

Impact of computer-based discussion forums on the success of learners in a distance learning computer device: the case of continuing education for Moroccan teachers

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ABSTRACT

This article is part of an exploratory study to investigate empirically (N=429) the role of learners' active participation in computer-based discussion forums on their success in distance learning (DL). For this, we have chosen to study two criteria: the number of their connections to the computer platform and their actions on the forum. In this way, we have tried to target the structural and functional aspects of these forums. Thus, we will first highlight the major role of the discussion forum in the success of computer-based discussion forums (DF) on different levels from a literature review. Secondly, we will analyze the scores obtained by learners during a distance in-service training for teachers entitled "Communication in the classroom". We take the "FADEEP" online teaching platform as the field of investigation and target population the Moroccan teachers who have benefited from the said training. Finally, we conducted a series of interviews with the actors involved in the DL (N=20).

Key words : computer-based discussion forums, Distance Learning (DL), computer device, Learner Participation in DF, Tutor .

1. INTRODUCTION

Our study focuses on the impact of a key aspect that is expected to improve the quality of DL outputs. The aim is to measure the impact of the active participation of teachers receiving DL on their success. The choice of this study stems from this increasingly tangible desire expressed by decision-makers to diversify the modalities of in-service teacher training in our country.

This study is part of our overall project to improve the factors and variables that impact the quality of a DL. Therefore, DF constitute a basis of information that must be used, not only to make decisions about the management of a training or training session (managerial purpose), but also to build a model that will allow us to know when useful and usable information

from DF can predict whether a DL could be considered as a quality DL (Scientific purpose).

We will first start with a literature review that focused on the DF. We have focused most on the success factors that are intended to improve the quality of a DL and on the difficulties and dysfunctions that can negatively affect this quality. The literature review is finalized by a section dedicated to the quality criteria of a DL related to the DF. The empirical study of the impact of "active participation in the DF" on "success in the DL" was carried out through the use of a database composed of teachers' scores obtained during aDL provided by the "FADEEP" association as part of the in-service training of Moroccan teachers. The statistical processing carried out on the data in this database has enabled us to obtain several results that will be presented just before the final conclusion.

2. THEORETICAL ASPECTS

In this section, we will limit ourselves to presenting some theoretical elements related to the importance of DF for the success of a given DL, the factors that can prevent or make it difficult for these DF to succeed and some criteria that can improve the quality of these DF.

Advantages and roles of the DF

We will try to answer the following questions here: What are the advantages of DF? When is a DF beneficial for a DL? And what are the functions it allows?

2.1 Pedagogical level

The DF is an essential element in a DL, it offers a range of pedagogical assets likely to promote the success of learners following a pedagogical of strategy teaching and support [1] based on the exchange of methods that will facilitate online learning [2] and the sharing of ideas between learners [3]. DF can have different pedagogical statutes, their classification depends on the learning activity [5]. The advantages of DF can be considered in different forms:

Exploiting the traces of the DF: Reading the messages leads to a change of opinion on the part of the learner who tries to include this change in the contributions [5]. In addition, the asynchronous aspect gives the learner more time to reflect on the messages of others [6,7].

Contribution to the construction and self-assessment of knowledge: Interactions with peers allow the development of the learner's critical thinking skills(3). The collaborative and cooperative aspects of the DL promote the co-construction of knowledge(Allan, 2004; Strioukova, 2006).The DF tool also allows knowledge assessment by providing clearer visibility on learners' progress in a DL [6,8].

The integration of learners: Exploiting the benefits of this tool can reduce learners' feelings of isolation and loneliness [9], give them a sense of the presence of others and fosters a sense of community(1), that help learners to integrate easily into the DL and also reduce the particularly high dropout rate inherent in this online training modality [1-].

2.2 Technical & Organizational level

Exchanges within DF are of different kinds: organizational, technical and pedagogical [2]. Generally, the DF allows:

- Elimination of distance for geographically dispersed learners and reduction of the abundance rate [2,10];
- Development of learners' visibility on all other people's productions and the use of the asynchronous aspect of the forum to communicate offline [5,].

A study conducted in the Moroccan context has shown that the DF is the most appropriate tool for the DL mode [11]. It allows us to save and retrieve recorded data and files. It is also the technical ease of use that makes DF a source of attractiveness for learners [2], during the start-up phase, the animator is very active and is responsible for responding to the difficulties encountered by learners and becomes less present afterward, in order to give very active learners the opportunity to take the initiative to get to know each other, communicate with each other and help each other [2].

2.3 Factors hindering the success of the DF

There are various obstacles that can hinder the achievement of the full potential of DF, it is not possible to claim that we can identify exhaustively the factors that hinder the achievement of this objective, that is why we have classified them into two main classes: the peripheral use of DF by learners and the perception of the lack of utility of DF.

2.4 Peripheral use of DF by learners Passive participation

In the absence of pedagogical actors, the DF is incapable in itself of ensuring the exchange operation [12]. Several manifestations of passive participation on the part of the learner were revealed: participation often being reduced to questions-answers producing too short exchanges without any

significant contribution to the quality of learning [10]; dominance of tutor responses over learner-to-learner exchanges [4] and learners use the content of the DF without having to post their problems [13].

2.5 The fictitious contribution and its impact.

The lack of communication skills among learners and the misuse of the tool due to the ease of manipulation generate, on the one hand, an overabundance of messages that hinder the quality of the DF and increase, on the other hand, the workload of the tutor who is supposed to read and respond to the various messages generated [8], such a situation results in a fictitious contribution that is presented as a real obstacle to the active use of the DF [11]. We should also add the deficiencies in training and the diversified benefits of the participants [1].

2.6 Perception of the lack of usefulness of DF. Low perception of usefulness

This is a perception due: to a deficiency in the pedagogical exploitation of the DF's potentialities, the perceived lack of relevance of this tool [3];to the entrenched individualistic and competitive culture which induces the operation of exchange and sharing [2]. In addition, the public nature of the forum is perceived as a kind of submission to others, which impacts the self-image. The feeling of being lost between the abundance of messages posted and their chronological organization [12] feeds also the deficit of perceived utility.

2.7 Mode not suitable for learners

This inadequacy is identified with in many learners' behaviors and attitudes: some learners use other tools that are easier than the DF tool or consider messaging and telephoning more familiar [2]. There is also the requirement of high reflexivity on the part of the learner before publishing his message [1] well as the difficult relationship of learners with the written word [12], add the absence of non-verbal signals in communication within the DF [7], these are factors that create in the learner a feeling of refusal to use this tool.

2.8 DF quality criteria related to actors and factors

Based on the exploitation of the advantages of DF,we will divide its quality criteria into two main classes: DF effectiveness criteria related to actors and DF effectiveness criteria related to factors.

2.9 DF effectiveness criteria related to actors. Criteria related to learners

Learners are the driving force behind the functioning of the DF, otherwise, the effectiveness of the DF is not as a means of disseminating information but can take place from the

moment it becomes operational through learner exchanges [10]. It is through DF that learners will be able to solve a problem together, obviously based on their knowledge and on the resource bank of different contributions [1], which is perfectly in line with the positive interdependence of the participants' objectives, as well as with the spirit of active collaboration in order to produce group work [7]. As a result, exchanges between learners that go beyond the simple "question-answer" are considered to be factors in the success of the DF [10].

2.10 Criteria related to tutors

The tutor's feedback has a positive impact on the effectiveness of the DF, provided that his presence is not dominant over the discussion so that it leaves room for learners to exchange and collaborate with each other [10]. In general, the tutor's intervention is only desirable when the discussion thread extends too far and no learner can come up with an answer, in this case it is sufficient to provide reminders in the form of clues and instructions [13]. Particular attention must be paid by tutors to feedback, a poorly expressed message from them can influence the participation of learners as it can even be a source of dropout [9,13].

2.11 DF effectiveness criteria related to factors

The different criteria for the effectiveness of DF identified from the literature review can be classified into two categories: the first category groups together criteria related to the context of the DF; the second groups together criteria related to the different dimensions and which are required as objective criteria.

2.12 Criteria related to the forum context

Special attention should be paid to the context of the use of DF rather than limiting itself to the DF itself. Consequently, we can identify the appropriate method likely to inform us about the general context and the development of the DF, which remains strongly linked to the structure of the task, it is this structure that impacts participation in the DF as well as the nature of the exchanges, which is why a task-based pedagogy promotes collective learning and constitutes a success factor for the DF[9].

2.13 Criteria related to the different dimensions

Pedagogical, technical and organizational factors influence the relevance and the crucial role of the DF in the DL process. Therefore, measures have been taken into consideration, which is why great interest has been given to the DF as a central and not peripheral approach in the DL, all the exchanges produced constitute a resource bank and a reference for learners, hence the need for a charter governing the form of interactions, the rigour, concision and focus on the essential being the criteria of a relevant DF. A powerful ergonomics facilitating the reading of messages is useful especially with the overabundance of messages [7,9]. Other part, Mary Allan proposed in her study the concept of "Event

Centres" which facilitates the processing of information to keep only the most important messages and to reject unnecessary ones (Mary Allan, 2004). These measures promote the development of a quality contribution and therefore the effectiveness of the DF. In addition, participation and collaboration within the DF must follow a well-defined pedagogical scenario based on interactivity and the active involvement of learners in this process. Finalisation-emotional support has a great interest in maintaining the learner's motivation and engagement, this support is seen as expressions of empathy and sharing of lived experiences [8] which broadens the discussion and stimulates learners to participate [13]. A specific interest must be paid to the social aspect and their role in creating a positive feeling between the interacting group [2].

3. METHODOLOGICAL ASPECTS

3.1 Description of the training process

The model of the notes of this training made available to us by the managers of the association "FADEEP", only includes the notes obtained by the beneficiaries in different activities (DF, synchronous meeting, tests,..) during the three sequences of the training, we do not have data that can be used to make an analysis taking into account the socio-professional characteristics of the teachers. We will, therefore, use the DF notes to explain their participation. It should be noted that DF note groups the note of several elements (share, collaborate, solve problems, initiate discussion threads).

3.2 The data corpus

The body of data on which we have worked consists, on the one hand, of the scores obtained by learners (N=429) during the DL entitled "communication in the classroom" and more particularly the scores of the DL activity for each week of the six weeks of the DL, and on the other hand, the analysis of the results of 20 interviews conducted with DL actors (learners, tutors, DL officials, DL managers) After completion of the training according to a semi-directive interview protocol, the treatment aims to highlight the impact relationship of learners' active participation in the DF and their success in the DL.

4. RESULTS AND DISCUSSION

Use of DL scores & semi-directive interviews
Distribution of beneficiaries according to their participation in the DF.

Table 1: Distribution of DF averages

		Headcount	Percentage	Validpercentage	Cumulative percentage
Passive	$0 < F < 50$	152	35,1	35,1	35,1
Active	$50 = < F < 90$	205	47,3	47,3	82,4
Very active	$F \geq 90$	76	17,6	17,6	100,0
Total		433	100,0	100,0	

Table 1 shows that 35.1% of the beneficiaries are passive, they have obtained an average ($F < 50$) in the DF (152 beneficiaries), they are passive participants, they only read the posted messages, which confirms the result of the study conducted by (Dip Nandi *et al.*, 2011) who stated that a significant number (60% of participants) in two online courses have not posted any messages on the DF. This passive participation in the DF was explained by a number of interviewees by:

- The attitude and behavior of some tutors as well as the lack of social-emotional aspect
- Indifferent learners harm DF with demotivating and disturbing messages
- Fear of being embarrassed in front of other learners is a factor that reduces participation in the DF
- The set of tasks of the DF (sharing, participation, collaboration...) that the learner is required to perform each week is an additional burden given the professional and family commitments
- The use of secondary means of communication such as Facebook and WhatsApp can reduce participation in DF.

64.9% of beneficiaries had an average ($F \geq 50$) whose active participants represent 47.3%, while those who are very active on the DF and have a score ($F \geq 90$) represent only 17.6%, this result is in line with the study conducted by (SandossBen Abid-Zarrouk, 2012) which states that it is only one quarter of

the participants who send the majority of messages. This under-utilization of the DF could be explained by the fact that participants focus on reading rather than writing messages (only 4% posted one or more times a week)(2), and even when posting on the DF, this could be due to the mandatory nature of participation as a need for help in solving a problem(13).

4.1 Distribution of beneficiaries according to their success in training

Table 2: Distribution of the average scores of the three DL sequences

		Headcount	Percentage	Validpercentage	Cumulative percentage
Failure	$0 < S < 50$	101	23,3	23,3	23,3
SuccessAverage	$50 = < S < 90$	245	56,6	56,6	79,9
StrongSuccess	$S \geq 90$	87	20,1	20,1	100,0
Total		433	100,0	100,0	

The results presented in Table 2 indicate that 23.3% of learners failed in the DL ($0 < S < 50$). The success rate exceeds 76% of all enrolees or a workforce of (332) distributed as follows: 56.6% achieved average success ($50 = < S < 90$) and only 20.1% who achieved strong success ($S \geq 90$).

4.2 Impact of active participation in the DF on the success of a DL

Correlation between participation in the DF and success in the DL.

In order to show the role of the DF on the beneficiary's success in the DL, we will try to highlight the link between the variables, for this, we have crossed the variables "overall DL average" with "DF average".

The correlation between "DF average" and "overall DL average" as mentioned above in table (3) indicates that none of the participants among the Passive in the DF will succeed in achieving the DL with an average $S \geq 90$, which confirms the result obtained in the study by [11] where the authors

showed that only three learners validated the module without being active in the DF other hand, none of the Very Active participants failed in the DL ($S < 50$).

Table 3: Correlation between the overall DL average and the DF average

		0 < F < 50		50 = < F < 90		F > = 90	
		Passive		Active		Very Active	
Failure	0 < S < 50	Headcount	97	4	0	101	
		% in Medium DF	63,8%	2,0%	,0%	23,3%	
Success Average	50 = < S < 90	Headcount	55	171	19	245	
		% in Medium DF	36,2%	83,4%	25,0%	56,6%	
Strong Success	S > = 90	Headcount	0	30	57	87	
		% in Medium DF	,0%	14,6%	75,0%	20,1%	

Total	Headcount	152	205	76	433
	% in Medium DF	100,0%	100,0%	100,0%	100,0%

It can be seen that 75% of the participants who have achieved a strong success in the DL are the most active in the DF. While 63.8% of participants, or 97 beneficiaries among the 101 who did not succeed in the DL are passive in the DF. This result shows the important role of DF in the success of learners. What contributes to the work of a number of studies that have highlighted the positive correlation between success in DL and active participation in the DF [10,11,13]. The study conducted by (B. Olivier, 2016) shows the significant difference between participants who used the DF and those who did not [3].

Table (3) also shows that 36.2% or a headcount of (55 beneficiaries) are passive in the DF and yet they will achieve average success in the DL, this could be explained by the fact that beneficiaries simply read the posted messages without contributing to the DF, a result that corresponds to research that has highlighted that peripheral use or low participation does not hinder success in the DL [2].

4.3 Estimation of the multinomial Logit model

The statistical processing of the data is done through the use of the logit module. The choice of this model is dictated by two major elements:

- Overall, the logit model is not influenced by constraints compared to the probit model. The Logit model is adequate because as shown in the table (3) the dependent variable used is qualitative.
- The dependent variable is multinomial (or polynomial). In our case, the dependent variable (S1) "DL success" admits three modalities 0, 1 and 2 for failure, average success and strong success.

As an illustration, we will present here the detailed results for the first sequence of the first week's DF and the second week's DF. For the other weeks, we will only present the final results.

Table 4: Estimation of model Logit

Dependent Variable: S1				
Method: ML - Ordered Logit (Newton-Raphson / Marquardt steps)				
Included observations: 429				
Number of ordered indicator values: 3				
Variable	Coefficient	Std. Error	z-Statistics	Prob.
M1	0.885243	0.179043	4.944299	0.0000
M2	2.070826	0.244138	8.482184	0.0000
LR statistic	363.1878	Avg. log likelihood		-0.663194
Prob(LR statistic)	0.000000			

In this study, we explain the variable S1, which represents the success rate in sequence 1, by two explanatory variables: the first week DF (M1) and the second week DF (M2), through the Logit model, for 429 individuals. The table(4) above represents the results of the estimation of this model.

- The coefficients are all significantly different from 0 (critical probabilities less than 0.05). The Log likelihood statistic is equal to LR=363.1878 compared to a χ^2 read in the table at a threshold of 0.95% and 2 degrees of freedom, $\chi^2_{0,95;2} = \chi^2_{0,95} ; 2=5,991 < 363.1878 \rightarrow$ rejection of H0 (assumption of nullity of all coefficients in our model). The model is therefore statistically validated. It can, therefore, be concluded that M1 and M2 have a positive effect on S1.
- For the second sequence, the results show that the coefficient of M3 is significantly different from 0 at the 0.05 threshold, while that of M4 is not significant at the 0.05 threshold but at the 0.08 threshold. The Log likelihood statistic is equal to LR=63.94358 compared to a χ^2 read in the table at a threshold of 0.95% and 2 degrees of freedom, $\chi^2_{0,95;2} = \chi^2_{0,95} ; 2=5,991 < 63,94358$. So the results are in favor of rejecting H0. Thus, it can be concluded that the model is statistically validated. It can, therefore, be concluded that M3 and M4 have a positive effect on S2.
- For the third sequence, the coefficients of M5 and M6 all differ significantly from 0 (critical probabilities less than 0.05). The Log likelihood statistic is equal to LR=166.0466 compared to a χ^2 read in the table at a threshold of 0.95% and 2 degrees of freedom, $\chi^2_{0,95;2} = \chi^2_{0,95} ; 2=5,991 < 166,0466$. Similarly, this result shows that we must abandon the H0. The model is therefore statistically validated. It can, therefore, be concluded that M5 and M6 have a positive effect on S3.

5. CONCLUSION

As has already been pointed out in the literature, DF provides a basis for explaining and/or predicting the effective success of a DL. In addition, from this literature, several elements relating to the success or failure factors associated with the DF predict the success or otherwise of a DL. Similarly, we were able to show how criteria can be generated from the study of DF.

The elements taken into consideration were also chosen in terms of our qualitative study which allowed us to limit the elements studied. Our contribution to the study of the relationship between 'participation in DF' and 'success in DL'. Our results attest to the following elements:

- A significant number of teachers are passive participants in DF, they simply read the messages posted on the DF, which constitutes a resource bank for them and that most of the messages come from a small number of teachers and are the most active, this could be due to the fact that the beneficiaries focus on reading the messages rather than writing.
- There is a strong positive relationship between active participation in the DF and success in the DL. In addition, the most active teachers on the DF will achieve a strong success in the DL.
- The LOGIT model clearly shows that the variables Mi (i for 1 to 6) relating to participation in DF have a positive effect on the variables Sj (j for 1 to 3) relating to sequence means.

Our contribution enriches the body of knowledge on the quality of a DL with an approach based on empirical data collected in the Moroccan context. However, our work has some limitations that can be summarized in the following points:

- Small size of the sample size
- Deficiencies related to the lack of information in the database used for the study
- Lack of an observatory dedicated to compiling the different types of information that could describe different factors and variables related to the conduct of a DL, We were able to observe the existence of an observatory entitled "Moroccan Observatory for Training and Research in ICTE(OMaFoR-TICE)". However, it is not specifically dedicated to the DL, it is interested in the integration of ICTE.

In the end, we hope that this study represents a start for a promising field of investigation to study all the criteria and characteristics that could contribute to improving the quality of DL. The quality requirement has become a demand and work in the education and training system in Morocco.

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