

Analysis Identifying The Particularities of The Adoption of E-Learning Case of The Moroccan Ministry of Education

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Abstract — This paper proposes a scientific study on the introduction of e-learning in a context of In-service training for teachers of the Ministry of National Education in Morocco (MNEM). A conceptual model, based on the Unified Theory of Acceptation and Use of Technology (UTAUT) of Venkatesh (2003) / (2008), has been developed and tested, using a quantitative methodology, with a sample of 211 teachers who master the communication and IT, tools, but they are not active yet in the Ministry of Education online learning system "Collab", (MNEM) used throughout the national territory. The model construction, the evaluation of measurement models and the evaluation of the structural model are carried out on the basis of the graphical interface and validation techniques of the Smart PLS 2.0 software.

The results assure that teachers expecting expected behavior are affected by the intention to adopt the e-learning technology, the social influence and facilitating conditions. However, the variables' effects of the perceived usefulness and perceived ease of use have no influence.

Keywords — Adoption Du E-Learning, Contexte Marocain, Model UTAUT, Equations Structurelles.

I. INTRODUCTION

Information systems research focuses on the interpretation and clarification of the following problem "accepting new technologies based on the user perspective". Many theories have been developed to understand the user's behavior when he faced off a technology.

For ten years the distance learning division Affiliated to the Moroccan national Ministry of education has implemented a training system continues under the name of "Collab", which aims to develop the training of teachers online.

However statistics recorded until the end of September 2015, show a very low enrolment (16.02%), and a very high rate of dropouts (94.83%). These numbers pushed us to think about reasons that hindering the use of e-learning today. However, this article has a double interest. First, on the academic level, it contributes to enhance the knowledge on practices of the introduction of e-learning.

Then, at the managerial level, the main interest is to offer levers of action, improving the chances of successful implementation of e-learning in training.

By this, we formulate answering hypotheses on the research question and develop an explanatory model based on the unified theory of acceptance and use (UTAUT) Venkatesh (2003) / (2008) technology.

An empirical study, conducted among 211 teachers who are not yet active on the device of online learning "Collab"

of the MNEM (not Collabiens) distributed throughout the national territory, enabled us to identify the most significant factors in the acceptance of e-learning. First we present the Unified Theory of Acceptation and Use of Technology (UTAUT) which has been developed to understand the behavior of individuals in the face of a technology. Then we offer our hypothetical model which the foundations are based on the model of UTAUT of Venkatesh (2003/2008). A quantitative study will be conducted in order to validate or refute the hypothesis of our model.

II. LITERATURE REVIEW

Brangier, (2009) states that "Information and communication technologies (ICT) have become more ergonomic, faster and more personalized: They now assist men in their daily tasks and substitute themselves for some of them". In fact, many theories have been developed in order to understand and predict the behavior of individuals in the face of a technology. The most famous are the cognitive theories, and in particular the Unified Theory of Acceptation Using (UTAUT) Technology.

A. Unified Theory of Acceptation and Use of Technology (UTAUT)

Faced with a set of scattered theories, Venkatesh et al. (2003), specify that empirical studies on the adoption of technologies consist often choose a model widely ignoring the contribution of parallel investigations.

In order to meet the dispersion of research on the adoption of technologies, Venkatesh and al. (2003) conducted a synthesis of the main models of individual acceptance of ICTs in order to extract a Unified Theory of Acceptation and Use of Technology (UTAUT).

The latter is then the result of empirical and conceptual similarities between eight models of adoption, namely:

The Technology Acceptance Model (TAM) (Davis 1989, Davis et al 1989).

- The theory of the diffusion of innovations (Rogers, 1962).
- The theory of reasoned action (TRA) (Ajzen and Fishbein, 1975),
- The motivation model (Davis et al., 1992),
- The theory of planned behavior (TPC) (Ajzen, 1991),
- The model combining TAM and TCP (C-TAM-TCP, Taylor and Todd, 1995),
- The model of using a personal computer (Triandis, 1977; Thompson, Higgins et Howell, 1991)-
- Social cognitive theory (Bandura 1989, Compeau and Higgins 1995).

Each model tries to predict the behavior of users using a variety of independent variables. A unified model was created based on similarities conceptual and empirical of these eight models.

The intention to adopt a technology and its use are therefore considered as dependent constructs and the UTAUT (2003) is interested in their determinants. The model of UTAUT (2008) has also been enriched with new constructs that resides in the integration of a new variable which is the behavioral expectation to respond to particular contexts.

After this synthesis, the UTAUT (2003/2008) finally retains:

- Three direct determining elements of intention: the expected performance, the expected effort and social influence.
- Two direct determining elements of behavioral expectation: social influence and facilitating conditions.
- Three direct determining elements of use: the facilitating conditions and the expected intention and behavioral expectation.
- Four moderating variables: gender, age, experience and voluntariness of use.

B. The UTAUT model in the field of e-learning

Since the release of UTAUT in 2003, researchers, more and more, held him to explain the adoption of new technologies in General and in particular e-learning. The UTAUT is positioned as the model has the best coefficient of determination (R^2) of use of technology.

The model was used in the academic world to explain the determinants of adoption of e-learning in different contexts (Marchewka and al., 2007, Marchewka, Liu & Kurt, 2007, Chang & Tung, 2008, Lassoued, 2010).

III. ADAPTATION OF THE UTAUT MODEL AND RESEARCH HYPOTHESES

All modeling is necessarily based on choices in the variables. The objective of this part is to detail the seven variables used, knowing that the choice of the latter in the context of this article is heavily inspired from Venkatesh et al. UTAUT model (2003/2008) namely the performance expected, the effort expected and social influence, facilitating conditions, the expected behavior and intention. However, the ultimate goal of our research is to determine the factors of success if we integrate e-learning in the teaching practices Of the Moroccan Ministry of Education teachers.

A. The performance expectancy (perceived usefulness)

Venkatesh and al, (2003) defined the performance expectancy by “the degree to which the user expects that using the system will help him or her to attain gains in job performance”.

The performance expectancy construct consists of four criteria: the perceived usefulness, the extrinsic motivation, the job fit, and the relative advantage.

- **Perceived usefulness** is defined as the extent to which people believe that using a new technology can improve

their job performance

- **Extrinsic motivation** is “the motivation of the person”
- **The Job fit** is “the extent to which an individual believes that using a technology can enhance the performance of his or her job”.
- **The relative advantage** is "the degree to which an innovation is perceived as offering a superior advantage to practice what she supplants”.

On the other hand, several studies on the adoption of the technology showed that the concept of the perceived usefulness had a very powerful predictive power and that it had proven its robustness in the explanation of the behavior of use across many studies.

One relying on a large number of empirical studies later, researchers who developed the UTAUT model show that the perceived usefulness is the main determinant of the intention to use a system.

But more specifically, the perceived usefulness of the useful rest e-learning among teachers, when the latter has advantages compared to other types of training including face-to-face training.

In conclusion, e-learning can be accepted by a teacher if he believes that the use of this technology will help him get these teaching practices performance gains.

Finally, we have retained the only variable ‘perceived usefulness’ as determinant of the intention to use e-learning by teachers. The hypothesis that follows is presented as follows:

Hypothesis1: The Perceived usefulness will have a significant influence on behavioral intention.

B. Effort Expectancy (perceived ease of use)

Venkatesh and al, (2003) defined the effort expected by “the degree of ease associated with the use of the system”. Three variables from theory to measure the effort expectancy:

- **The perceived ease of use:** the perceived ease of use refers to the degree to which people believe that using a technology would be free of effort. (Davis. 1989).
- **The complexity:** that complexity is the degree to which an innovative technology is identified as relatively difficult to use and understand (Thompson et al. 1991).
- **The ease of use:** in comparison to the perceived ease of use, the ease of use is defined as the degree to which using an innovative technology or product is identified as being difficult or easy to use (Moore et Benbasat (1991).

The perceived ease of use is compared from 'compatibility' and 'complexity' concepts of the theory of the diffusion of innovations of Rogers (1995). That's why they define the same notion of ease of use and are measured in the same way.

In the study of Birch (2009) on the acceptability of ICT with a public of 82 students engaged in a course of professionalization in the teaching profession, The perceived ease of use is also the only factor for which a significant relationship could be established with the intention to use ICT in the classroom.

The perceived ease of use seems to us so the main factor of the intention of teachers to participate in training in e-learning.

We offer the hypothesis:

Hypothesis2: The perceived ease of use will have a significant influence on behavioral intention

C. Social Influence

Venkatesh and al, (2003) defined social influence as the degree of importance being recognized by others to use a novel technology. According to the empirical studies carried out later, researchers (Venkatesh and al, (2003)) who have developed the UTAUT model show that the social influence is a built in direct link with the intention.

In 2008, Venkatesh and Bala show that social influence is a determinant also of the behavioral expectation.

We offer the hypothesis:

Hypothesis3: social influence will have a significant influence on behavioral intention

Hypothesis4: social influence will have a significant influence on behavioral expectation.

The social influence construct consists of three variables: the subjective norm, the social factor, and the image.

- **Subjective norm:** the subjective norm is the perceived social pressure to perform or not to perform the behavior.
- **Social factor:** the social factor is an individual's internalization from the social system's subjective culture and particular interpersonal agreements that the individual in particular social situation has made with others.
- **Image:** the image is defined as the degree to which an individual identifies that the using of an innovative technology can enhance an individual's status in his or her social organization.

Therefore, we will resume these formulations to refer more directly to individuals or groups person likely to social influence on teachers in order to use e-learning.

We believe that the colleagues are people likely to influence most teachers that teachers, who think that their colleagues would participate in a device in e-learning, are more favorable to e-learning than others.

However, other elements can influence teachers in order to use e-learning in particular the hierarchical role of principals and even educational inspectors.

We offer the hypothesis:

Hypothesis3-a: Influence of colleagues will have a significant influence on social influence

Hypothesis3-b: Influence of superiors will have a significant influence on social influence.

Hypothesis3-c: self-image will have a significant influence on social influence.

D. Facilitating Conditions

Facilitating Conditions are defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh et al, 2003, p.453).

Venkatesh and Bala in 2008, specify that the facilitating conditions are determinants of the expected behavior.

Facilitating conditions are therefore decisive factors of the expected behavior of the teachers. Subsequently the assumption that we offer is presented as follows:

Hypothesis 5: Facilitating conditions will have a significant influence on expected behavior.

The facilitating conditions construct consists of three variables: the facilitating conditions, the compatibility, and the perceived behavior control:

We will therefore resume these formulations for the importance of the 'technical assistance' factor in the understanding of the expected behavior of teachers towards e-learning. We offer the hypothesis:

Hypothesis 6-a: Technical assistance will have a significant influence on the facilitating conditions.

According to the work of Venkatesh et al. (2003), the compatibility between the tasks to be performed and the technology used is regarded as having a direct influence on the use. Indeed, in our case the teacher believes that compatibility with the pedagogical work encouraged him to use e-learning. That's why we hypothesize that follows:

Hypothesis 6-b: That compatibility will have a significant influence on facilitating conditions.

Built that allow to measure the facilitating conditions include the perceived behavior control.

To this end, we consider the influence of the availability of resources and the necessary knowledge is essential to the use of e-learning, similarly, when the services of the MNEM demonstrate clear commitment to e-learning and strongly support the use of this technology, the teacher will be automatically encouraged to use e-learning. This brings us to propose the following two assumptions:

Hypothesis 6-c: The perceived behavior control will have a significant influence on facilitating conditions.

Hypothesis 6-d: The involvement of the central service will have a significant influence on facilitating conditions.

E. Behavioral Intention

Fishbein and Ajzen, (1975) have defined Behavioral Intention by the subjective probability that a person adopts the conduct in question. It is an indicator that measures the degree of acceptance of the system.

When a teacher expresses its intention to use e-learning, this indicates that the behavior expected in this technology is positive and that he considered an acceptable means in the context of training continues. This brings us to propose the following hypothesis:

Hypothesis 7: The behavioral intention will have a significant influence on expected behavior.

F. Mediator variable

The UTAUT model holds four moderating variables: gender, age, experience and voluntariness of use. For the sake of context namely: a population of homogenous teachers, who had the same formation, we chose to exclude the moderating variables: gender, experience and voluntariness of use. We have kept the variable age moderator.

Next, read, Yu & Liu, 2009; Venkatesh et al, 2003) the age, has been tested to moderate the links between the perceived usability, the perceived usefulness, social influence and facilitating conditions. Of the work of Venkatesh et al. (2003/2008), we also expect that age moderates the relationship between:

- Social influence and behavioral intention
- Social influence and expected behavior
- Facilitating conditions and expected behavior

G. Proposed structural model

The objective of this research is to explain the factors involved in the adoption or rejection of the e-learning process in a context of continuous training of teachers of the MNEM. For this, our research model designed for this study relies mainly on the unified version of the adoption and use of technology (UTAUT) Venkatesh and al. (2003/2008) by adapting it to the context. Moreover, our research model may be presented by the following figure:

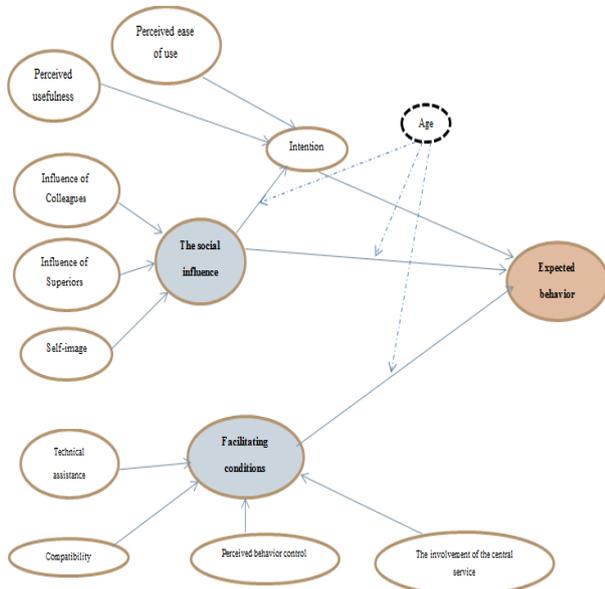


Fig. 1: The model of research

IV. EMPIRICAL STUDY

In this part, we will test the assumptions and validate the search pattern, while exposing our results obtained in two ways:

- First axis is to describe the statistical properties of each built the model in terms of factorial structures and reliability in order to develop a stable factor structure.
- Second axis is to validate the model of measurement and check of the construct psychometric qualities, prior to the statistical tests in order to confirm or disprove our hypotheses of research.

A. Methodological approach

Our research questionnaire was developed from a synthesis of research on adoption of information systems.

Used items have been drawn in the literature including the work of Venkatesh and al, (2003) and (2008).

Changes were made to items selected in order to adapt them to the context of the adoption of e-learning among teachers of the Moroccan national education Department.

The constructs and items that used to assess each variable are summarized in the table below:

Table 01: The construct and the selected items

Constructs	Items	SOURCES
Perceived usefulness	UP1: I think that e-learning is useful for my work in the classroom	Venkatesh et al.(2003)
	UP2: I think that use of the Collab platform will help me accomplish my tasks in the classroom in a better way	
	UP3: I think the use of platform Collab makes my job easier,	
	UP4: I think that the use of e-learning can increase my educational productivity.	
Perceived ease of use	FUP1: It will be easy for me to learn to use the Collab platform for my classroom practice:	Venkatesh et al. (2003).
	FUP2: I found the - platform Collab easy to use for my classroom practices	
	FUP3: I have difficulties in the use of the Collab platform.	
	FUP4: I think it will be easy for me to become proficient in the use of the Collab platform.	
The social influence	IC1: The majority of my colleagues use the Collab platform for e-learning.	Schillewaert et Al (2001)
	IC2: Most of my colleagues are present and active on the Collab platform.	
	IS1: I'm always encouraged by my superior hierarchical direct (pedagogical Inspector, Director of the school) to use the Collab platform.	Venkatesh et al.(2008)
	IS2: My superior hierarchical direct (pedagogical, Director of the school inspector) is convinced of the benefits of the training remotely.	
	ISO11 : In my work, teachers who use the Collab platform for e-learning have more prestige than those who do not use it.	Venkatesh et al.(2008)
	ISO12: In my work, teachers who use the Collab platform for distance learning have a good image.	
ISO13: Use the Collab platform for e-learning is professionally rewarding		
Technical assistance	AT1: Active colleagues on the Collab platform are always available to help those in need	Venkatesh et al.(2008)
	AT2: division e-learning of the Department has a service ready to help if needed.	
	AT3: The necessary instructions for the proper use of the Collab platform are available to me.	
Compatibility	CAT1: I think that the teaching content of the Collab platform is adapted to the nature of my work in the classroom.	Venkatesh et al.(2008)
	CAT2: I think the use of the Collab platform fits with my style of teaching.	
	CAT3: I think the Collab platform offers features that I need for my teaching duties.	
Facilitating conditions	CPC1: I could master the use of the Collab platform	Venkatesh et al.(2008)
	CPC2: I think I have the resources to use the Collab platform.	
	CPC3: I think I have the necessary knowledge to use the Collab platform.	
	CPC4: I think the use of the Collab platform will allow me to improve or continue to improve the quality of my work in the classroom.	
The involvement of the central service	ISC1: The central services of the Ministry grant a special interest in e-learning.	Venkatesh et al.(2008)
	ISC2: The central services of the Department are clear and remarkable commitment to e-learning.	
	ISC3: The use of e-learning is strongly supported and recommended by the Department's services.	
Expected behavior	CA1: I expect to use the Collab platform soon.	Venkatesh et al.(2008)
	CA2: I'll use the Collab platform soon.	
	CA3: I'll probably use the platform Collab soon.	
	CA4: I'll use the Collab platform soon.	
Intention	INT1: I intend to use the Collab platform soon.	Venkatesh et al.(2008)
	INT2: I plan to use the platform Collab soon.	
	INT3: I planned to use the platform Collab soon.	

The survey is based on the questionnaire. The latter was distributed to a very large population of teachers which is part of the Department of national education. The

questionnaire was circulated to 262 teachers who master the tool of technology of information and communication ICT but that are not yet active on the platform Collab (not Collabiens) distributed throughout the national territory.

An analysis of the structure of the sample provides us with the following information:

On the 262 questionnaires distributed, we harvested 239 responses either 96% of answers.

Among the 239 questionnaires, 28 proved to be invalid, as these respondents have failed to respond to more than 50% of the questions. The descriptive statistics of the final sample are summarized in the table below:

Table 02: Composition of the final sample by kind

Features	Number of questionnaires distributed	Number of surveys collected	Number of valid questionnaires	Genre	
				Men	Frequency in workforce
No Collabiens	262	239	211	Men	123
				women	88

Table 03: Composition of the final sample by age

Features	Number of valid questionnaires	Age		
		Age	Frequency	Percentage
No Collabiens	211	Less than 25 years	41	19%
		25 to 34 years	23	11%
		From 35 to 50 years	65	31%
		more than 50 years	82	39%

B. Validation of measuring instruments

The purpose of this paragraph is to validate the measurement scales, as well as to purify the measuring instruments using the two techniques "factor analysis and internal reliability test" by the method of principal components analysis (PCA) using the software SPSS 19.0.

To do this, certain criteria have been identified during analysis of the results to find out:

- Kaiser Meyer Olkin (KMO) index which must be greater than 0.5
- review of factorial contributions and communities who must be greater than 0.5
- The cronbach's alpha coefficient, which must be greater than 0.6

We submitted the scales to the factor analysis and based on the results, items will be eliminated in order to improve the measure tool and then we tested the internal reliability of scales. To test the measurement scales, exploratory factorial analysis of the collected data was conducted. Principal components analysis is launched on the initial set of items in the variables, all the results are grouped for each variable in the table below:

Table 04: Summary of the results of the validation of measuring instruments

Scale variables	Number of Items	KMO	Valeur propre	% of the variance	Alpha de Cronbach	Change
<i>Perceived usefulness</i>	3	0.703	2.319	57.981	0.757	Removal of item 1
<i>Perceived ease of use</i>	3	0.646	2.141	69.282	0.766	Removal of item 3
Influence of Superiors	2	0.5	1.632	81.603	0.774	No changes
Self-image	3	0.549	1.795	59.828	0.659	Removal of item 4
Technical assistance	3	0.649	2.316	77.195	0.814	No changes
Compatibility	3	0.648	2.299	76.626	0.807	No changes
Perceived behavior control	4	0.647	2.760	69.01	0.603	No changes
The involvement of the central service	3	0.737	2.426	80.863	0.871	No changes
<i>Expected behavior</i>	3	0.809	3.125	78.123	0.904	Removal of item 1
<i>Intention</i>	2	0.682	2.160	71.988	0.8	Removal of item 3

This axis was dedicated to the validation of measuring instruments, stage prior to any phase of tests of hypotheses.

C. The validation of the measurement model

Formel and Larcker indicated that "after the exploratory factor analysis, it is recommended to validate the measurement model". The second-order structural equation model is particularly important in the case of our research. Thus the use of this method is justified by the complexity of the proposed research model, and on the other hand by the fact that this method helps to explain the existing causal links between the different built allowing assessing the adequacy of the model studied in the data.

Subsequently, our choice fell on the PLS method. Sosik & al (2009) state that "the PLS method works better in practice, because the field data used in modeling are never perfect, and are often highly correlated". The construction of the model, the evaluation of the model of measures and the evaluation of the structural model are made on the basis of the graphic interface and Smart PLS 2.0 software validation techniques.

Our research model is characterized by two types of built (formative, reflexive).

We rely on the works of Urbach and Ahlemam in 2010 that offer two different approaches to ensuring the verification of the validity and reliability of the scales of the construct.

1) Reliability and validation of the reflexive measures:

Several methods offer the possibility to assess the reliability of a measuring instrument. Nunnally, Bernstein, Fornell and Larcker specify that the key indicators for the validation of the constructed reflective are (loading > 0.70), the reliability of the construct (CR > 0.7) and convergent validity (AVE > 0.5).

In the table below, we summarize the results of reliability and convergent validity of the measurement model:

Table 05: Result of reliability and convergent validating the measurement model

Construits	Items	Loading	AVE	Fiabilité Composite	Cronbachs Alpha
Perceived ease of use	Perceived ease of use1	0,829234	0,7279	0,842416	0,627936
	Perceived ease of use4	0,876441			
Perceived usefulness	Perceived usefulness1	0,947215	0,7146	0,83082	0,670258
	Perceived usefulness4	0,735889			
Self-image	Self-image1	0,747101	0,5982	0,816209	0,660232
	Self-image2	0,852745			
	Self-image3	0,713719			
Technical assistance	Technical assistance1	0,838486	0,7718	0,910112	0,850975
	Technical assistance2	0,934533			
	Technical assistance3	0,859672			
Compatibility	Compatibility1	0,827493	0,7662	0,907451	0,8461
	Compatibility2	0,932435			
	Compatibility3	0,862735			

satisfactory. Chin (1998) says that it is recommended it is greater than the variance shared between the construct and the other built model. We can therefore this way assess the discriminant validity. If it is not satisfactory, then this explains that the construct and their actions cannot be discriminated adequately and that it is therefore inappropriate to see as theoretical entities distinct and separate. What led us to merge the construct two technical assistance and compatibility. We can summarize the key indicators for the discriminant validity of the construct reflective model after merging in the following table:

Table 06: Result of the discriminatory validity:

	Technical assistance and Compatibility	Expected behavior	Perceived behavior control	Perceived ease of use	Image	The involvement of the central service	Intention	Perceived usefulness
Technical assistance and Compatibility	0,7481							
Expected behavior	0,5628	0,7811						
Perceived behavior control	0,4801	0,333	0,6892					
Perceived ease of use	0,0004	0,0077	0,0185	0,7279				
Image	0,0157	0,0779	0,0175	0,0004	0,5983			
The involvement of the central service	0,0209	0,0057	0,0021	0,009	0,0146	0,782		
Intention	0,4205	0,4906	0,2773	0,0089	0,0394	0,0106	0,7182	
Perceived usefulness	0,001	0,0873	0,0727	0,0002	0,0178	0,0066	0,013	0,7193

Construits	Items	Loading	AVE	Fiabilité Composite	Cronbachs Alpha
Perceived behavior control	Perceived behavior control1	0,730306	0,6892	0,898047	0,847908
	Perceived behavior control2	0,835483			
	Perceived behavior control3	0,925927			
	Perceived behavior control4	0,817393			
The involvement of the central service	The involvement of the central service1	0,897026	0,782	0,91444	0,881538
	The involvement of the central service2	0,963598			
	The involvement of the central service3	0,782916			
Expected behavior	Expected behavior1	0,861122	0,7811	0,934328	0,905647
	Expected behavior2	0,943517			
	Expected behavior3	0,815653			
	Expected behavior4	0,909506			
Intention	Intention1	0,8691	0,718	0,884179	0,80461
	Intention2	0,851519			
	Intention3	0,820717			

The results in table 05 show reliability and convergent validity of the measurement model.

Also, the discriminant validity is checked using the rules of Fornell and Larcker, who suggest that the proportion of the variances extracted for each built should be superior to the square of its coefficients of correlation with other built of our research model.

The results of the correlations between the construct show that the correlation value between the construct technical assistance and compatibility with the work is very close to 1 what explains that the discriminant validity is not

The results of table 06 show that the values of the AVE (diagonal) are superior to the squares of the correlations between the different built (off-diagonal) suggested by Fornell and Larcker, which explains the discriminant validity.

2) *The reliability and validity of the construct formative*

To study the reliability and validity of the training construct, we have established an alternative approach in two steps (the validity of the items related to each are built and the review of multi collinearity) since the average variance extracted or the alpha of Cronbach are useless in this case. Because PLS is unable to calculate those factors, we have resorted to the SPSS software for this purpose.

Indicators of contributions are significant compared to their built, when their statistical values evaluated through the T-Student they are superior to 2.58, and for the validity of the items relating to each of the construct, then values the contributions of items to be built must be above the threshold of 0.2 recommended by Chin.

The results show that the indicators present significant contributions from their built, with the exception of the items of the involvement of the central service built which led us to reconsider the validity of the items related to each of the construct of the model through the technique of bootstrap by removing this built.

Even the validity of the items, relating to each of the construct through by bootstrap resampling technique, the model is validated as they vary between 0.705 and 0.926.

In the table below, we summarize the psychometric

properties of the formative scale after removal of the involvement of the central service built:

Table 07: Psychometric properties of the formative measurement scale

Constructs	Items	T Statistic	Contribution of items to the built	Contributions of the built dimensions	T Statistic
Facilitating conditions	Technical assistance1	31,442643	0,820324	0,705766	38,71148
	Technical assistance2	99,698507	0,920082		
	Technical assistance3	51,667989	0,854054		
	Compatibility1	30,220152	0,815409		
	Compatibility2	60,04981	0,912084		
	Compatibility3	55,384061	0,8594		
Perceived behavior control	Perceived behavior control1	26,270548	0,730935	0,364319	25,483547
	Perceived behavior control2	38,700901	0,833313		
	Perceived behavior control3	109,883201	0,9263		
	Perceived behavior control4	41,668945	0,817252		
The social influence	image1	21,58856	0,74972	0,999774	6740,9768
	image3	45,4356	0,853673		
	image2	15,034773	0,705136		

Where the total relevance of our indicators and their validity compared to the construct to which they are attached. To examine the multi collinearity between the indicators of the variables, we calculated the values of high heat (the variance inflation factors).

The main results of the review of multi- collinearity between the variables indicators are summarized in the table below:

Table 08: Outcome of the review of multi-collinearity:

Independent variables	Dependent variables		
	Technical assistance and Compatibility	Image	Perceived behavior control
	VIF	VIF	VIF
Compatibility 1	1,945		
Compatibility2	3,18		
Compatibility3	2,197		
Technical assistance 1	2,069		
Technical assistance 2	3,283		
Technical assistance 3	2,162		
image1		1,32	
image2		1,542	
image3		1,245	
Perceived behavior control1			2,189
Perceived behavior control2			2,175
Perceived behavior control3			4,395
Perceived behavior control4			3,216

The previous table shows that all high heat values are lower than the 5 which proves the absence of multi-collinearity. So, our model of measurement is reliable. The structural model test is illustrated by the following figure (fig02)

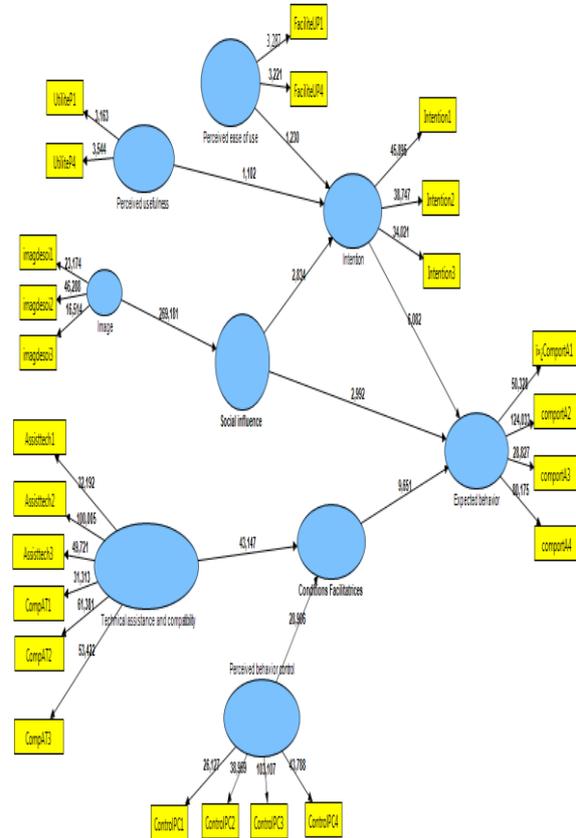


Fig02: Structural model to test links:

The results prove that the reflexive and formative measures meet the recommended criteria of reliability and validity. The results of the structural model will be presented in the next paragraph and therefore the research hypotheses will be tested.

D. The valuation of the structural model

Under the PLS, the structural model is evaluated based on the predictive relevance of the latent variables. The quality of the global model can be estimated by observing the coefficients of determination (R^2).

Falk & Miller (1992) suggest that a "good model" obtained by regression PLS must be greater than 0.1 coefficients of determination. In our case we have resorted to the bootstrap, as it provides two key measures of the structural model: The value of the t-Student and the R^2 value.

We calculated the R^2 by the procedure of bootstrap associated with the ultimate dependent variable in our model, we get a coefficient $R^2 = 0.657 (> 0.1)$, indicating that 65.70% the use of the indicator expected behavior can be explained by the construct used in the model.

Thus, our structural model is illustrated by the following figure (Fig. 03):

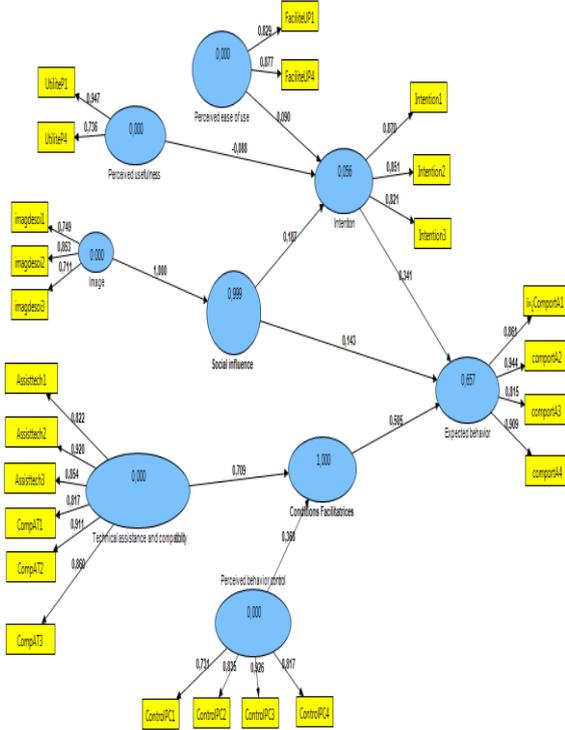


Fig. 03: Structural links of the model tested (using the software Smart PLS)

The predictive model significance can also be appreciated by the coefficient Q^2 of Stone-Geisser. This coefficient is developed through the Smart PLS procedure (Blindfolding). In our model the Stone Q^2 coefficient Geisser is equal to 43.58%, this coefficient associated with the dependent variables (expected behavior, facilitating conditions, social influence and intention) is higher than 0.1 recommended by Hair in 2013. We can also consider these results as being satisfactory. GoF is another tool which was used to verify the overall quality of the model.

This index is obtained on the basis of the average for the various built of the explained variance (R^2) and index the commonality:

$$GoF = \sqrt{Moyenne(R^2) * Moyenne(Community)}$$

According to the results, the GoF of the model index is very satisfying (GoF = 68.37%) because its value is far greater than the recommended 30% threshold. This leads us to say that all of the criteria of the evaluation of the structural model are satisfactory.

So we are going to test the research hypotheses by assessing the significance of the coefficients standardized following the procedure under Smart PLS bootstrapping. These tests will be the point that follows.

E. Evaluating the research hypotheses:

The next step is to test the research hypotheses. To check our hypothesis, we calculated coefficients of correlations between variables (path coefficient) and their significance level (by the T Student) using the bootstrap technique calculated by the PLS method. The main results of the

research hypothesis tests are summarized in the table below. They show that seven postulated hypothesis have been confirmed, while two others have been overturned.

Table 09: the result of the test of hypotheses

Description	Original Sample	T Statistics
Technical assistance and Compatibility -> Facilitating conditions	0,709437	39,39502
Facilitating conditions-> Expected behavior	0,504646	9,546839
Perceived behavior control -> Facilitating conditions	0,36765	26,31127
Perceived ease of use -> Intention	0,089299	1,213538
Image -> The social influence	0,999828	8327,254
The social influence ->Expected behavior	0,142915	2,990327
The social influence -> Intention	0,188936	3,133359
Intention -> Expected behavior	0,340893	5,921227
Perceived usefulness -> Intention	-0,0873	1,125484
R² : Variance explained (Expected behavior)	65.70%	

To summarize the results of our entire hypothesis, we propose the following table:

Table 10: Summary of the results of the research hypotheses

Hypothesis	Result
H01: Technical assistance and Compatibility will have a significant influence on facilitating conditions.	Accepted
H02: Facilitating conditions will have a significant influence on expected behavior.	Accepted
H03: the perceived behavior control will have a significant influence on facilitating conditions.	Accepted
H04:The perceived ease of use will have a significant influence on behavioral intention	Rejected
H05:self-image will have a significant influence on social influence	Accepted
H06: social influence will have a significant influence on behavioral expectation	Accepted
H07: social influence will have a significant influence on behavioral intention	Accepted
H08: the behavioral intention will have a significant influence on expected behavior.	Accepted
H09: The Perceived usefulness will have a significant influence on behavioral intention	Rejected

F. The test of the moderating effects of age

The moderating effects of the age test is adapted to the PLS regression models and is available in the software Smart PLS. The relationship between a variable X (independent) and a variable Y (dependent) will be tested by the construction of a multiplicative variable (X * age).

This new variable represents the interaction between the moderator and the independent variable effect.

Regression equations are:

Model 1: $Y = a + b1.X + b2.age$

Model 2: $Y = a + b1X + b2.age + b3.(X * age)$.

We consider that there is a moderating effect when the following conditions are met:

- The coefficient of determination (R^2) of the second regression is higher than that of the first (without moderating effect).
- The $b3$ regression coefficient is significant.

Table 11: results of the effect of the variable age moderator

Hypothesis	Model with age effect	
	The structural coefficient	T Statistics
social influence * age -> Intention	0.145	0.892
Intention * age -> expected behavior	-0.047	0.591
social influence * age -> expected behavior	-0.097	1.076
Facilitating conditions * age -> expected behavior	0.028	0.270

So, we notice that there is absence of a moderating effect of the variable age in the different tested relationships tested (social influence -> intention; Intention -> behavior expected; Social influence -> behavior expected and facilitating conditions -> expected behavior) seen the T of Student values.

V. DISCUSSION ON THE RESULTS OF RESEARCH

Our main research hypothesis was that the three variables: Intention, social influence, and facilitating conditions of the UTAUT model are able to explain the behavior expected of adoption of e-learning. We consider this as validated hypothesis.

Those three builds explain for 66% of the behavior expected adoption of the e-learning. Venkatesh and al, (2003) defined social influence as the degree of importance being recognized by others to use a novel technology.

This variable encompasses several dimensions: image, the influence of superiors and colleagues the influence.

As we have mentioned previously, the last two dimensions are not the determinants of social influence for this population. Only the dimension of image helps explain the social influence. The latter contributes positively to the explanation of the 'intention' and 'expected behavior'.

Therefore seek to develop teachers who use the Collab platform, which would have the effect of encouraging other teachers to use this tool. Build it 'facilitating conditions' affect the "expected behavior".

Improve technical assistance, show the compatibility of the platform with labor and make it more accessible are therefore likely to encourage the use of e-learning.

Furthermore the results show that the links between the perceived ease of use and intention on the one hand as well as the perceived usefulness and intention on the other side are not significant contrary to literature (Yang et al. ((2005), Lee (2008)).

Act on these levers will not much effect on the intent of the use of e-learning.

In conclusion, we have sought to identify the factors that promote the acceptance of e-learning within the Department of the Moroccan national Education.

The results of this study may allow the Collab program managers to identify areas that are important to take into account to ensure its full success.

VI. CONCLUSION

In conclusion, we have sought to identify the factors that promote the acceptance of e-learning within the Department of the Moroccan national Education.

The results of this study may allow the Collab program managers to identify areas that are important to take into account to ensure its full success.

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