Technology and Engineering of Distance Learning in the Field of Health: Case of Morocco

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ABSTRACT

The setting up of continuing distance education centers at the regional level is a complex process that influences many determinants favoring and hindering this pedagogical project with great added value. **The objective of this study** is to identify and analyze the determinants of the establishment of regional distance training centers (E-learning). **Materials and Methods:** To do this, we conducted an exploratory quantitative study aimed at describing the factors involved in setting up regional centers for distance education. Indeed, the data collection was based on questionnaires adapted according to the Likert scale, with the persons in charge and managers of the continuous training process at the regional level. **Results:** According to the results of our study, we have noted the main factors that can influence the creation, management and proper functioning of these centers, in particular the political and strategic issues of the Ministry of Health and Social Protection, which demonstrate the interest and importance of distance learning in meeting the needs and expectations in terms of developing the skills and knowledge of health professionals. Secondly, we found that the degree of commitment of decision-makers and the quality of leadership of managers, in setting up online learning platforms, advanced technological devices and the adaptation of educational content in relation to programs. **Conclusion:** the establishment of continuing distance education centers also depends on the ability to overcome and deal with obstacles related to resistance to change, the availability of infrastructure, and the quality of training, while leveraging benefits related to technology, training needs, flexibility and cost reduction.

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1. INTRODUCTION

Human capital formation is an essential element in realizing the right to health, as stipulated in article 31 of the Moroccan constitution of 2011. Indeed, all State institutions and bodies must act by mobilizing all the means at their disposal to facilitate equal access for citizens to the conditions enabling them to enjoy the rights: to health care, to modern, accessible and quality education and to vocational training and physical and artistic education [2]. In addition, this right was materialized by Dahir n°1-15-83 of 20 of July 7, 2015, promulgating the organic law n°111-14 relating to the regions, allowing the regions the improvement of its competencies and its capacities to manage regional human resources, while ensuring their training [3].

Within this regulatory framework, the development of healthcare professionals' scientific, managerial and technical skills and knowledge can only be achieved through ongoing training and assessment of knowledge and know-how. However, the central administration and regional health departments are faced with major challenges characterized by increasingly diverse technological advances, the needs and demands of the ever-growing population, new expectations of human resources and multiple reform projects, notably the modernization of the public service and advanced regionalization [4].

Progress and advances in new technological tools and methods have facilitated the use of distance learning, opening up new opportunities for all professionals thanks to improved access to resources, increased interaction between trainers and participants, and flexibility and adaptability of location and time. Nevertheless, distance learning (e-learning) presents new challenges as the roles and expectations of staff and professionals evolve. Adapting and contextualizing distance learning approaches requires the development of new skills and changes in pedagogical practices and tools [5].

Since distance continuing education centers enable an exchange model to be developed using IT technologies, this implies various cultural, environmental and behavioral changes to move from face-to-face teaching to online or web-based teaching, where teachers and learners are obliged to exchange knowledge and know-how [6]. By focusing on the ever-increasing role of digital technology in distance learning, as one of the four strategic axes in the redesign of the national health system, as stipulated by framework law 06-22 on the national health system, promulgated on December 9, 2022 [7]. Distance learning centers can have significant benefits and impact on healthcare organization.

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In fact, setting up regional distance continuing education centers requires the commitment of decision-makers to organize and put in place the mechanisms to be deployed to ensure the quality and performance of the learning process, and to highlight the contextual conditions that facilitate or hinder this process.

Effective management of distance learning centers presents some unique challenges due to the virtual nature of learning and the specific needs of distance learners. Common managerial issues associated with distance learning centers are often encountered. Taking all these findings into consideration, to address these issues and contribute to the establishment of regional continuing education distance learning centers, this work set out to study the determinants of the establishment of continuing education distance learning centers for health organizations at the level of Moroccan health regions.

2. MATERIAL AND METHOD

This is an exploratory study, the first of its kind in Morocco, conducted over a period of four months, from may to august 2023, at a set of 12 regional health directors, 82 provincial delegation of health and 10 Higher Institutes of Nursing and Health Techniques with regional and provincial managers involved in the process of setting up regional distance continuing education centers.

2.1 Inclusion criteria:

This study includes regional and provincial managers involved in the process of setting up regional distance continuing education centers who have expressed informed consent to participate in the survey.

2.2 Exclusion Criteria:

regional and provincial managers involved in the process of setting up regional distance continuing education centers:

• Refusing to participate in the study;

• Having participated in the test of the questionnaire used for field data collection;

• Did not complete the questionnaire.

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2.3 Data collection:

Our survey questionnaire was designed in the form of a Likert-scale questionnaire (DAYANG NANA, 2019) to ascertain the perceptions of managers and stakeholders in theprocess of setting up e-learning centers at the regional level. This questionnaire covers 5 dimensions relating to the determinants of the implementation of e-learning continue learning centers, namely:

• The value and importance of the e-learning continue learning centers;

• The commitment and leadership ;

• The availability of resources: technology and platform;

• The pedagogical means and interactivity;

• The assessment and certification.

Pre-tests of the questionnaire were carried out in the two regional health departments, the Tangier-Tetouan-Al Hoceima region and the Béni Mellal-Khénifra region.

2.4 Ethical considerations

Informed consent was obtained from each individual at the time of study entry. Participation in the study was free of charge, respecting confidentiality and anonymity.

2.5 Some definitions

2.5.1 Higher Institutes of Nursing and Health Techniques (HINHT)

The Higher Institutes of Nursing and Health Techniques are higher education institutes that do not belong to universities, they are under the supervision of the Ministry of Health, and they specialize in training in nursing and health techniques.

2.5.2 The e-learning Continue learning centers

By e-learning continue learning centers this work means the existence of premises and equipment necessary for the organization of e-learning continue learning at the regional level.

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2.6 Statistical analysis

The collected data were coded and subjected to computerized analysis using (SPSS V20 software). The variables were expressed as percentages.

3.RESULTS:

3-1Characteristics of the study's target population:

In this study, 56.25% of the regional and provincial managers surveyed were women and 43.75% were men. 45.31% stated an age between 40 and 50 years, and 30.47% stated an age over 50 years. Their length of service with the Ministry of Health was between 16 and 20 years in 36.72%, over 21 years in 24.22%, between 11 and 15 years in 17.19% and between 6 and 10 years in 14.84%. Their length of service was over 10 years in 52.34%, and between 5 and 10 years in 30.06%. (Table 1)

Table 1: Characteristics of the study's target population

	Total respondents N=128	
	Effectif	**Percentage**
Gender		
Female	72	56,25
Male	56	43,75
Age		
[20-29 years]	11	8,59
[30-39 years]	20	15,63
[40-50 years]	58	45,31
>50 years]	39	30,47
Seniority at the Ministry of Health		
< 1 year	2	1,56
[1 an- 5 years]	7	5,47
[6-10 years]	19	14,84
[11-15 years]	22	17,19
[16-20 years]	47	36,72
>21 years	31	24,22
Years of service		
< 5 years	11	8,59
[5-10 years]	50	30,06
>10 years	67	52,34

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3-2 Dimension: The interest and importance of setting up distance continuing education centers (CFCAD)

The vast majority of respondents (75% + 15% = 90%) have a positive interest in the organization. In addition, the results show that the majority of respondents (70% + 20% = 90%) perceive a positive interest on the part of healthcare professionals in setting up CFCADs. Most respondents (80% + 10% = 90%) recognize the training offer as a valuable alternative. A significant majority (68% + 20% = 88%) believe that distance learning can improve the skills of healthcare professionals. The vast majority of respondents (85% + 10% = 95%) believe that distance learning is resilient and continues to be offered even in times of crisis. (Graph n°1)

Graph 1: The interest and importance of setting up distance continuing education centers (DCEC)
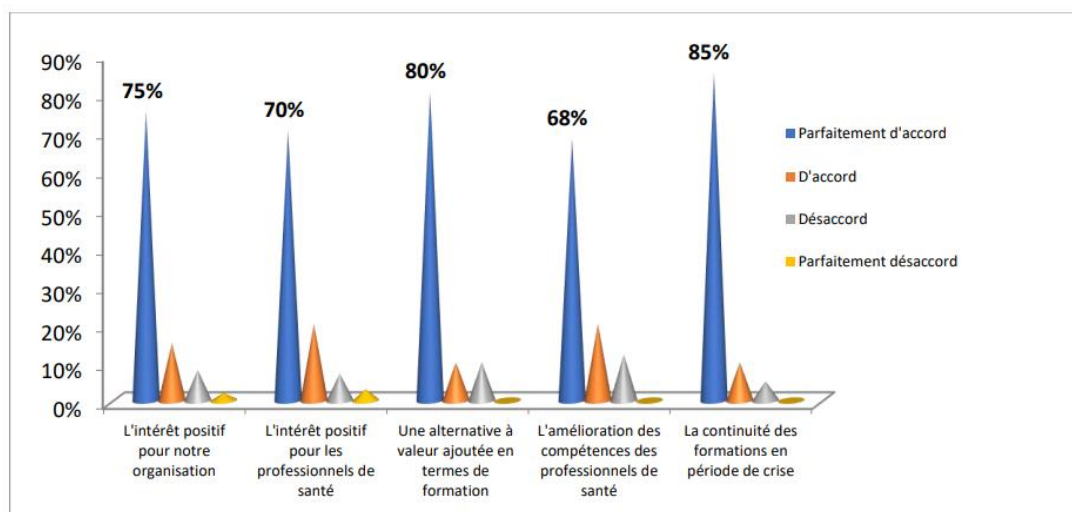
3-2 Dimension: Commitment and leadership

The results indicate a favorable commitment to distance continuing education on the part of decision-makers and managers, with a majority (70% + 20% = 90%) agreeing or strongly agreeing. The majority of respondents (60% + 20% = 80%) perceive a certain level of leadership about the department's strategic orientations. The vast majority of respondents (80% + 10% = 90%) recognize the value of the continuing education strategy. A relatively balanced distribution, with 50% agreeing or strongly agreeing on the achievement of objectives, but also 20% expressing disagreement. The responses show that although 60% agree on the steering and sound management of CFCAD, a significant percentage (20% + 5% = 25%) express partial or complete disagreement. (Graph n°2)

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Graph 2: Commitment and leadership
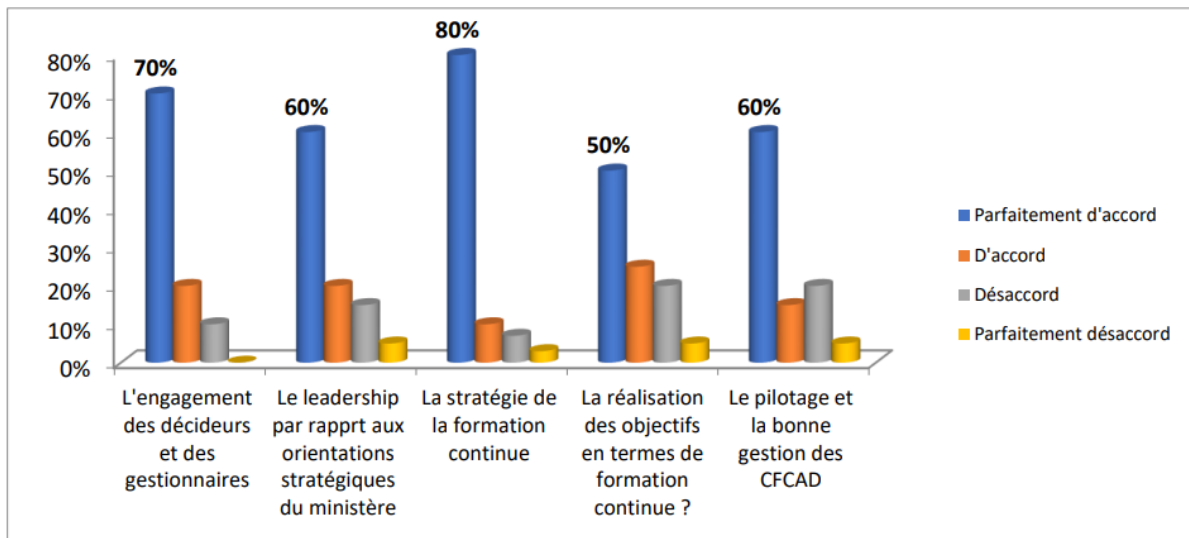
3-3 Resource availability: Technology and platform

The results show strong approval (90% + 10% = 100%) of the suitability and performance of the technology used. This indicates that the majority of respondents consider that the implementation of adapted technology meets their needs and performs satisfactorily. In addition, the responses indicate a high level of approval (95% + 5% = 100%) for the training of trainers in the use of technology. This suggests that trainers need to be well prepared to effectively integrate technology into their teaching practices. The majority of respondents (80% + 20% = 100%) consider the platform to be effective and reliable. This indicates that the availability of effective and reliable technology for training is generally well-perceived in terms of performance and reliability. The majority of respondents (85% + 15% = 100%) recognize that an adequate commitment in terms of resources and material means to support the use of technology is essential when setting up distance- continuing education centers. 95% of respondents recognize the importance of regular maintenance and upkeep of technology. (Graph n°3)

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Graph 3: Resource availability: Technology and platform
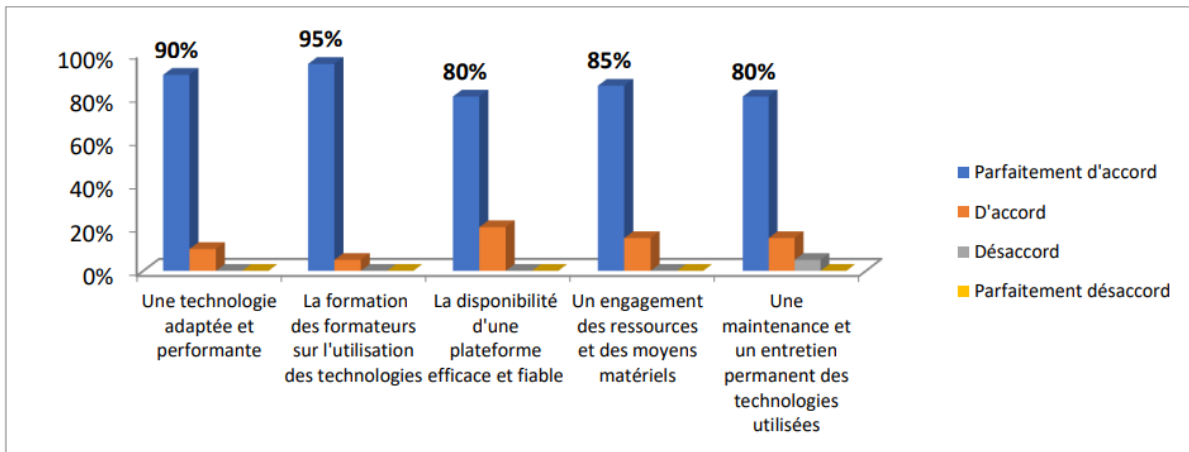
3-4 Teaching aids and interactivity

The results show that the majority of respondents (52% + 43% = 95%) consider assimilation and comprehension to be positive aspects of distance learning. 82% perceive the effectiveness of communication as positive. 82% believe that distance learning interactions are as effective as face-to-face interactions. 39% agree or strongly agree that distance learning is as effective and relevant as face-to-face training. The responses show strong approval (73% + 15% = 88%) of the availability and accessibility of online training materials. This indicates that the majority of respondents find the training materials accessible and available according to their needs. (Graph 4)

Graph 4: Teaching aids and interactivity

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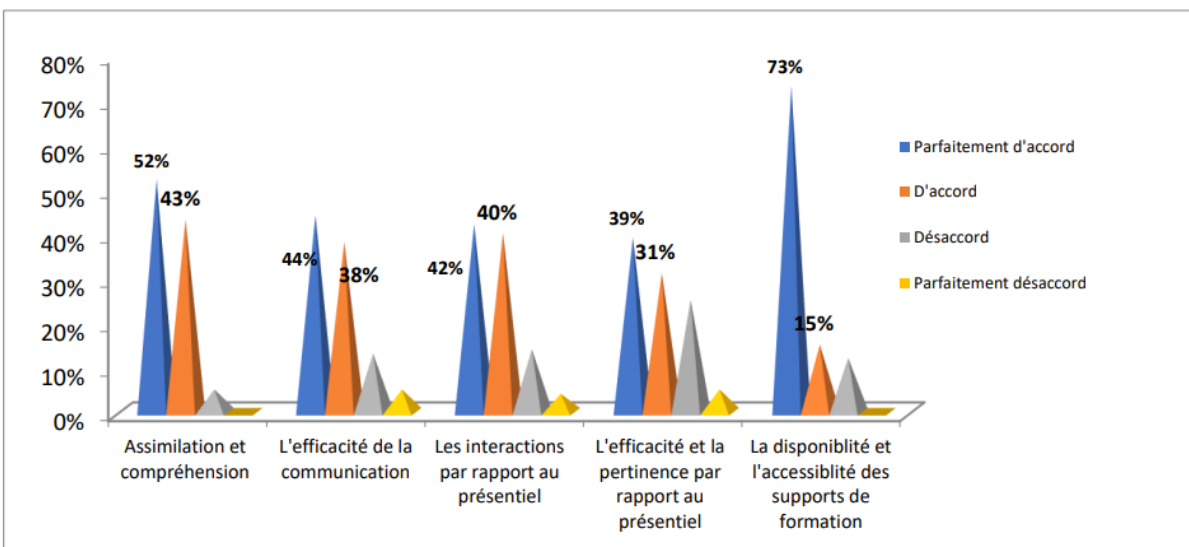
3-5 Assessment and certification

The results show strong approval (85% + 15% = 100%) of the pedagogical quality and improvement of distance teaching and learning methods. 98% of respondents consider that trainers are qualified. 97% consider that distance learning complies with mandatory standards and regulations. 95% agreed that distance learning centers need monitoring and evaluation mechanisms. 60% agreed or strongly agreed with the commitment to continuous improvement in training quality. (Graph n°5)

Graph 5: Assessment and certification
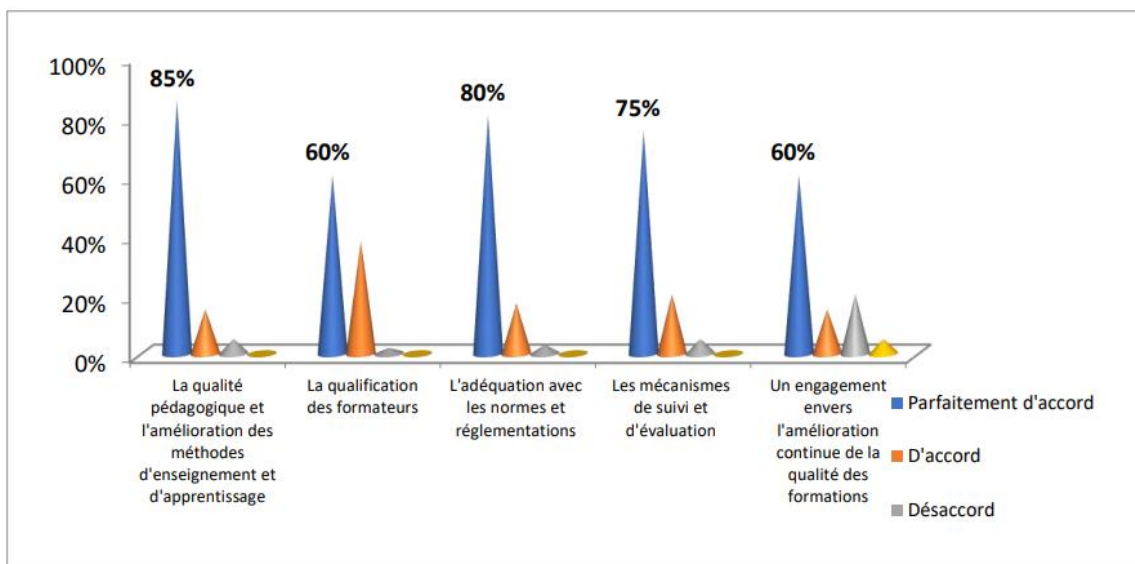
4.DISCUSSION:

Following the example of the findings on the key determinants favoring and/or hindering the implementation of distance continuing education centers at regional level, we can say that this is a very important project, that will be of major interest in terms of improving the skills and knowledge of healthcare professionals, and could help to highlight the continuing education strategy of the Ministry of Health and Social Protection.

A full 90% of participants declared the importance and interest of CFCAD for our organization and healthcare professionals. In this context, promoting new training methods that give participants a place, their responsibility and their initiative, appears to be an essential challenge for open training and new training technologies [8]. One of the key factors

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in setting up distance learning centers is satisfying the expectations and needs of both the administration and healthcare professionals [9].

Distance learning at training centers is characterized by the quality of leadership, by the level of commitment of managers, by the strategy and objectives set out by leaders to stand out and distinguish themselves, because this type of learning has developed rapidly in terms of its forms, techniques, strategies, means and new professions, as developed by Deschênes and Coumaré in their articles on the characteristics of distance learning [10-11].

Furthermore, distance learning is based on the integration of information and communication technologies, adaptation to the individual, and modularity of training. In our study, 88% of respondents stated that the means and resources deployed in distance learning play a very important role in the assimilation and understanding of distance courses. A distance learning system is a set of actors (learners, tutors, training managers) and technical tools (teaching resources, exchange tools, platforms) organized in space and time, according to a learning goal" [12], it is a recognized system finalized and organized by the actors themselves, which takes into account the particularity and singularity of people in all dimensions, both individual and collective, and which is based on the context and situation of training and learning in terms of place and time, human and technological pedagogical tools, and resources.

The acquisition of knowledge is conditioned by the active participation of the apparent/participant, and the latter is at the heart of his or her appropriate learning, individually and collectively constructed and reconstructed, his or her practical knowledge enabling him or her to solve problems or carry out projects [13].

Evaluation and certification of distance learning centers are essential to guarantee the quality of teaching and the credibility of the programs offered. Meeting the required standards allows for diverse teaching activities that do not require sophisticated technological tools, particularly software, on the training participants' workstations [14].

The need to monitor and evaluate distance learning centers enables them to comply with standards to ensure the quality of training, pedagogical content, teaching methods, accessibility, interaction between learners and trainers, as well as the resources made available, and consequently the satisfaction of the expectations and needs of applicants and organizations [15].

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5. CONCLUSION:

In an ever-changing world, distance learning is emerging as an innovative alternative for delivering up-to-date, relevant medical knowledge to a diverse audience of healthcare practitioners. By combining technological advances with the need for continuing education, distance learning in healthcare is emerging as an essential pillar of modern medical training. Indeed, distance continuing healthcare education offers invaluable flexibility for learners, enabling them to follow courses at their own pace, whatever their place of work or time constraints. This flexibility is of crucial importance in the medical field, where healthcare professionals are often faced with busy schedules and high service demands [1]. However, the introduction of distance continuing education centers at the regional level offers an exciting insight into the opportunities and challenges inherent in using e-learning methods to train healthcare professionals.

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Conflicts of Interest

None.

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