

# MOROCCAN UNIVERSITY PROFESSORS' ATTITUDES TOWARDS THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING

By

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## **Abstract:**

This study examined Moroccan university professors' attitudes towards integrating information and communication technology in teaching. The data was collected through a questionnaire based on the Computer Attitude Scale Questionnaire (CASQ), hand out to 155 Moroccan university professors, operating in 9 academic institutions, belonging to 3 public universities in Morocco. The purpose of this study is to learn about the respondents' attitudes towards using technology in teaching, to examine some factors influencing the integration of ICT in teaching and to find out whether there is a correlation between Moroccan university professors' attitudes towards ICT and their level of technology integration in teaching.

The findings reveal that Moroccan university professors have positive attitudes toward ICT in teaching. There is no relationship between age and the respondents' attitudes. There is almost no difference between the two genders. As for the teaching experience variable, there is almost no difference between the different groups. The findings also reveal that there is a positive relationship between the respondents' attitudes and their level of technology integration.

**Key words:** Attitudes, Information and Communication Technology (ICT), ICT integration, Attitude and Intention Behavior (AIB).

**Résumé:**

Cette étude a examiné les attitudes des enseignants universitaires marocains envers l'intégration des technologies de l'information et de la communication dans l'enseignement. Les données ont été collectées à travers un questionnaire basé sur le Computer Attitude Scale Questionnaire (CASQ), distribué à 155 enseignants chercheurs, exerçants dans 9 établissements académiques, appartenant à 3 universités publiques au Maroc. Le but de cette étude est de connaître les attitudes des enseignants à l'égard de l'utilisation de la technologie dans l'enseignement, d'examiner certains facteurs influençant l'intégration des TIC dans l'enseignement et de savoir s'il existe une corrélation entre les attitudes des enseignants universitaires marocains à l'égard des TIC et leur niveau d' l'intégration des technologies dans l'enseignement.

Les résultats ont révélé que les professeurs universitaires marocains ont des attitudes positives envers les TIC dans l'enseignement. Il n'existe aucune relation entre l'âge et les attitudes des enseignants. Il n'y a presque pas de différence entre les hommes et les femmes. Quant à la variable expérience professionnelle, il n'y a presque pas de différence entre les différents groupes. Les résultats ont également révélé qu'il existe une relation positive entre les attitudes des enseignants et leur niveau d'intégration des TIC.

**Mots clés:**

Attitudes, Technologie de l'Information et de la Communication (TIC), Intégration des TIC, Attitude et Comportement d'Intention.

## 1. INTRODUCTION

An attitude may be defined as a positive or negative emotion towards a particular objects or behavior (Ajzen & Fishbein, 1980). According to Ajzen and Fishbein an individual's attitude toward an object is composed of two basic elements: a view that objects could lead to a particular consequence and an assessment of the outcome of that using that object.

Attitudes are generally defined as consisting of three attitudinal components. These are affective, behavioral and cognitive components. The effective components refer to feelings towards a social object. The behavioral components refer to specific actions towards a social object and the cognitive component refers to beliefs about a social object. (Burns, 1997).

Example from the Attitude Computer Scale (CAS) questionnaire given by (Jones & Clark, 1994, p. 317) includes:

- Affective: "Working with a computer makes me feel tense and uncomfortable."
- Behavioral: "I learn new computer tasks by trial and error."
- Cognitive "Computers are difficult to understand."

A great number of studies have revealed that teachers' attitudes towards ICT are major factors related to both the initial acceptance of information and communication technology.

## 2. LITERATURE REVIEW

### 2.1. Professors' attitudes towards integrating ICT in teaching

Among the factors that may influence the use of ICT into teaching are teachers' attitudes towards technology. If teachers' attitudes are positive toward the use of educational technology, then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes.

Demirci (2009) conducted a study on teachers' attitudes towards the use of Geographic Information Systems (GIS) in Turkey. The study revealed that though barriers such as lack of hardware and software existed, teachers positive attitudes towards GIS was an important determinant to the successful integration of GIS into Geography lessons.

In a study about attitudes which influence the innovative use of ICT by teacher educators in the Netherlands was carried out by Drent & Meelissen (2007). A sample of 210 teachers was used for the study. Their findings revealed that student-oriented pedagogical approach; positive attitudes towards computers, computer experience, and personal entrepreneurship of the teacher educator have a direct positive influence on the innovative use of ICT by the

teacher. Also, comparison between these factors in predicting computer use identified that attitudes towards computers contributed more in explaining ICT use by teachers. In addition, educational theorists and researchers have realized that an important factor in the implementation of computers is users' acceptance, which is in turn influenced by their attitudes towards these media (Koohang, 1989). Teachers' attitudes have been found to be major predictors of the use of new technologies in instructional settings (Almusalam, 2001). The successful use of technology in the classroom depends to a large extent on the teachers' attitudes toward these tools (Lawton & Gerschner, 1982). In another study, Teo (2008) conducted a survey on pre-service teachers' attitudes towards computer use in Singapore. A sample of 139 pre-service teachers was assessed for their computer attitudes using questionnaire with four factors: affect (liking), perceived usefulness, perceived control, and behavioural intention to use the computer. He found that teachers were more positive about their attitudes towards computers and intention to use computer than their perceptions of the usefulness of the computer and their control of the computer.

In fact, it has been suggested that attitudes towards computers affect teachers' use of computers in the classroom and the likelihood of their benefiting from training (Kluever, Lam, Hoffman, Green & Swearingen, 1994). Positive attitudes often encourage less technologically skilled teachers to learn the skills necessary for the implementation of technology-based activities in the classroom. Harrison and Rainer (1992) found that participants with negative computer attitudes were less skilled in computer use and were therefore less likely to accept and adapt to technology than those with positive attitudes. They concluded that changing individuals' negative attitudes is essential for increasing their computer skills. Therefore, if teachers want to successfully use technology in their classes, they need to possess positive attitudes to use technology. Such attitude is developed when teachers are sufficiently comfortable with technology and are knowledgeable on its use. Research has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching, (Huang & Liaw, 2005).

In European School Net (2010) survey on teachers' use of Acer net books involving six European Union countries, a large number of participants believed that the use of net book had had a positive impact on their learning, promoted individualized learning and helped to lengthen study beyond school day. However, evidence suggests that small number of

teachers believe that the benefits of ICT are not clearly seen. The empirical survey revealed that a fifth of European teachers believed that the use of ICT in teaching did not benefit their students' learning, Korte & Hüsing, (2007). A survey of UK teachers also revealed that teachers' positive attitudes about the possible contributions of ICT was moderated as they became rather more ambivalent and sometimes doubtful' about specific, current advantages, (Becta, 2008).

Teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely they will show positive attitudes towards computers. (Rozell & Gardener, 1999). Positive computer attitudes are expected to foster computer integration in the classroom, (Van Braak, Tondeur & Valcke, 2004).

Teachers' attitudes towards computers are recognised as a necessary condition for effective use of computers in the classroom (Woodrow, 1992). He also asserts that any successful transformation in educational practice requires the development of positive user attitude towards new technology. It has been shown that a positive computer attitude is a necessary prerequisite and an integral part of computer literacy (Woodrow, 1991). As for Watson, (1998), the development of teachers' positive attitudes towards ICT is very significant factor not only for increasing computer integration but also for avoiding teachers' resistance to ICT. The perceived usefulness of computers can influence attitudes toward computers, and the amount of confidence a teacher possesses in using computers may influence his or her implementation in the classroom (Gressard & Loyd, 1985).

The lack of knowledge and experience in the computing area is one of the most common teacher's negative attitudes towards the integration of the ICT. Furthermore, computer anxiety is identified as a major cause of resistance to using computers. It has been found that increased computer experience reduces computer knowledge among many teachers. (Gardener et al., 1993). Nevertheless, it may depend on the type of duration of computer experience (Mc Inerney et al., 1994); (Beasley & Sutton 1993).

Zhang and Espinoza (1997), found that attitudes towards computer, in particular measures of comfort/ anxiety and perceived usefulness, were significant predictors of the need for learning computing skills, which will in turn affect the computer literacy level. Such findings suggest that in computer training courses, it is important to assess and change the trainee's computer attitudes towards computer (Lawton & Gerschener, 1982). Some teachers are often

resistant to using computers in the classroom, so the development of teacher's positive attitudes towards computers is considered to be a key factor in fostering computer integration and the enhancement of quality learning and teaching using computers (Yuen et al., 1999).

Scolfield and Davidson (1998) showed that a teacher, who is often uncomfortable with technology himself, tends to give more computer access to students who have computers at home. The less technologically capable students, it seems, would require more attention from the teacher. Students who were fortunate enough to have access at home, then, received an additional benefit at school due to the teacher behaviour.

In another study Ertmer (1999) examines first and second order barriers to technology integration in one elementary school. Teachers' beliefs about teaching affected how they perceive and react to first-order barriers. Second order barriers, on the other hand, include factors such as beliefs about teaching, beliefs about computers, established classroom practices, and willingness to change.

Becker and Ravitz (1999) conducted a study that specifically investigated how computer use might influence teacher practice. They found that, given the appropriate environment, the use of computers did in fact seem to produce changes towards more constructivist approaches.

In describing an appropriate environment for change, the authors consider three factors: a school culture supportive of change, an information and social network, and educational resources in sufficient quantity. It is interesting to note that these three items address both first and second order barriers. Additionally, when we consider that change and innovation are social processes Roger (1995) the environment described here is one in which we could expect change to occur.

Another example of how technology use may facilitate changes in teaching practice is provided by Davidson (1999) who found that the use of an educational multi-user object-oriented (MOO) forced them to rethink their role as instructors. While the authors admit to struggling a little with this new role, it is not clear to these researchers if the technology was responsible for creating the change or if there was something about the instructors' beliefs that enabled them to change.

In his study Albirini (2004) has explored the attitudes of high school English as a foreign language (EFL) teacher in Syria towards ICT. The study investigated the relationship between computer attitudes and five independent variables: computer attributes, cultural

perceptions, computer competence, computer access and personal characteristics (including computer training background). The findings suggest that teachers have positive attitudes towards ICT in education. Teachers' attitudes were predicted by computer attributes, cultural perceptions and computer competence. The results point to the importance of teachers' vision of technology itself, their experience with it and the cultural competence that surrounds its introduction into schools in shaping their attitudes towards technology and its subsequent diffusion in their educational practice.

In another study Drent and Meelissen (2007) investigated the factors which stimulate or limit the innovative use of ICT by teachers and educators in the Netherlands. The study concerned 210 teachers who willingly accepted to answer the survey; four of the respondents were also interviewed. The main results of this survey and interviews showed that there are several factors such as the positive ICT attitude, the personal entrepreneurship of the teacher or educator, the student-oriented pedagogical approach and the computer experience have a direct positive influence on the innovative use of ICT by the teacher in the classroom.

According to Koohang (1989), educational theorists and researchers are now conscious that a crucial factor in the implementation of computers is the user's acceptance, which in turn is influenced by his attitudes towards these media.

Teachers' attitudes play an important role in determining the use of technology in teaching. This was clearly demonstrated by a study of secondary school math teachers' reason for not using computers (Norton, Mc Robbie, Cooper, 2000). The study was conducted in a technology-rich private girl school, which allowed the author to virtually eliminate any first barriers that might impede technology use. The researchers found that teachers' belief about teaching and learning explained the lack of computer use in the math teachers' classroom. While the study focused on five math teachers, only three case studies were presented in detail. Of these three two did not use computers in their teaching, while one did.

The most recent studies have shown that the successful implementation of educational technologies depends largely on the attitudes of teachers and educators, who eventually determine how they are used in the classroom. (Bullock, 2004) found that teachers' attitudes are a major factor in the adoption of technology. Similarly, Kersaint, Horton, Stohl, and Garafalo, (2005) found that teachers who have positive attitudes toward ICT feel more comfortable with using it and usually incorporate it into their teaching.



## 2.2. Attitude and Intention Behaviour (AIB)

Attitudes are informed by beliefs needed to engage in the behaviour (Azjen, 1991). It is defined as individual's positive or negative feelings associated with performing a specific behaviour. An individual will hold a favourable attitude toward a given behaviour if he/she believes that the performance of the behaviour will lead to mostly positive outcomes. Several past studies had found significant direct relationship between attitude and internet purchasing (Celik, 2008; George, 2002, Chai and Pavlou, 2004). Celik (2008) found that attitude is significantly related to internet banking intention while Chai and Pavlou (2004) establish that attitude is a significant predictor of electronic commerce intention in two countries, Greece and USA.

## 3. METHODOLOGY

The aim of this work is first, to examine Moroccan university professors' attitudes towards the use of computer technology in teaching. Second, it is to find out whether some of the demographic variables such as age, gender and teaching experience have an influence on their attitudes towards the integration of computer technology in teaching. And then to find out whether there is a correlation between the respondents' attitudes towards ICT and their level of technology integration in teaching.

The data regarding the attitudes was collected from a survey questionnaire, based on the Computer Attitude Scale (CAS).

The total possible score for each subscale ranges from 5 as a minimum score and 20 as a maximum score; and the total possible score for the whole CAS ranges from 20 as a minimum score and 80 as a maximum score.

The participants to this survey were asked to indicate their level of agreement or disagreement on a four- Point-Likert Scale.

4= *Strongly agree*,

3= *Agree*,

2= *Disagree*,

1= *Strongly disagree*.

High scores suggest positive attitudes regarding the integration of computer technology in teaching, while lower scores implies less favourable attitudes. In other words, number 4



suggests highly positive attitudes, 3 indicates positive attitudes, 2 displays negative attitudes and finally 1 refers to highly negative attitudes.

Descriptive statistical analysis of percentages, mean scores, One Way ANOVA and PEARSON Correlation was used to address to analyse the data.

The main purpose of this paper is to examine the attitudes of Moroccan university professors toward computer technology as measured by the Computer Attitude Scale. The four subscales used in this instrument are:

- a- Computer Liking Sub-scale (items 1 to 5),*
- b- Computer Confidence Sub-scale (items 6 to 10),*
- c- Computer Usefulness Sub-scale (items 11 to 15),*
- d- Computer Anxiety Sub-scale (items 16 to 20).*

#### 4. RESULTS DISCUSSION AND INERPRETATION

*Table 1. Frequency percentages on the Computer Attitudes Scale*

<i>Attitudes towards ICTs</i>	<i>SD</i>	<i>D</i>	<i>A</i>	<i>SA</i>
I would like working with computers.	00.0	00.0	18.7	81.3
I think working with computers would be enjoyable and stimulating.	00.0	7.1	31.0	61.1
When I have a problem with a computer that I can't solve, I would stick with it until I have the answer.	1.9	38.1	58.7	1.3
Once I start working with a computer, I would find It hard to stop.	3.9	45.2	49.0	1.9
I do not enjoy talking with others about computers.	1.9	65.8	31.0	1.3
I am sure I could work with computers.	1.9	3.2	56.1	38.7
I am not the type to do well with computers.	40.6	48.4	11.0	00.0

I am sure I could learn a computer language.	5.2	47.7	12.3	34.8
I think using a computer would be very hard to me.	69.7	30.3	00.0	00.0
I have a lot of self-confidence when It comes to working with computers.	1.3	00.0	54.2	44.5
I think using a computer is a waste of time.	98.7	1.3	00.0	00.0
Learning about computers is worthwhile.	00.0	0.6	54.2	45.2
I expect to have little use for computers in my daily life.	27.7	71.6	0.6	00.0
Knowing how to work with computers will increase my job opportunities.	1.3	14.2	26.5	58.1
Working with computers will not be important to me in my life's work.	39.4	60.6	00.0	00.0
Computers do not scare me at all.	1.3	0.6	0.6	97.4
Working with computers will make me very nervous.	99.0	00.0	0.6	00.4
I feel aggressive and hostile towards computers.	98.7	00.0	00.0	1.3
It wouldn't bother me at all to take computer Courses	1.9	20.6	74.8	2.6
Computers make me feel uncomfortable.	96.10	3.90	24.01	23.50

Note/ *SD*= strongly disagree; *D*= Disagree; *A*= Agree; *SA*= Strongly Agree.

The findings regarding the first subscale reveals that all the respondents would like working with computer. In addition to that, (92.1%) of the respondents thinks that working with computers would be enjoyable and stimulating, whereas a minority of respondents 7.1% expressed their disagreement with this statement. In response to the third statement in this subscale, 60% agree that when they have a problem with a computer, they would stick with it until they could solve it. Whereas 40% of the respondents reveal that they would not fix it. Likewise, more than half of the respondents (50.9%) report that they would not find it hard to stop once they start working on computers, whereas 49.1% reported that they would not find it hard to stop once they start working on computers. On the other hand, the majority of the respondents (67.7%) expressed their disagreement with the statement “I do not enjoy talking with others about computers” and only 32.3% stated their disagreement.

As far as the second subscale about computer confidence is concerned, the findings reveal that almost all the respondents (94.80%) express their agreement that they could work with computers and only a minority of respondents (5.2%) could not work with computers. In response to the second statement in this subscale 89% of the respondents express their disagreement that they are not the type to do well with computers. Whereas 11% of the respondents report that they agree with this statement. On the other hand, almost half of the respondents (47.1%) reveal that they could learn about a computer language on the contrary more than half of the respondents (52.9%) express their disagreement with this statement. Moreover, all professors (100%) think that using computer technology wouldn't be hard for them. 98, 7% of the participants indicate that they had a lot of confidence with regards to working on computers while only 1.3 % of the respondents state that they do not trust themselves when working with these new technologies.

Responses to the third subscale concerning computer usefulness, all the respondents strongly disagree with the statement that learning about computers is waste of time. Also almost all respondents 99.4% report that learning about computers is worthwhile. In response to the statement “I expect to have little use for computers in my daily life”, almost all respondents (99.4%) or strongly disagree with this statement. Besides, 84.6% state that knowing how to make use of computers would enlarge their job opportunities. Only 15.4% affirmed that this

knowledge would not increase their knowledge. Similarly all respondents (**100%**) point out that working with computers would be important to them in their work.

Concerning the last subscale dealing with computer anxiety, the findings reveal that the majority of respondents (**98%**) agreed with the statement that computers did not scare them at all, whereas a minority (**2%**) indicates a disagreement with this statement. In response to the statement “working with computers will make me feel nervous”, **99%** expressed their disagreement with the statement, and only **1%** agreed with it. A large proportion of the respondents (**98.7%**) indicated that they did not feel aggressive and hostile toward computer while only **1.3%** state that they did not. In response to the statement “it wouldn’t bother me at all to take computer courses” **77.4%** of the respondents agree with this statement and only **22.6%** express their disagreement. For the last statement in the last subscale, all the respondents or strongly disagree with the statement that computers make them feel uncomfortable.

Since the fifth research question of this study is to measure Moroccan University professors’ attitudes toward the integration of ICT in teaching, and in order to provide a thorough and satisfactory answer to this question, means, medians, modes and standard deviations are used as well. Therefore, and in order to interpret the findings, mean scores above **2.50** suggest positive attitudes toward the use of computer technology in teaching. Mean scores ranging **20.50** to **3.00** indicate low positive attitudes; mean scores ranging from **3.00** to **3.25** imply moderate positive attitudes. Whereas mean scores above **3.25** describe high positive attitudes regarding the integration of ICT in teaching. Table 2 below provides means medians, modes and standard deviation of respondents’ attitudes towards computer technologies.

**Table 2. Mean scores of Moroccan university  
Professors' attitudes toward computer technology**

	<i>N</i>		<i>Mean</i>	<i>Median</i>	<i>Mode</i>	<i>Std. Deviation</i>
	<i>Valid</i>	<i>Missing</i>				
I would like working with computers.	155	0	3.81	4.00	4	.391
I think working with computers would be enjoyable have and stimulating.	155	0	3.55	4.00	4	.626
When I have a problem with a computer that I can't solve, I would stick with it until I have the answer.	154	0	2.60	3.00	3	.554
Once I start working with a computer, I would find It hard to stop.	154	0	2.49	3.00	3	.608
I do not enjoy talking with others about computers.	154	0	2.32	2.00	2	.533
I am sure I could work with computers.	155	0	3.32	3.00	3	.632
I am not the type to do well with computers.	155	0	2.77	2.00	2	.992
I am sure I could learn a computer language.	155	0	1.70	2.00	2	.656
I think using a computer would be very hard to me.	155	0	1.30	1.00	1	.461
I have a lot of self-confidence when It comes to working with computers.	154	0	3.44	3.00	3	.523
I think using a computer is a waste of time.	155	0	1.01	1.00	1	.113
Learning about computers is worthwhile.	155	0	3.45	3.00	3	.511
I expect to have little use for computers in my daily life.	155	0	1.73	2.00	2	.460
Knowing how to work with computers will increase my job opportunities.	155	0	3.41	4.00	4	.780
Working with computers will not be important to me in my life's work.	155	0	1.61	2.00	2	.490
Computers do not scare me at all.	155	0	3.94	4.00	4	.383
Working with computers will make me very nervous.	155	0	1.01	1.00	1	.161
I feel aggressive and hostile towards computers.	155	0	1.04	1.00	1	.341

It wouldn't bother me at all to take computer courses	155	0	2.79	3.00	3	.494
Computers make me feel uncomfortable.	155	0	1.04	1.00	1	.194
Total	155	0	48.31	48.00	51	2.927

The findings in table 2 above reveal that Moroccan university professors have positive attitudes toward the integration of ICTs in their teaching practices with an overall mean score of **48.31** and a standard deviation of **2.92**.

**Table 3. Mean scores of respondents' attitudes towards computer technology.**

**Statistics**

N	Valid	155
	Missing	0
Mean		48.31
Median		48.00
Mode		51
Std. Deviation		2.927
Variance		8.566
Minimum		40
Maximum		56
Percentiles	25	46.00
	50	48.00
	75	51.00

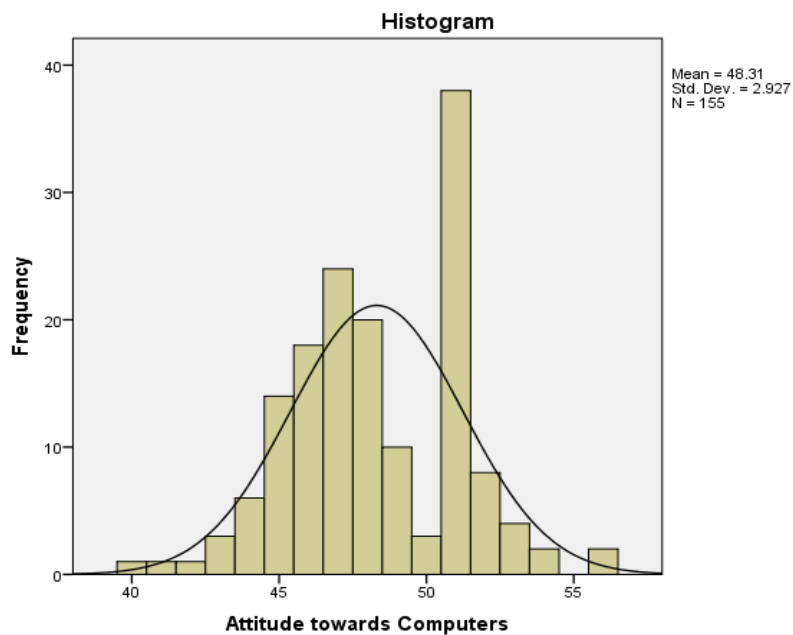
Table 3 above displays the mean scores of the respondents' attitudes towards computer technology. The average score is **48.3**; the majority of the respondents either agrees or disagrees with all the items of the 4 sub-scale of the CAS.

The standard deviation is **2.93**; this indicates that there isn't a big difference between Moroccan university professors' attitudes towards the integration of computer technology in teaching. The maximum score is **56**; this means that it is rare to find someone who strongly agrees with one of the items. Similarly, the minimum score is **40** which signify that it is rare to find a respondent who strongly disagrees with one of the items of the four sub-scales.

Table 4. Respondents' attitudes towards computer technology

	Frequency	Percent	Valid percent	Cumulative percent
40	1	.6	.6	.6
41	1	.6	.6	1.3
42	1	.6	.6	1.9
43	3	1.9	1.9	3.9
44	6	3.9	3.9	7.7
45	14	9.0	9.0	16.8
46	18	11.6	11.6	28.4
47	24	15.5	15.5	43.9
48	20	12.9	12.9	56.8
49	10	6.5	6.5	63.2
50	3	1.9	1.9	65.2
51	38	24.5	24.5	89.7
52	8	5.2	5.2	94.8
53	4	2.6	2.6	97.4
54	2	1.3	1.3	98.7
56	2	1.3	1.3	100.0
Total	155	100.0	100.0	

Figure 1. Histogram showing the attitudes of the respondents



#### 4.1. Factors influencing Moroccan university professors' attitudes

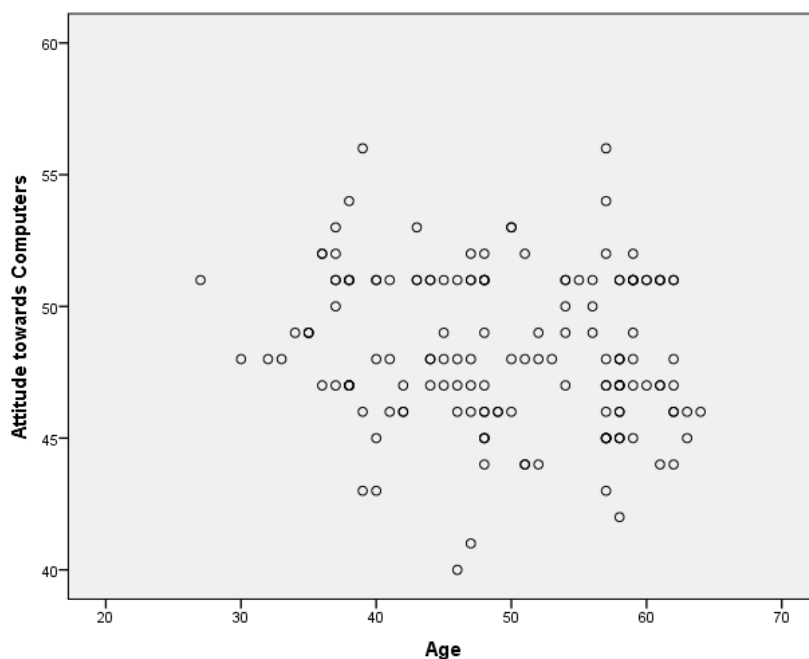


#### 4.1.1 Age variable

First, the age variable was examined to determine whether it affected Moroccan university professors' attitudes toward technology integration in teaching.

To analyze the influence of this factor on the respondents' attitudes, Pearson correlation analysis was used to see if the age factor has an influence on the respondent's attitudes towards computer technology.

**Figure 2. Scatter plot showing the relationship between the age variable and the respondents' attitudes**



The scatter plot above shows that there is no relationship between age and the respondents' attitudes. This finding is confirmed by the correlation which is equal to  $-0.156$ . This correlation is very weak and non significant at the same time.

**Table 5. Correlations between the age variable and respondents' attitudes**

		Attitudes Towards Computers Technology	Age
Attitude Towards Computers	Pearson Correlation	1	-.156
	Sig. (2-tailed)		.053
	N	155	155

<b>Age</b>	Pearson		
	Correlation	-.156	1
	Sig. (2-tailed)	.053	
	N	155	155

#### 4.1.2 Gender variable

The second variable that was examined in relation to the respondents' attitudes was the gender factor. The aim behind this study is to find out whether the gender variable has an influence on the respondents attitudes.

**Table 6. Mean scores of the gender variable and the respondents attitudes**

#### Group Statistics

	<b>Gender</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
<b>Attitude Towards Computers</b>	<b>Female</b>	29	49.00	2.521	.468
	<b>Male</b>	126	48.15	2.999	.267

Table 6 above, reveals that there is almost no difference between males and females since males have scored an average of **48.15** and females have an average of **49**, which means a difference of **0.85**, very weak to be significant (**Sig=0.16**).

#### 4.1.3 Teaching experience variable

Another variable that was examined in relation to the respondents' attitudes is the teaching experience factor. Mean scores and a One-Way ANOVA were used to see whether the teaching experience factor has an impact on the respondents' attitudes towards the integration of computer technology in teaching.

**Table 7. Mean scores of the teaching experience factor and the respondents attitudes**

<b>Teaching experience</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Less than 6</b>	22	48.36	2.172	.463	44	52
<b>6 to 11</b>	25	49.32	3.313	.663	43	56

<i>11 to 16</i>	17	47.65	2.999	.727	40	52
<i>16 to 21</i>	20	48.50	3.000	.671	41	53
<i>21 to 26</i>	34	48.00	3.172	.544	43	56
<i>26 to 30</i>	14	49.64	2.307	.617	46	53
<i>More than 30</i>	23	47.13	2.581	.538	42	51
<i>Total</i>	155	48.31	2.927	.235	40	56

**Table 8. A One-Way ANOVA for the teaching experience factor and the respondents' attitudes towards computer technology**

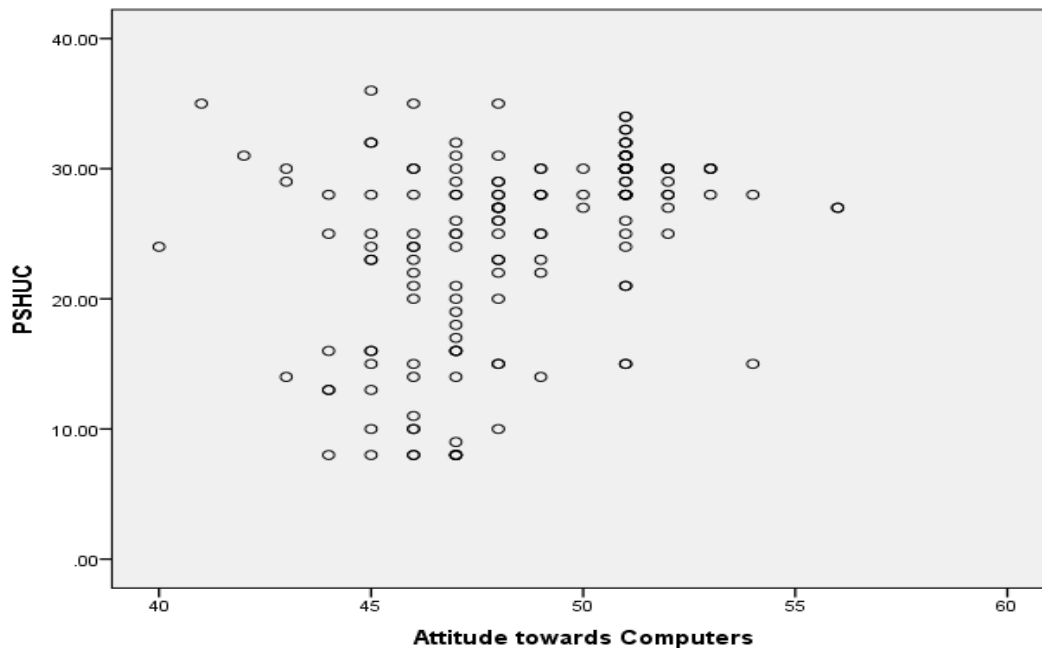
	<i>Sum of Squares</i>	<i>df.</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
<i>Between Groups</i>	93.899	6	15.650	1.890	.086
<i>Within Groups</i>	1225.236	148	8.279		
<i>Total</i>	1319.135	154			

Table 8 above shows that there is no clear difference between the different groups. The group of the most experienced professors have a minimum score of **47.13** for all the items of the CAS. While the group of professors belonging to the **(26-30)** years of teaching experience have scored a maximum of **49.64**, and this is exactly what the One-Way ANOVA Test has confirmed.

#### **4.2. Relationship between the respondents' Attitudes and their Software and Hardware Integration in the Classroom**

In order to find out whether there is a relationship between the respondents' attitudes and their software and hardware integration in the classroom, Pearson's correlation is used to address this question.

**Figure 4. Scatter plot showing the relationship between respondents' attitudes and their software and hardware integration in the classroom**



The Scatter plot above indicates that there is a positive relationship between the respondents' attitudes and their software and hardware integration in the classroom.

This relationship is confirmed by a positive correlation which is equal to **0,37** with a significance level of **0.000**.

This means that the more the respondents' attitudes are positive the more their integration of software and hardware utilities in the classroom is higher and the more their attitudes are negative the more their software and hardware utilities are weaker.

**Table 9. Correlations between respondents' attitudes and their software and hardware integration in the classroom**

		<i>Attitude towards computers technology</i>	<i>PSHIC</i>
<i>Attitude Towards Computers Technology</i>	Pearson	1	.369**
	Correlation		
	Sig. (2-tailed)		
	N	155	155

<b>PSHIC</b>	Pearson		
	Correlation	.369**	1
	Sig. (2-tailed)	.000	
	N	155	155

\*\* . Correlation is significant at the 0.01 level (2-tailed).

#### 4.3. Correlation between respondents' attitudes and the teaching mode of technology integration and (TMTI)

Pearson's correlation is used once again to examine the relation between the respondents' attitudes and their teaching mode of technology integration.

**Table 10. Correlation between respondents attitudes and the teaching modes of technology integration (TMTI)**

<b>Pearson's Correlation</b>		<b>Attitude Towards Computers Technology</b>	<b>TMTI</b>
<b>Attitude Towards Computers</b>	Pearson	1	.252**
	Correlation		
	Sig. (2-tailed)		.002
	N	155	155
<b>TMTI</b>	Pearson	.252**	1
	Correlation		
	Sig. (2-tailed)	.002	
	N	155	155

\*\* . Correlation is significant at the **0.01** level (2-tailed).

As for the relationship between the respondents' attitudes and the TMTI the correlation is less important. The level of the TMTI does not have any relationship with attitudes. The decrease in the correlation is linked to the existence of some professors with unpredictable behavior, i.e. some professors might have some negative attitudes but with a high level of TMTI.

## CONCLUSION

Based on the results from the overall mean scores of the respondents' attitudes, it can be said that Moroccan university professors have positive attitudes towards the integration of computer technology in teaching. The positive attitudes that Moroccan university professors have with

regards to computer technology suggest that the respondents have grasped the significance and importance of integrating ICTs in education. Since computers are playing a considerable role in nearly every aspect of our daily life, it is no wonder that the need to integrate these new technologies in teaching has expanded dramatically.

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