused on leader characteristics such as gender, size, and intelligence [28]-[31]. However, this research was not very successful. Then, research turned to the behavior of the leader. McGregor [32] developed the X and Y theories. Likert [33] developed a continuum of four leadership styles, while Blake and Mouton [34] developed a grid of five main styles: autocratic, paternalistic, democratic, collegial. Finally, Hersey and Blanchard [35], Vroom and Yetton [36] as well as House [37] show that the elements of a situation often influence the choice of the leader and his style [38].

D. What Leadership Style is Appropriate for Universities?

Because his mission is to guide students on the path to knowledge, and because his daily actions lead him to make decisions, the university professor can be seen as a leader. It, therefore, becomes interesting to develop a vision of his teaching style.

Transformational leadership is not the only leadership style relevant to university administrators working in professional learning communities.

Bouker [39] mentions four leadership styles appropriate for the field of education: transactional, transformational, ethical, and pedagogical leadership. However, for this researcher, while transformational leadership aims to transform people, inspire them to excel, and move them toward a common goal, pedagogical leadership would be more relevant to university principals working in professional learning communities, as it would focus more on improving teaching and learning, which is the primary mission of professional learning communities.

Dimmock [40] does not deny the relevance of instructional leadership but emphasizes the possibility of conjunction with transformational leadership within professional learning

communities. For him, the professional learning community as an organizational structure and dynamic of the academic institution depends first and foremost on the support of academic leadership, which was found in both of these leadership styles. Consequently, principals should combine transformational leadership and instructional leadership within professional learning communities to support teachers in improving their practice and the educational success of students.

Finally, for their part, Huffman *et al.* [41] recognize five leadership styles appropriate for professional learning communities: constructivist, strategic, transformational, pedagogical, and distributed. Concerning transformational leadership, the authors assert that it allows university administrators to involve female teachers in decision-making and their professional development.

E. Knowledge Management and Leadership

The role of leadership in knowledge management [42], [43] and innovation processes [44]-[46] is crucial. Several authors agree with this statement. That said, the Leadership dimension attempts to understand this relationship in this research.

We can first ask whether there are innovations without leadership. there is no innovation without leadership. According to Szezerbicki *et al.* [47], the existence of leaders who can put feelings and ideas into practice and turn them into concrete results for the organization is very important. Leaders such as Steve Jobs, Henry Ford, Jack Welch, Jeff Bezos, or Bill Gates, are illustrations of this. It is hard to imagine what Apple, Ford, General Electric, Amazon.com, or Microsoft would look like without these motivational and visionary leaders [48].

According to Donate and Sanchez De Pablo [7] found that knowledge-oriented leadership positively affected knowledge management's success. Similarly, Akram *et al.* [8] showed that empowering leadership enhanced the relationship between various knowledge management practices, contributing to knowledge management success. In a team context, Jiang, and Chen [9] showed that transformational leadership can provide the right kind of environment and encouragement required for knowledge management success. There is substantial evidence indicating that leadership plays an important role in knowledge management's overall success within organizations.

Lakshman [49] points out that from all perspectives on leadership – such as the trait approach, behavioral approach, contingency approach, transformational approach, and charismatic approach – leadership can be viewed as impacting knowledge management within organizations. Similarly, social exchange theory suggests that how these managers interact and set the stage related to knowledge management can impact its success [50]. Leaders supportive of knowledge management can facilitate the structural, relational, and cognitive aspects necessary not only for promoting knowledge sharing but also for broader knowledge management success within organizations.

The leader must create and encourage a creative climate, a work atmosphere where knowledge is shared, where exchanges with the environment (customers, suppliers, competitors, research centers.) are routine. Batista [42] in his

book on knowledge management in the public sector, talks about the role of leadership for KM. We propose below the roles of leadership in knowledge management and innovation:

- It is the leader who must lead the efforts to implement knowledge management and innovation.
- The leader must reinforce the vision and strategies of knowledge management that must be consistent with the overall goals of the organization.
- The leader is responsible for the allocation of financial resources ensuring the improvement of processes, products, and services.
- The leader is responsible for the allocation of financial resources to ensure the improvement of processes, products, and services.
- The leader is responsible for setting up a policy for the protection of knowledge and innovations (copyright, patents, and security management).
- The leader must create a governance structure and organizational structures (work teams, departments, roles, responsibilities, communities of practice, knowledge networks).
- The leader must create a policy of recognition and rewards for initiatives and superior performance.
- The leader and middle managers must model and practice the values of knowledge sharing, collaborative work, and innovative initiatives.

One of the great challenges for knowledge managers is to ask for efforts from their colleagues without being their superiors or having any formal authority.

A knowledge Manager must be able to persuade people to contribute and share their knowledge for the benefit not only of themselves and their departments but of the whole organization. This requires special methods when it comes to leadership. This means that the knowledge manager also plays the role of a consultant. You need to work closely with your colleagues and be sure that they understand and support the decisions that are made. Otherwise, nothing will get done. At the same time, you need of course to listen to the superior. The various theoretical arguments and empirical studies presented previously allowing us to deduce the second hypothesis:

Hypothesis 1 (H1) “There is a positive relationship between the Management leadership and the application of knowledge management at Abdelmalek Essaadi University from the point of view of teacher-researchers”.

F. Information Technology

Information and communication technologies refer to all techniques used in the processing and transmission of information, mainly computers, the Internet, and telecommunications. By extension, it also refers to the economic sector of information and communication technologies.

Although old, the term technology has begun to be studied seriously as a systematic and formalized field since production techniques have become more complex.

Information Technology (IT) can also, be defined as the set of activities and solutions related to computer resources. IT is

the "hardware-software" package dedicated to the creation of Information Systems (IS) [51]. IT and IS are used by individuals and organizations to support environmental change. They are used by organizations to increase production, improve products and services, and outperform competitors [52].

G. Information Technology and KM

Effective knowledge management (KM) requires the appropriate use of organizational strategies as well as information technology (IT) has greatly boosted knowledge management through the implementation of KMS. IT services supporting knowledge management include database decision support systems, enterprise resource planning systems, expert systems, management information systems, lessons learned systems, etc. In addition, social mechanisms also support knowledge management. On-the-job training, observational learning, face-to-face meetings, mentoring for knowledge sharing, and employee rotation between departments are examples of such mechanisms.

Technology has greatly enhanced the ability of organizations to foster the exchange of information between individuals. Information Technology (IT) has long played a fundamental role in the management of organizations. Initially, the objective was to automate business processes, the simplest tasks that support daily activities. But today the role of IT is mostly strategic [53], [54]. New information and communication technologies can play a strategic role in improving organizational performance and enabling the development of sustainable competitive advantages. Indeed, the role of IT in organizations has evolved from a departmental activity to one that encompasses the entire organization. Hundreds of organizations are using IT as a competitive differentiator, such as Bradesco Bank S.A., Amazon.com, and FedEx. It is fair to say that without new information and communication technologies, KM would not be at the advanced stage it is today. Without them, the socialization and formalization of knowledge would be almost impossible in organizations [47]. But what is the role of IT for KM and innovation? What tools does it have? These questions concern Dimension 5 of this research [48].

Information technologies are present in all KM processes and play an important role in facilitating these processes. They are considered the most effective way to capture, store, transform and disseminate knowledge. And it is certainly thanks to this technological dimension that KM has become more important in organizations today. Despite this role, information technology is seen as an enabler of KM [55].

Technology, the information technologies that support and/or enable KM strategies and operations has been viewed as an enabler for KM, knowledge creation and knowledge sharing [27] in HE. Further, there is a consensus that whilst the use of appropriate information communication technologies can help universities to move towards a knowledge-based learning organization, a 'good fit' between information technology, socio-organizational factors, and sustainable organizational culture is also required [14], [15], [56]. On the other hand, two recent studies disagree on the importance of IT in knowledge sharing. In the UK, Fullwood *et al.* [18] found that academics were neutral as regards the importance of technology, possibly due to their high level of

autonomy and engagement in disciplinary communities. But, in public universities in Malaysia, Ramachandran *et al.* [17], identified IT as the most extensively used KM strategic enabler.

In addition, ICT plays the role of a backup for knowledge stores and knowledge bases in the context of KM. They also facilitate access to and transmission of knowledge and promote interactions between individuals, groups, and organizations. In addition, they can contribute to the knowledge creation process especially in scientific settings [6].

The main factors identified related to information technology that can foster KM are the following [5], [6], [55], [57]:

- a technological infrastructure for access and sharing;
- access to applications;
- technological know-how.

The various theoretical arguments and empirical studies presented previously allowing us to deduce the second hypothesis:

Hypothesis 2 (H2). "There is a positive relationship between the Information Technology and the application of knowledge management at Abdelmalek Essaadi University from the point of view of teacher-researchers".

Fig. 1. The research model.

III. METHOD

A. Research Methodology

Our research is influenced by the inscription of our work in an adequate epistemological paradigm according to the conceptual framework, the hypotheses, the objectives, and the relationship between the variables.

To be precise, we will respond to all the points mentioned above which summarize our epistemological framework and our methodological choice through the table below:

TABLE I: METHODOLOGICAL CHOICES	
Methodological axis	Our choice
Epistemological Paradigm	The post positivism
The current of thought	Scientific realism
reasoning process	The hypothetical-deductive approach
working method	It will be quantitative
empirical method of work	The Survey
Data collection tool	The questionnaire

Source: authors.

B. Data Collection

We administered a questionnaire to a representative sample of 88 teacher-researchers from the various institutions of Abdelmalek Essadi University, the survey was done between September and October 2020.

It seems necessary to us at this point to present an analysis of the sample of our study.

C. Data Collection Instrument: Validity and Reliability

To meet the needs of our study, a questionnaire with nine indices and 40 questions was designed. However, we feel it is necessary to ensure the validity and reliability of our tool.

D. Content Validity

In order to ensure the content validity of our questionnaire, we followed the steps below: First, we conducted extensive research on the topic and then specified the structure of the field under study. Then we consulted specialists in the field of knowledge management and management control, primarily teachers and practitioners, and finally, we made the necessary corrections, we eliminated almost 20 questions and reworded a number of questions to finally have a questionnaire that was valid in terms of content.

E. Analysis of Questionnaire Reliability

To address the issue of the reliability of the questions asked in a test, we calculated Cronbach's alpha coefficient. The table below shows the value of the coefficient for all chapters of our research using SPSS software:

TABLE II: THE RELIABILITY OF THE QUESTIONNAIRE

Study Variables	Chapter	Cronbach's α
Creation	1-4	0.822
Storage	5-7	0.838
Sharing	8-11	0.784
Use	12-15	0.971
Knowledge management	1-15	0.957
Management leadership	16-20	0.815
Information Technology	21-25	0.712

From the data in the table above we notice that the value of Cronbach's alpha for all chapters in our research is between 0.712 and 0.971.

Therefore, these values are well above 0.7 which confirms the internal consistency and reliability of our questionnaire.

IV. ANALYSIS AND RESULTS

A. Descriptive Statistics

1) Application of KM

For the present research, we were interested in measuring the degree of application of knowledge management (creation – storage – sharing – use). For this we proceeded to the calculation of the averages, the standard deviations of the value of T Student as shown in the following table:

TABLE III: DESCRIPTIVE RESULTS FOR K.M IMPLEMENTATION

K.M implementation	Mean	S. D	T value	level
Knowledge creation	2,23	1,05	19,84	low
Knowledge storage	2,07	1,33	14,65	low
Knowledge sharing	2,71	0,98	25,88	Medium
Knowledge use	2,12	1,14	17,54	low
Overall average	2,29	1,12	19,48	low

The T value in the table = 1.96, with a significance level $\alpha = 0.05$, and a mean level between (2.34 and 3.67).

These results clearly illustrate insufficiency practice of the K.M implementation operations (creation-sharing-storage-and use of knowledge) at the level of the various institutions of the Abdelmalek Essaadi University from the point of view of teachers.

2) Management Leadership

TABLE IV: DESCRIPTIVE RESULTS FOR MANAGEMENT LEADERSHIP

Management leadership	Mean	S. D	Level
university administration presented by these leaders can influence teachers.	2,54	0,99	Medium
The university administration integrates staff members at all levels in the construction of decisions.	2,18	0,83	Low
The university administration encourages teachers to present their ideas and proposals.	2,19	0,83	Low
University administration practices Justice in incentives and rewards among teachers.	2,09	0,79	Low
The administration provides teachers with opportunities for continuous learning and development.	1,72	0,86	Low
Overall average	2,14	0,65	Low

The T value in the table = 1.96, with a significance level $\alpha = 0.05$, and a mean level between (2.34 and 3.67)

According to the above results, we notice that the existing management leadership at the level of the different institutions of Abdelmalek Essaadi University does not support the (KM) application.

3) Information Technology

TABLE V: DESCRIPTIVE RESULTS OF THE INFORMATION AND COMMUNICATION TECHNOLOGY

Information Technology	Mean	S. D	Level
At the university, there is a general Internet access service for all teachers-researchers.	2,63	1,15	Medium
The existing IT infrastructure offers an internal information network to access databases (computers, archiving systems).	2,39	0,88	Low
The university is committed to organizing electronic forums that contribute to the documentation and exchange of knowledge.	2,36	0,98	Low
The university has an electronic infrastructure that contributes to the holding of teleconferences and the sharing of experiences at a distance.	2,09	0,79	Low
The administration has an electronic library that allows teachers-researchers to take advantage of it.	2,00	1,21	Low
Overall average	2,29	0,51	Low

According to the above results, we notice that the Information and communication technologies infrastructure of the different institutions of Abdelmalek Essaadi University does not favor (KM) implementation.

B. Hypotheses Testing

1) Testing the First Central Hypothesis

TABLE VI: CORRELATION COEFFICIENT BETWEEN LEADERSHIP AND K.M APPLICATION

Axis	Pearson Correlation	Sig
management leadership	0.635	0.001

From the Table VI we notice that the Pearson correlation coefficient value $r = 0.635$ confirms the positive relationship between leadership and (KM) at the different institutions of Abdelmalek Essaadi University from the point of view of teacher-researchers with a level of significance α less than 0.05.

2) Testing the Second Hypothesis

TABLE VII: CORRELATION COEFFICIENT BETWEEN INFORMATION TECHNOLOGY AND KM

Axis	Pearson Correlation	Sig
Information Technology	0.554	0.001

From the Table VII: we notice that the Pearson correlation coefficient value $r = 0.554$ confirms the positive relationship between Information technology and (KM) at the different institutions of Abdelmalek Essaadi University from the point of view of teacher-researchers with a level of significance α less than 0.05.

V. DISCUSSIONS

A. Confirmatory Discussion of the Hypotheses

1) Management Leadership

The results collected in Table VII reflect the presence of a management leadership not conducive to KM implementation in the various institutions of Abdelmalek Essaadi University from the point of view of teachers. These results coincide with the findings of the study conducted by Donate and Sanchez De Pablo [7] which found that knowledge-oriented leadership positively affected knowledge management's success. Similarly, Akram *et al.* [9] showed that empowering leadership enhanced the relationship between various knowledge management practices, contributing to knowledge management success.

Also, Jiang and Chen [8] showed that transformational leadership can provide the right kind of environment and encouragement required for knowledge management success. There is substantial evidence indicating that leadership plays an important role in knowledge management's overall success within organizations [10]-[12].

On the other hand, our results disagree with the results obtained by al Talbani *et al.* [58] that records a high level of presence of factors (culture, structure, leadership, and ICT) facilitating the application of knowledge management at the level of all universities in the Gaza Strip in Palestine from the point of view of 241 participants between administrators and teachers.

This result leads the university leaders to provide more effort to improve the quality of management Leadership in Abdelmalek Essaadi University through:

- the integration of teachers at all levels in the construction of decisions.
- The encouragement of teacher-researchers to present their ideas and proposals.
- The practice of fairness in incentives and rewards among faculty researchers.

2) Information Technology

Also, the results obtained in the table: 8 indicate that the current Information Technology structure at the level of different institutions of Abdelmalek Essaadi University from the point of view of teachers is not suitable for the KM at the university.

Note that these results coincide with several Researchers who have identified the positive impact of information technology (IT) artifacts to support the creation, storage, retrieval, transfer, and application of knowledge in organizations [5], [6], [55], [57].

In addition, information technologies support KM strategies and operations [13] or has been viewed as an enabler for KM [14]-[17], knowledge creation and knowledge sharing [18] in higher education.

This result leads the university leaders to provide more

effort to improve IT infrastructure in Abdelmalek Essaadi University through:

- The involvement of the university in the organization of electronic forums that contribute to the documentation and exchange of knowledge.
- the presence of an electronic library allowing teachers-researchers to take advantage of it.

3) Test of the Theoretical Model

The figure below presents the results confirming the positive relationship between our variables (Pearson's correlation coefficient is greater than 0.5 for all relationships between variables). This validates both hypotheses of this research and proves the validity of our hypothetical research model:

Fig. 2. Test of the theoretical model.

VI. CONCLUSION

This research explored the knowledge management in Moroccan higher educational institutions through Abdelmalek Essaadi University and verified the presence of Human and Technological Factors for K.M implementation.

The study found a positive relationship between the requirements of Knowledge management (Management leadership and I.T) and the application of knowledge management in Moroccan universities with a Pearson correlation rate > 0.5 . also, the results obtained show insufficiency presence of initiatives for a (K.M) which remains consistent with our previous similar studies [59], [60], [61], [62].

according to the theoretical point of view, this article has the particularity of mobilizing a rich theoretical corpus, consisting primarily of the theory of knowledge (Knowledge-Based View), and the approach of keys success factors.

while, the empirical phase of our work used a quantitative approach, an approach that is increasingly developed in management sciences and precisely the study of higher educational institutions.

Additionally, an increase in the size of our samples per establishment could perhaps better explain the influence of knowledge management for each establishment. As well, the choice of a single region (Tangier-Tetouan-Al Hoceima) in this article pushes us to expand our field of work for future work to cover the national territory in its entirety.

further, in our future work, we will study other success factors of knowledge management initiatives such as culture, and structure.

Moreover, it should be noted that this research has important implications for the leaders of Moroccan universities. The confirmation of the hypotheses of our work reminds us that each university must clearly define its

strategy based on better knowledge management as a cornerstone of any action aiming at excellence and organizational performance, and consequently the improvement of its competitiveness at the international level.

Finally, our research constitutes a line of thought for researchers wishing to strengthen research related to knowledge management in the university environment and especially in Morocco.

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