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EXPLORANDO O PAPEL DAS COMPETÊNCIAS E DA MORAL DOS EDUCADORES NA INTEGRAÇÃO DAS TIC NAS UNIVERSIDADES

EXPLORING THE ROLE OF EDUCATOR COMPETENCIES AND MORALE IN ICT INTEGRATION AT UNIVERSITIES

EXPLORANDO EL PAPEL DE LAS COMPETENCIAS Y LA MORAL DE LOS EDUCADORES EN LA INTEGRACIÓN DE LAS TIC EN LA UNIVERSIDADES

Soufiane Elmouhib[1,2,3,4] *https://orcid.org/0009-0007-6594-7229*
Abdelkerim Moussa[1,2]
Nouha Amrani [1,2,3,4]

[1] Laboratory of Studies and Research in Management of Organizations and Territories (ERMOT), Fez, Morocco
[2] Sidi Mohamed Bem Abdellah University, Fez, Morocco
[3] Laboratory of Multidisciplinary Research (LAREM), Fez, Morocco
[4] HECF Business School, Fez, Morocco

Soufiane Elmouhib – soufiane.elmouhib@usmba.ac.ma| Abdelkerim Moussa – albdelkarim.moussa@usmba.ac.ma |
Nouha Amrani – nouha.amrani@usmba.ac.ma

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Corresponding Author:
Elmouhib Soufiane
Boughafer Street
30060 – Fez - Marocco
soufiane.elmouhib@usmba.ac.ma

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RESUMO

Introdução: As reformas educacionais em curso destacam a necessidade crítica de integrar as Tecnologias de Informação e Comunicação (TIC) no ensino superior. No entanto, barreiras socioeconômicas e de infraestrutura apresentam desafios significativos para a adoção generalizada de TIC, especialmente no desenvolvimento de estratégias abrangentes dentro dos sistemas educacionais.
Objetivo: Explorar como melhorar as competências em TIC e a moral dos professores para apoiar uma integração eficaz das TIC no ensino superior.
Métodos: Foi realizada uma pesquisa transversal com 653 educadores em diversas instituições, avaliando suas habilidades em TIC, moral e uso de TIC em contextos de ensino. Utilizou-se o Modelo de Equações Estruturais (SEM) para analisar o impacto das competências técnicas e da moral na adoção de TIC em sala de aula.
Resultados: A análise SEM indica que tanto as competências em TIC ($\beta = 0,531$, $p < 0,01$) quanto a moral ($\beta = 0,456$, $p < 0,01$) são preditores significativos da integração de TIC. Esses achados destacam a importância tanto da proficiência técnica quanto de uma atitude positiva em relação à tecnologia como impulsionadores essenciais para o uso eficaz de TIC em contextos educacionais.
Conclusão: Os resultados reforçam a necessidade de programas de formação docente personalizados para desenvolver habilidades em TIC e a importância de fomentar um ambiente de apoio para manter alta moral. Este estudo delineia uma abordagem fundamental para transformar o ensino superior, alinhando-o aos padrões globais por meio de uma integração aprimorada das TIC.

Palavras-chave: integração de TIC; competências dos professores; moral dos professores; ensino superior; sistema educacional

ABSTRACT

Introduction: Ongoing educational reforms emphasize the critical need to integrate Information and Communication Technology (ICT) into higher education. However, socio-economic and infrastructural barriers present significant challenges to widespread ICT adoption, particularly in developing comprehensive strategies within educational systems.
Objective: To explore ways of improving teachers' ICT skills and morale in order to support the effective integration of ICT into higher education.
Methods: A cross-sectional survey was conducted with 653 educators across Moroccan institutions, assessing their ICT skills, morale, and ICT usage in instructional settings. Structural Equation Modeling (SEM) was used to analyze the impact of technical competencies and morale on ICT adoption in the classroom.
Results: The SEM analysis indicates that both ICT competencies ($\beta = 0.531$, $p < 0.01$) and morale ($\beta = 0.456$, $p < 0.01$) are significant predictors of ICT integration. These findings highlight the importance of both technical proficiency and a positive attitude towards technology as essential drivers for effective ICT utilization in educational contexts.
Conclusion: The findings underscore the need for tailored teacher training programmes to develop ICT skills and the importance of fostering a supportive environment to maintain high morale. This study outlines a key approach to transforming higher education, bringing it into line with global standards through the enhanced integration of ICT.

Keywords: ICT integration; teacher competencies; teacher morale; higher education; moroccan education system

RESUMEN

Introducción: Las reformas educativas en curso destacan la necesidad crítica de integrar las Tecnologías de la Información y la Comunicación (TIC) en la educación superior. Sin embargo, las barreras socioeconómicas e infraestructurales presentan desafíos significativos para la adopción generalizada de las TIC, especialmente en el desarrollo de estrategias comprensivas dentro de los sistemas educativos.
Objetivo: Analizar cómo mejorar las competencias en TIC y la motivación del profesorado para favorecer una integración eficaz de las TIC en la educación superior.
Métodos: Se realizó una encuesta transversal con 653 educadores en diversas instituciones, evaluando sus habilidades en TIC, moral y uso de TIC en entornos de instrucción. Se utilizó el Modelado de Ecuaciones Estructurales (SEM) para analizar el impacto de las competencias técnicas y la moral en la adopción de TIC en el aula.
Resultados: El análisis SEM indica que tanto las competencias en TIC ($\beta = 0.531$, $p < 0.01$) como la moral ($\beta = 0.456$, $p < 0.01$) son predictores significativos de la integración de TIC. Estos hallazgos destacan la importancia tanto de la competencia técnica como de una actitud positiva hacia la tecnología como impulsores esenciales para el uso efectivo de TIC en contextos educativos.
Conclusión: Los resultados refuerzan la necesidad de programas de formación docente personalizados para desarrollar competencias en TIC, así como la importancia de fomentar un entorno propicio para mantener una alta moral. Este estudio esboza un enfoque fundamental para transformar la educación superior, alineándola con los estándares mundiales mediante una mayor integración de las TIC.

Palabras clave: integración de TIC; competencias docentes; moral docente; educación superior; sistema educativo

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INTRODUCTION

Rapid growth in Information and Communication Technology (ICT) has significantly transformed the educational outlook globally. With technology becoming integral to daily life, there is increasing demand for using ICT in pedagogical practices in educational institutions (Deshpande & Shesh, 2020). This kind of integration into education is thus believed to be important for the enhancement of education, innovative teaching methods, and effective student development to prepare students to meet the demands of the globalized economy (Upadhayaya, 2023).

In fact, almost every country in the world has implemented policies to modernize its education system by improving the ICT competencies of teachers and promoting effective use of digital tools in classrooms. For example, in developing countries like Morocco, educational reforms are underway; therefore, integration of ICT is an important factor that will improve the quality of learning and compliance with international standards (Riyami et al., 2019). But even with these attempts, the biggest challenges arise in infrastructure, teacher preparedness, and equitable access to technology.

This fact renders the integration of ICT in HEIs crucial for Morocco, as while being highly in need of improvement concerning the quality of education, the country also identifies the level of digital literacy as one of the major drivers of development (Elatrachi & Oukarfi, 2020). Moroccan HEIs have been faced with modernization challenges regarding their teaching practices given the fast-evolving demands on human resources in a technologically driven global economy (Riyami et al., 2019). Thus, ICT can alleviate resource constraints, geographical divides, and the growing imperative for more student-centered learning environments (Makewa et al., 2014). The present research examines the impact that teachers' ICT competencies and morale have on classroom technology adoption. Its findings have direct usefulness for Moroccan policy makers and education leaders in applying informed policies. The findings from this study should therefore inform effective teacher training programs in ways that create supportive environments for ICT use to improve educational outcomes and contribute to wider educational reforms in the country.

While many studies have investigated the role of teachers' competencies in ICT and morale regarding influencing technology integration in education, most of the literature focuses on countries with advanced infrastructures in information and communication technologies (Buabeng-Andoh, 2012; Rana & Rana, 2020; Tomaro, 2018). Those factors that pose a special challenge and create opportunities in ICT integration in developing regions like Morocco have been rarely explored. Furthermore, although the role of teacher morale is widely noted within discussions of ICT adoption, there is little evidence that investigates the combined impacts of both ICT competencies and morale on ICT integration amongst Moroccan HEIs. The current paper attempts to fill this gap by providing data about Moroccan educators and giving clues as to how these factors interact within the context of the current educational reforms undertaken by the country.

Given the importance of integrating ICT to enhance educational quality and the gaps in the literature, this study seeks to answer the following research question: To what extent do teachers' ICT competencies and morale influence the integration of ICT into teaching

practices in Moroccan higher education institutions? This question should therefore be useful in gaining valuable insights to inform efforts toward effective use of ICT in Moroccan classrooms, hence contributing to the broader goal of modernizing education.

1. LITERATURE REVIEW

1.1. Conceptual delimitation

To understand the dynamics involved in incorporating ICT into educational settings, one must first identify and clearly define three important terms that undergird this phenomenon: teachers' integration of ICT, teachers' ICT competencies, and teacher morale.

ICT integration refers to the process by which teachers incorporate digital tools and resources into their pedagogical practices to enhance the learning experience. It is not merely the use of technology for technology's sake but rather the purposeful and strategic implementation of ICT to improve teaching outcomes. According to the model proposed by Suárez-Rodríguez et al. (2018), ICT integration is a multifaceted process that is dependent on both the technological and pedagogical competencies of teachers. This process entails not only the utilization of ICT tools but also the transformation of teaching methods to align with the capabilities and affordances of these technologies (Suárez et al., 2018). From this perspective, ICT integration is, therefore, bound by the interplay of personal and contextual factors: the pre-service teachers' beliefs, attitudes toward technology use, and institutional support. Studies have suggested that this calls for a shift from an instrumentalist view of technology to an integrative approach wherein technology reshapes education in attaining deeper learning and engagement (Uslu & Usluel, 2019).

Teachers' ICT competencies represent the combination of skills, knowledge, and attitudes that enable them to effectively use digital technologies in their teaching practices. The competencies have usually been divided into two related yet distinct domains: technological and pedagogical competencies. Technological competencies involve a teacher's ability to use and troubleshoot digital tools.

Pedagogical competencies relate to their ability to apply these tools in such ways that will enhance learning outcomes. The relation between these competencies is, however, bidirectional since technological knowledge determines the pedagogical application and vice versa (Almerich et al., 2016).

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Teacher morale is a psychological construct representing an individual teacher's general feeling of satisfaction, motivation, and well-being due to his or her professional role. It has increasingly been noted that ICT competencies and integration go a long way to affect teacher morale. For instance, high levels of self-efficacy and competence in ICT boost morale by increasing an individual teacher's confidence and reducing the anxiety associated with new technologies. Tasir et al. showed in 2012 that the greater the ICT competencies of teachers, the greater the job satisfaction due to perceived abilities in engaging students and realizing educational outcomes (Tasir et al., 2012).

1.2. Hypothesis

Indeed, the use of ICT in teaching practices directly depends on the teacher's competencies in using ICT. Several studies have already shown that higher levels of competence among teachers will lead to a better integration of technology into their classroom practices. For example, some studies have found that the technological and pedagogical competencies of teachers, while enhancing their professionalism, especially in respect of the use of ICT, are extended to classroom use as well (Suárez et al., 2018). In addition, perceived competence in ICT significantly predicts the extent to which teachers will integrate ICT in their teaching (Aslan & Zhu, 2017). Such competencies are not confined to technical aspects only but also extend to pedagogical competence in integrating such tools in a productive manner in lesson delivery, hence ensuring the successful integration of ICT in classrooms.
Factors such as motivation, job satisfaction, and attitudes toward teaching all contribute to teachers' morale and are crucial in determining the effectiveness of integrating ICT in classrooms (Schulz et al., 2015). Research has shown that a high level of morale among teachers correlates with a more positive attitude toward new teaching
practices, which would include ICT integration in their classes. In most instances,
it is inferred that teachers' beliefs, attitudes, and perceptions concerning the adoption of technology emanate from a general feeling of satisfaction and confidence in the job; factors encapsulated in morale. In this regard, it has been established that when ICT tools are perceived positively and motivational, there is the likelihood that such tools would be put to effective practice in teaching (Sang et al., 2011). Moreover, it influences teachers to be interested in professional development programs in improving their skills regarding ICT integration (Ghavifekr & Rosdy, 2015).
According to this discussion, we can propose the following hypothesis:
H1: Teachers' ICT competencies are positively associated with the integration of ICT into their teaching practices.
H2: Teacher morale is positively associated with the integration of ICT into teaching practices.

2. METHODS

2.1. Measurement

The constructs and items utilized in this study were adapted from previous research to ensure their relevance and suitability for the context of ICT integration and teacher morale (Hsu, 2010; Rempel & Bentley, 1964; Tondeur et al., 2017). The questionnaire was developed in French, the primary language used in the educational institutions where the research took place, to ensure the clarity and precision of the measures. When translation was necessary, a rigorous back-translation process was employed, whereby the items were first translated from English to French and then independently back-translated to English to verify the accuracy and consistency of the meaning.
The questionnaire assessed the main constructs in the conceptual model. Each construct was evaluated using established scales from previous studies (Hsu, 2010; Rempel & Bentley, 1964; Tondeur et al., 2017). For example, teachers' ICT competencies were measured using a scale adapted from Tondeur (2017), which encompasses both technological and pedagogical competencies. Teacher morale was evaluated through items from validated scales that measure job satisfaction and motivation within an educational context.
The level of ICT integration in classrooms was measured through items that capture how
extensively teachers incorporate ICT tools into their teaching. Additionally, demographic questions were included to gather information on respondents' age, gender, teaching experience, and education level. These demographic variables provided essential context for analyzing the sample and examining potential moderating effects on the relationships between the main constructs.
All items were scored on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), allowing for detailed responses on teachers' perceptions of their ICT competencies, morale, and ICT integration practices.

2.2. Sample and data collection

The research was conducted with faculty members from both private and public higher education institutions in Morocco. A total of 692 questionnaires were distributed, of which 653 valid responses were collected, yielding a response rate of 94.4%. Although precise data on the total number of faculty members in Moroccan private and public higher education institutions is unavailable, the sample size of 653 respondents is considered significant based on previous studies. As Ghavifekr and Rosdy (2015) observed, this may be regarded as sufficient for generalizing results, especially in large populations, in educational research in which

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population data is uncertain (Ghavifekr & Rosdy, 2015). Thus, the sample in the present study provides robust data for analysis and meaningful insights into the ICT competencies, morale, and integration practices of Moroccan higher education faculty.

A voluntary selection method was applied in the data collection process, whereby faculty members from private and public institutions were invited to participate using a range of digital platforms, including Facebook, WhatsApp, LinkedIn Messenger, and email. This ensured broad and diverse outreach that captured representative samples of faculty perspectives from different educational settings. This method was particularly effective during the period of data collection, especially with reliance on the digital channels of communication. This is because it ensured that the survey was more accessible and convenient for the respondents. Even though voluntary sampling is not a random method, it is a method commonly utilized in educational research where the researcher may not have direct access to the respondents through institutional channels (Murairwa, 2015).

3. RESULTS

3.1 Descriptive statistics

Table 1 summarizes the descriptive statistics describing the gender and regional distribution of the respondents in this study. The distribution indicates that 45% of the total respondents were women, totaling 293, while men were 55%, amounting to 359. This slight predominance of male respondents would therefore show that both genders were relatively well-represented in the study for a fairly balanced perspective in examining gender-related factors in the research. It represents a close relation between the number of male and female participants, ensuring that the conclusion from this study cuts across both genders. For the regional distribution, the region that is most represented is the Fès-Meknès region, represented by 248 participants, accounting for about 38% of the sample. Thus, Fès-Meknès is the most highly represented region in this study. It is followed by the Casablanca-Settat region, which includes 189 respondents and accounts for 29% of the sample. Both regions are important centers of urban and educational facilities; this probably explains their higher representation. The Marrakech-Safi region contributed a proportionate share of 137 respondents, representing 21% of the total sample size.

The remaining regions have smaller participation: the region of Rabat-Salé-Kénitra with 65 participants, or 10% of the sample. The Tanger-Tétouan-Al Hoceïma region has the lowest representation, given that its 13 respondents correspond to a mere 2% of the total sample. This might be due to factors such as fewer faculty populations being present within those regions or lesser accessibility to channels through which the questionnaire was distributed.

Table 1 - Demographic Distribution of Respondents by Gender and Region

Attributes	Characteristic	Frequency	Percentage (%)
Gender	Female	293	45.00%
Gender	Male	359	55.00%
	Fès-Meknès	248	38.00%
	Casablanca-Settat	189	29.00%
Region	Marrakech-Safi	137	21.00%
	Rabat-Salé-Kénitra	65	10.00%
	Tanger-Tétouan-Al Hoceïma	13	2.00%

3.2 Assessment of Measurement Model

Convergent validity is the construct that ensures the critical aspect of measurement in research. That is, each set of items used to address the particular constructs must be representative of the measured concept. In order to assess convergent validity, generally the following indicators are considered: factor loadings, Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE).

The factor loadings in this study for each construct mostly exceed 0.7, which, according to many empirical studies, is the minimum threshold acceptable for the establishment of convergent validity. If the factor loading is above 0.7, it indicates that there is a strong relationship between the item and its respective constructs; it means that the item is a good indicator of the measured concept (Ahrens et al., 2020; Yusoff, 2011). For example, most items of the variable IICT are above 0.7; for instance, IICT4 with 0.872 and IICT6 with 0.882, which means that they are highly correlated with the measured construct. Although items such as IICT3 at 0.689 and IICT8 at 0.693 were lower than the threshold of 0.7, these are still relatively within range to infer a fairly strong relationship. There is evidence in the literature that some items may fall slightly beneath loading criteria and yet still retain their worth (Stevenson, 1982).

Cronbach's Alpha is a statistic that calculates internal consistency for each construct to ensure that the items measure the same underlying concept. In this study, all constructs have high CA values: IICT has an alpha of 0.911, TC 0.863, and TM 0.895. Overall, these are well above the threshold of

0.7 for acceptable levels and hence internally reliable. This means in every construct, the items are consistently measuring the same concept, which is a key fact to be taken into consideration to the accuracy of the research findings. Cronbach's Alpha is one

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of the most applied estimators of reliability in empirical research, while a threshold of 0.7 is good enough to establish consistency (Peterson & Kim, 2013).

The Composite Reliability is yet another measure of internal consistency, useful when the evaluation of structural models is considered. According to Table 2, all CR values are much better than the recommended threshold value, 0.7 (Raykov, 1998). IICT has a CR of 0.926, TC a CR of 0.864, and TM a CR of 0.898. These high Composite Reliability (CR) values indicate that the constructs are dependable. Specifically, the items within each construct consistently measure the intended concept, ensuring reliable assessments. The CR is therefore considered to be more accurate as opposed to Cronbach's Alpha in situations that deal with latent constructs, further reinforcing the reliability of this study (Raykov, 1998).

AVE is an important indicator to evaluate convergent validity; it can determine the proportion of variance in the construct that is attributable to measurement error. All the constructs have an AVE greater than the threshold of 0.5 (Yusoff, 2011), and these include Integration of ICT at 0.620, Teachers' ICT Competencies at 0.594, and that of Teacher Morale at 0.615. Those results confirm that a large portion of the items' variance is captured by the respective constructs, thereby confirming the study's convergent validity.

Table 2 - Convergent validity (n=653)

Constructs	Loadings	CA	CR	AVE	Constructs	Loadings	CA	CR	AVE
Integration of ICT		0.911	0.926	0.620	Teachers' ICT Competencies		0.863	0.864	0.594
IICT1	0.761				TC1	0.788			
IICT2	0.734				TC2	0.740			
IICT3	0.689				TC3	0.803			
IICT4	0.872				TC4	0.746			
IICT5	0.822				TC5	0.799			
IICT6	0.882				TC6	0.744			
IICT7	0.819				Teacher Morale (TM)		0.895	0.898	0.615
IICT8	0.693				TM1	0.815			
					TM2	0.740			
					TM3	0.831			
					TM4	0.753			
					TM5	0.808			
					TM6	0.733			

Following Table 3, the HTMT results explain the discriminant validity of constructs, which is an important component of structural equation modeling, where every construct has to be different from other related constructs and measure the concept that it is supposed to measure (Roemer et al., 2021).

The HTMT value between IICT and TC is 0.868, falling below the threshold of 0.90, thus implying these two constructs, although closely related, are distinct. It also makes perfect sense that these constructs should be highly related because a teacher's competence in ICT would be expected to ensure they are capable of integrating such technologies into their teaching. However, its inability to exceed the threshold of 0.90 shows that the two constructs are separable enough to be included as two separate constructs in the measurement model (Raykov, 1998).

The HTMT between IICT and TM is 0.811, which is comfortably below the threshold of 0.90, meaning that even though teacher morale may have some influence on integration, they are separate constructs. Morale generally refers to the overall job satisfaction and emotional state of a teacher, while integration of ICT is a professional competency. Thus, the moderate correlation realized here is expected but does not suggest that the two constructs overlap.

As such, the HTMT value for Teachers' ICT Competencies (TC) with Teacher Morale (TM) is 0.624, far from the threshold level of 0.90. With a lower correlation, this indicates that competence in ICT by a teacher differs from
their general morale. While greater competence in ICT might translate into higher confidence and, finally, higher morale, the constructs are separate entities (Peterson & Kim, 2013).

Table 3 - Heterotrait-Monotrait ratio (HTMT)

	IICT	TC	TM
IICT			
TC	0.868		
TM	0.811	0.624	

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3.3 Analysis of Structural Model

Analysis in Table 4 shows that TC significantly and positively contributed to the variation in IICT, with a path coefficient of β = 0.531. Also, the significance level is below 0.01, hence the hypothesis that the more competent the teachers are in information and communication technology, the better their integration of technology into pedagogical practices is supported. It underscores the increasing importance of ICT competencies in the new pedagogies.

Table 4 - Direct effects

Hypotheses	Relationships	Findings	Results
H1	Teachers' ICT Competencies (TC) → IICT	Positive and significant (β = 0.531; P < 0.01)	Supported
H2	Teacher Morale (TM) → IICT	Positive and significant (β = 0.456; P < 0.01)	Supported

Again, it was noticed that TM could positively and significantly influence the integration of ICT into teaching practices, β = 0.456. Wherein the path was statistically significant at P < 0.01. This positive path coefficient indicates that higher morale would be expressed by those teachers who can create more inclination toward integrating ICT into their teaching activities. This leads to the conclusion that innovation and modern tool utilization in education are prompted by a positive work environment and morale.

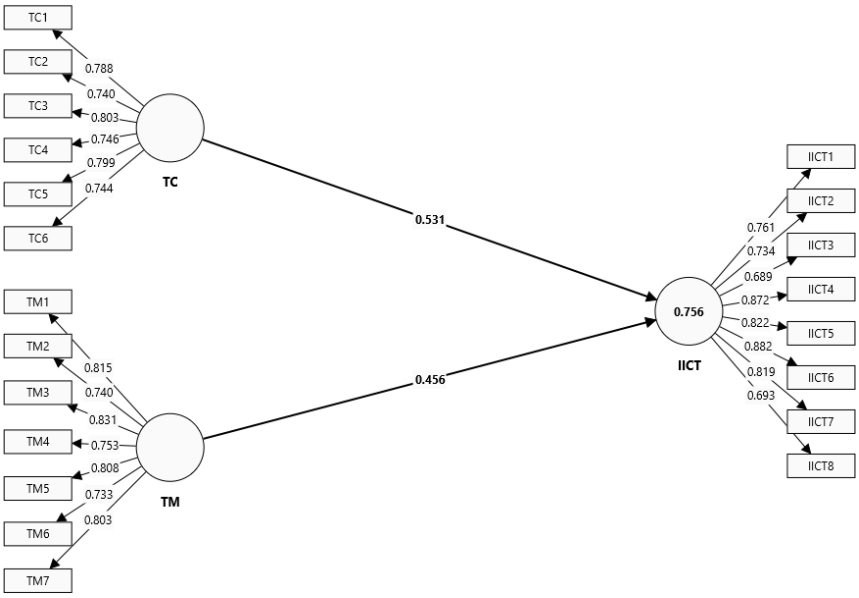

Figure 1 - Measurement and structural model

4. DISCUSSION

4.1. Theoretical Implications

The study supports the existing literature, which affirms that higher competencies are associated with a greater intensity of ICT integration into teaching (Suárez et al., 2018). Since competence is one of the main drivers, the enhancement efforts in ICT integration aim at developing technological and pedagogical skills. This investigation underlined that training courses may improve perceived competence and support the integration of ICT (Aslan & Zhu, 2017). This paper further develops this idea by proposing that teacher morale—in the form of positive attitudes toward technology—positively supports the integration of ICT. Thus, professional development should cover not only the skills but also the teacher's confidence and satisfaction enhancement, which are very important for their willingness to adopt technology. Higher education institutions should therefore create supportive environments through which high morale is stimulated in order to further enhance the integration of ICT (Tasir et al., 2012).

Lastly, our findings agree that the integration of ICT is basically driven by the beliefs and attitudes of the educators (Sang et al., 2011). Positive attitudes, as consolidated by training and school culture, are essential in developing effective uses of technology within education.

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4.2 Practical Implications

Given the current national educational reforms and the strategic focus on enhancing digital literacy, it is important for Moroccan educational authorities to prioritize the development of holistic training workshops. These workshops should provide practical, hands-on experience with ICT tools and offer pedagogical strategies for meaningful and innovative technology use in classrooms. Results concerning teacher morale suggest that professional development alone is insufficient to ensure successful ICT adoption. Moroccan institutions need to cultivate a supportive work environment that not only provides access to technological tools but also recognizes and rewards innovative ICT use.

The research underscores the need for ongoing professional development to keep Moroccan educators updated with evolving technological trends. Continuous workshops that introduce new tools, best practices, and opportunities for reflection are essential for maintaining and boosting teachers' confidence and morale. Implementing ICT mentoring or coaching programs in Morocco, where experienced faculty can guide their peers in navigating new technologies, will help foster a collaborative community of practice.

Finally, the study emphasizes the necessity of fostering a university culture that values technology as a core component of teaching, an implication that is highly relevant to Morocco's educational aspirations.

CONCLUSION

Understanding the integration of ICT in Moroccan higher education institutions is complex, influenced by factors such as government policies, organizational innovation, and faculty digital competencies. Therefore, this paper adopts a faculty perspective to explore the factors identified in the literature that may enhance or inhibit this integration.

The results of the Structural Equation Modeling (SEM) underscore the positive relationship between teacher morale and teachers' ICT competencies on the integration of ICT technologies. This highlights the importance of considering these factors in institutional digital strategies. Strategies could include integrating workshops to develop faculty competencies, coaching programs, and developing a fostering work environment to maintain good morale.

However, this paper highlights several limitations that could be addressed in future research. First, the voluntary sampling method implies that teachers who felt more confident users of ICT or who held more positive attitudes toward technology may also have been more likely to respond to the survey and thus could have biased the results in a positive direction concerning their perceptions. Besides, due to the lack of complete demographic information about
the whole population of Moroccan higher education faculty, verification of the sample's representativeness could not be carried out. While the tools for collecting data online are effective, access to such platforms presents some limitations. Some teachers who do not typically use or have access to these kinds of platforms might have been excluded from this study and may therefore be under-represented.

Though it adds a great deal to the Moroccan context, the implications of this study should be generalized to other countries or educational systems with caution. In fact, socioeconomic conditions, regional disparities, and differences in ICT infrastructure in education are very particular in Morocco; this implies that these findings may not be generalized directly to other contexts, especially in countries with advanced or underdeveloped ICT ecosystems. Therefore, for the establishment of how such findings apply in wider contexts, more comparative studies in other countries or regions would be needed.

AUTHORS' CONTRIBUTION

Conceptualization, S.E., N.A. and A.M.; data curation, S.E. and N.A.; formal analysis, S.E. and N.A.; investigation, S.E.; methodology, S.E.; project administration, S.E.; resources, S.E.; software, S.E. and N.A.; supervision, S.E., A.M.; validation, S.E., A.M., and N.A.; visualization, S.E., A.M., and N.A.; writing-original draft, S.E.; writing-review and editing, S.E., N.A., and A.M.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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