CONTRIBUTION TO CONTINUING TRAINING ON INTEGRATING AND USING COMPUTER-ASSISTED INSTRUCTION

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Abstract- The Moroccan education system is currently undergoing a series of reforms aimed at integrating computer-assisted instruction (CAI) as a complementary teaching tool. This study looks at the extent to which the contribution of in-service training has a direct impact on the integration and use of computer-assisted teaching. The study focuses on physics-chemistry teachers at the qualifying secondary level in the Rabat Sale Kenitra region. The results show that 68% are between 30 and 50 years old, and 44% have been in a job between 10 and over 15 years. However, 37.5% have had further training. The chi_2 test shows a significant relationship between the acquisition of continuing education and the factors of gender ($p<0.05$); financial level ($p<0.05$) and duration of training ($p<0.03$). On the other hand, 7 teachers said they had improved their competence, 6 had improved their practice and 5 had improved their knowledge. In light of these results, decision-makers need to encourage secondary school teachers to participate massively in in-service training workshops, making it easier for them to do so (finance; time adjustment, motivation).

Keywords: Teacher, Continuing Education, CAI, Competence, High School.

1. INTRODUCTION

The whole world has been accelerating the pace of technological development in education systems. In-service training is seen as one of the strong pillars of the GENIE program. It aimed to enrich the skills and competencies of teachers in their teaching practices. And so, to train them in the use and integration of TICE in their effective teaching practices to improve student learning [1, 2]. The identification of five crucial elements to consider in the correlation between technology utilization and student achievements includes training, surrounding circumstances, personal attributes, the significance of a supportive community and human connections, and the time commitment. Similarly, multiple factors might account for the gradual integration of ICTE in educational settings: insufficient software expertise, inadequate initial and ongoing training in using technology for teaching, and a scarcity of institutional resources.

Nonetheless, Morocco has embraced fresh approaches like computer-assisted instruction (CAI) to enhance educational quality. Nonetheless, there is a universal demand for nations to expand, ease, and enhance the value and caliber of their education systems across all tiers [3]. Nevertheless, based on our initial observations and the indirect interviews we managed to conduct, the implementation of these measures is progressing at a notably sluggish pace. The utilization of Information and Communication Technology (ICT) within Moroccan schools remains considerably restricted, if not entirely absent. This underscores the significance of investigating this situation, which led us to believe that utilizing this study to contemplate the diverse applications of ICTs within the Moroccan education system is exceptionally timely. Moreover, it is essential to analyze the barriers obstructing these applications. Numerous studies have previously been carried out with the intention of identifying and categorizing these hindrances.

A case in point is the report published in (2004) by the British Educational Communications and Technology Agency (BECTA) [4]. Creating an extensive analysis of existing literature regarding impediments to incorporating ICT into education suggests two primary groupings: the initial one pertains to hindrances linked to individuals (barriers at the teacher level), encompassing factors like time constraints, limited self-assurance, and reluctance towards change. The subsequent grouping involves challenges associated with institutions (obstacles at the school level), such as insufficiently impactful training opportunities and inadequate resource availability. Similarly, he emphasized two primary sets of obstacles [5]. The initial set comprises extrinsic first-order barriers, encompassing issues of entry, time, assistance, resources, and education. The subsequent set includes intrinsic barriers, labeled as second-order hurdles, exemplified by teachers' outlooks, convictions, methods, and opposition. Our effort involves enhancing the understanding of the direct and indirect impact of ongoing computer-assisted instruction (CAI) training on educators' expertise. Simultaneously, we aim to pinpoint the hindrances impeding its implementation.

2. METHODOLOGY

2.1. The Population of the Study

Our horizontal random survey concerns qualifying secondary school physics chemistry teachers (N=48) belonging to the delegations of the Rabat Sale Kenitra regional public education and training academy (during April and May 2022).

2.2. Development of the Questionnaire

Data were collected based on a questionnaire structured along two axes:
Axis 1: socio-demographic and professional characteristics.
Axis 2: continuing education with 6 items, Table 1.

Table 1. The survey items

Item	Label
1	the training's coverage
2	training is too costly
3	employer support
4	My professional schedule prevents me from participating in continuing education activities.
5	family responsibilities
6	There is no reason to participate in these activities

2.3. Statistical Analyses

The collected data were transferred to SPSS (trial version) after filtration and coding were transferred to Excel. The percentages used to express the results of the qualitative variables were as follows. Joint analyses, such as ACM (Multiple Correspondence Analysis), were performed at a 5% error (chi_2 independent test).

3. RESULTS

3.1. Socio-Demographic and Professional Characteristics

The distribution of surveyed teachers by age, gender, and number of years in post and province in Table 2.

Table 2. Socio-demographic and professional characteristics of teachers

Variable	Modality	Ni	%
Age	under 30	2	4%
	30 to 40 years	16	33%
	40 to 50 years old	17	35%
	Over 50	13	27%
Gender	Men	35	73%
	Woman	13	27%
Seniority	less than 5 years	1	2%
	5 to 10 years	9	19%
	10 to 15 years	17	35%
	More than 15 years	21	44%
Province	Kenitra	23	48%
	Rabat	8	17%
	Sale	5	10%
	Temara	3	6%
	Sidi Slimane	3	6%
	Sidi Kassem	2	4%
	Khemeisat	4	8%
Last university degree	License	22	46%
	Master	18	38%
	Doctorate	8	17%
Subject taught	Chemistry	15	31.3%
	Physics	33	68.8%

Indeed, 68% are aged between 30 and 50, and 73% are female. However, 54% of teachers have been on the job between 5 and 15 years. 46% have a bachelor's degree and 38% have a master's degree. Furthermore, 68.8% have a physics specialization, and 31.3% have a chemistry specialization.

3.2. Relationship between Continuing Education and the Professional Characteristics of the Sample

The results of the breakdown of respondents by continuing education shows in Table 3. Indeed, 37.5% (n=18) of the respondents replied that they had received ongoing training in OCT (11 teach physics and 7 teach chemistry). Of these, 83.33% had had this training for a few days (khi_2=7.04; p<0.03), and 16.7% had had it for a month or more. khi_2 Test of Independence shows a significant link between the diploma obtained and the training (p<0.05), of which 31.82% had a bachelor's degree. The 8 teachers said that this training was partial, 3 cases answered insufficient and only one confirmed that it was complete. Regarding the impact of this ongoing training in CAT, 7 teachers improved their skills, 6 others their practice, and 5 teachers improved their knowledge.

Table 3. Results of the distribution of respondents having had continuing education according to certain variables

Variable	Modality	CT	Total	%	Significance chi_2
Degree	Bac+ 3	7	22	31.82	P<0.71(ns)
	Bac + (> 3)	11	26	42.31	
Gender	Female	2	13	15.38	p<0.05*
	Male	16	35	45.71	
Financial level	Low	1	1	-	P<0.05*
	Medium	14	43	32.56	
	Comfortable	3	4	75	
Length of training	A few days	15	15	--	P<0.03*
	One month or more	5	5	--	
Improvement	Knowledge	5	8	62.5	0.63 (ns)
	Practical	6	13	46.15	
	Skills	7	11	63.64	

CT: number of teachers who have had in-service training; *: significant difference at 5%

3.3. The link between Continuing Education and Questionnaire Items

This scale composed of 6 items Table 4 is highly reliable (Cronbach's alpha = 0.79), with an average inertia of 48.9%. Analysis of the results for the first item (responsibility for this training) revealed that 78.13% of the teachers who responded said that their school had taken charge of their in-service training, and 21.87% by their means (khi_2=9.79; p<0.002). However, 72.22% of teachers felt that this CE was not at all expensive, compared with 27.77% who agreed that this CE was expensive about their financial level.

Concerning the question "The reasons that prevent you from taking part in in-service training", over 33.33% answered that their professional schedule was not suitable, over 44.44% said that this was due to family responsibilities, and over 44% said that they had no 'incentive' to take part in these activities.

Table 4. Chi-square test between items and continuing education

Variable	Modality	Teacher with CT (n=18)	khi_2	Significance
the cost of this ongoing training	On your own	7	9.79	$P<0.002*$
	Establishment	11		
training is too expensive	Strongly disagree	13	3.97	$P<0.26$ (ns)
	Strongly agree	5		
employer support	No	13	1.93	$P<0.58$(ns)
	Yes	5		
My work schedule does not allow me to participate in continuing education activities	Strongly disagree	12	2.98	0.39 (ns)
	Strongly agree	6		
family responsibilities	Strongly disagree	10	1.64	0.65 (ns)
	Strongly agree	8		
no incentive to participate in these activities	Strongly disagree	10	9.28	0.026*
	Strongly agree	8		

3.4. Global Analysis Using MCA

A global analysis using MCA (multiple correspondence analysis) revealed three distinct groups Figure 1:

• The first group is instituted by two variables employer support and no incentive they are correlated with each other, and they are more significant.

• The second group is formed by three variables familiar responsibility, professional time and continuous training have too onerous that they are moving away from the center are more significant, and the angle between each variable is reserved the more significant the correlation is. So, we can see that this group forms a cluster of three highly correlated variables.

• The third group is made up of a single price variable, which is closer to the center and doesn't play a fundamental role, even if it remains relatively correlated with the two groups.
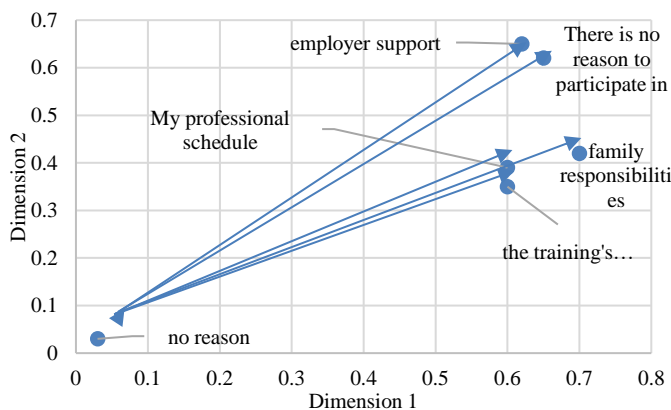

Figure 1. Presentation of item discrimination measures in ACM

4. DISCUSSION

The advancement of technology necessitates an expansion and heightened focus on teacher training for effectively incorporating TICE. Keeping this in consideration, in the context of Morocco [6]. In Morocco, the implementation of the E-taken platform in June 2022 through the framework law 51-17, known as "project 9 and project 12," provides a tangible manifestation of efforts aimed at enhancing the professional skills of Moroccan educators. The existing challenges within the realm of initial teacher training in the country pose a potential obstacle to the growth of this aspect, particularly for new teachers. As a result, there arises a necessity to reevaluate the initial training process, focusing on the factors that foster the cultivation of reflective practice within a well-structured and productive framework [7].

According to [8] the study, which aims to equip future teachers with skills in the design, implementation and evaluation of socio-political action-oriented activities, and to understand the impact of the educational experience on future teachers. Our undertaken efforts within the Kenitra Rabat Sale region have been geared towards enhancing the role of ongoing education in advancing computer-assisted instruction. In accordance with [9] The objective of continuous training is to impartially evaluate the impacts and modifications that a training initiative can yield. Additionally, the integration of Information and Communication Technologies (ICTs) enhances the efficiency of learning, thereby providing avenues for both technical and pedagogical innovation [10].

However, 37.5% (n=18) of the respondents in our sample replied that they had ongoing training in CAT. Contrary to what was said by [11]. In Korea, over 30% of teachers are targeted to undergo ICT training at some point during their teaching career. In contrast, China promotes extensive participation of teachers in large-scale ICT training initiatives through encouragement from school administrators [12]. However, according to, the report from [13]. The evaluation of teachers in Morocco is not yet aligned with standards, despite 77.7% of surveyed teachers possessing personal computers. However, a mere 14% of them incorporate ICTs into their teaching. The efforts undertaken by teachers [14]. A study carried out in 2018 in the Provincial Directorate of Agadir focused on the management and use of ICT in language teaching for secondary school teachers, at a rate of 1 to 3 hours per week, using computers, video projectors or interactive whiteboards. Studies looking at the contribution of ICT to the teaching/learning process have highlighted the vital role of self-training and institutional provision in terms of continuing education and professional training [15].

In 2018, a research project was conducted at the Provincial Directorate of Agadir, centering on the utilization and control of Information and Communication Technology (ICT) in the instruction of language for high school educators. This involved a weekly commitment of 1 to 3 hours, employing tools such as computers, video projectors, and interactive whiteboards. Investigations exploring the impact of ICT on the teaching and learning journey have underscored the crucial significance of self-guided learning and institutional support in the realm of ongoing education and professional development [16]. At the same time, several obstacles have been described as factors holding back the integration of ICT, such as 1/ not having an accepted level of ICT, 2/ not being able to handle computer simulators, 3/ the lack of scientific equipment, 4/ the lack of monitoring and evaluation [17].

Furthermore, the lack of time is identified as an obstacle to the integration of ICTs in classrooms to cover the program, especially in rural areas [18]. Based on the information provided earlier, our findings align with the conclusions drawn by other researchers who have previously deliberated on the connection between Information and Communication Technology (ICT) and the enhancement of teachers' competencies. Moreover, prior studies have indicated that undergoing training while on the job holds potential as a reliable indicator of teachers' proficiency in handling information [19].

Research indicates that the influence of teacher training programs on the effective incorporation of ICT into teaching methods surpasses that of field experience or psychological factors, as demonstrated by various studies [19, 20]. Faced with the growing demand for these IT methods (ICTE), researchers in these fields have tried to integrate new IT communication systems such as management systems (LMS): WebCT, Blackboard, and Moodle have been popular and successfully used in online education systems [22].

In addition to the practical applicability of the e-learning model, it's important to address the computer skills of physical science educators, often at a novice level. Effectively addressing this technological and pedagogical gap regarding the incorporation of Information and Communication Technology (ICT) into their teaching methods is a crucial remedial measure. The designed training program aims to equip these teachers with a minimum proficient level of ICT skills. Importantly, such training requires ongoing monitoring and rigorous assessment to ensure its effectiveness [23].

5. CONCLUSION

The ongoing transformation of educational systems underscores the necessity of embracing a paradigm of lifelong learning, meticulously tailored to cater to the ever-evolving needs of educators. This research endeavor seeks to delve deeper into our comprehension of the nuanced relationship between Computer-Assisted Instruction (CAI) and the cultivation of proficient skills, situated within the realm of continuous teacher training. Aligned with the directives laid out by the Moroccan government, the infusion of innovative professional methodologies seamlessly intertwines with comprehensive teacher development programs, intricately designed to resonate with the distinctive requirements of each individual. These proactive initiatives are further bolstered by a comprehensive array of dedicated support mechanisms, thereby ensuring educators receive precisely customized guidance and assistance.

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