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# The Importance of Institutional Challenges in E-Learning Performance

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## Abstract

*Experiences in e-learning are more and more recurrent. However few studies try to go beyond an experimental level and apply the concept to a whole academic class of students. The integration of e-learning in a pedagogical program requires analyzing its performance not only from learners and instructors point of view, but also from the strategic perspective of the institution. The first part of this article presents a literature review from which we propose a theoretical model. In the second part we analyse the case of Montpellier Business School. More than 400 students filled in a questionnaire about their utilisation of the e-learning platform answers were collected. The main result of this paper shows, among other things, the main interest of broadening e-learning performance assessment in order to include upstream objectives of the institution itself.*

**Keywords:** E-Learning, Performance, Learning, Higher studies

## Introduction

The e-learning phenomenon represents one of the most highly developed computer-assisted approaches in education. Since 2002, the gloomy economic climate in which this “new cognitive economy” is taking shape proves (yet again) that the enthusiasm over an innovative concept does not automatically go hand in hand with the expected effectiveness (Pailing, 2002). Consequently, introducing *e-learning* for training purposes reveals a certain ignorance of its own performance. Few scientific works have been published on the subject compared to other areas of application of information systems. This indicates a lack of sufficiently consensual theoretical framework to come to terms with this issue. The contingency of the cases studied or even the newness of the concept could certainly be cited as causes.

The first part of this article presents an analysis of the main scientific publications on which we have built our theoretical model. The second part presents the case of Montpellier Business School where research was carried out on 800 students who had studied abroad for a year while simultaneously continuing studies with their home country institute via an *e-learning* platform. With this practical situation as a basis, this article analyses the factors that explain the system’s performance and then suggests that such an approach is worthy of going beyond simple on-line lesson follow-up to encompass strategic objectives of the institute itself.

## 1. Literature review

### 1.1. The teachers

Introducing e-learning requires the teacher to make major changes and even transform his/her way of teaching (Jean, 2001; Copolla et al., 2002; Godinet & Caron, 2003). Exercises

are no longer tied to the singular space and time frame in which they were confined. Content often provided orally has to be pre-formalized (in writing, audio, video, etc.). A separation of roles between lesson designer, tutors and various experts, means the course design shifts from *handcrafting to mass-production* and from *individual to group*. “Stage plays” combining verbal and non-verbal communications are replaced by more impersonal contacts (if we refer to the richness of media theory in any case).

The pedagogical style also requires a transformation. The teacher moves from the position of holder of knowledge or facilitator in student development to a role of regulator. The aim of the Learner-Teacher interactions is to motivate and stimulate the learners, by enabling them to clarify the concepts presented in the content (Moore, 1989). Therefore, one of the teacher’s roles consists of interacting with the students, to help them overcome difficulties that contact with the content alone, and with other students, has not resolved. Tools such as forums or corrected exercises can be used to assist these interactions. Regular feedback often represents a factor in learner satisfaction with the tool (Northrup, 2002).

In fact this change, from “*Sage on the Stage*” to the “*Guide on the Side*” introduced by Copolla et al., 1997 does not eliminate the various roles that a teacher is supposed to play. Following a series of around twenty interviews, the authors conclude, for example, that “virtual teachers” continue to exercise their cognitive, emotional and even domineering roles. The difference is that they have to develop new behaviour and to use information technologies to communicate some of those signals (via forums, Email, etc.). Therefore, if teachers wish to capitalize on the potential offered by *e-learning*, they need to be used to employ Information Technologies in their courses (Godinet & Caron, 2003).

Similarly for information technologies in an organization (Sproull & al., 1987), all these reasons mean that introducing *e-learning* in an establishment can lead to a form of anxiety and influence the level of motivation. Some experimental researches reveal that the involvement level of the teacher in *e-learning* is a decisive factor in its success (Piccoli et al., 2001; Webster & Hackley, 1997). These conclusions are consistent with the social influence theory related to the use of information technologies (Fulk et al., 1990) according to which behavioural models developed by some are based on behaviour observed by others. The case of *e-learning* appears to make this issue even more striking as teachers and students hold asymmetrical positions and the former are supposed to act as role models for the latter.

## **1.2. The learners**

Teacher characteristics, for all that, would not be enough to predict the motivation and the active behaviour that the students will develop. Going beyond the vigour attached to *e-learning*, we should not neglect the feeling of frustration or isolation that distance learning can have on individuals (Hara & Kling, 2000). The more virtual an organization becomes, the more face-to-face encounters are needed by users (Handy, 1995; Davenport & Pearlson, 1998). Some theories such as “social presence” (Short et al., 1976) were already emphasising the socio-emotional and psychological perception that the players experienced using media rather than a face-to-face discussion. In addition to being motivated for the lesson, students also have to be motivated to learn via the *e-learning* system.

This form of teaching therefore also involves a cultural change for the learners. They have to develop a more active behaviour, to explore knowledge in a more open information space, whereas they had been used to receiving it in the confines of a classroom. They have to interact with content, to appropriate it in order to modify their cognitive structures (Moore, 1989). Even when the students are alone, they have to commit themselves to this type of “internal” dialogue so as to encode and retain information (Berge, 2002). Content can only become knowledge for the student via this active cognition process (Gagné, Yekovich & Yekovich, 1993). Learners therefore have to become highly autonomous, which is more supposed than facilitated by the *e-learning* mechanism. The *e-learning* approach is supposed to provide more freedom to learners, but at the same time they need to be able to discipline

themselves. Even if coaching by teachers seems to be necessary for learning (Piccoli, 2001, p. 8) it seldom allows checking how students organize their work and manage a “virtual timetable” (Arnaud, 2003).

However, even if scientific and professional literature has, at length, dealt with pedagogical models worthy of being adopted in an e-learning activity, we can observe that it has often been without consideration of learning styles. This is probably due to the fact that this characteristic cannot be known beforehand and that there can be as many different learning styles as there are learners. On the other hand, future research on the subject would probably benefit from coming closer to the existing Education Science typologies<sup>1</sup>. So it can be sound to consider that the performance of an *e-learning* tool can also need to make a lesson available into different versions covering the spectrum of learning styles.

### 1.3. The institute

Nevertheless, in literature the institute in which the e-learning activity is developed is rarely considered or is totally excluded in the proposed models. However, the little research done emphasizes the organizational upheavals induced by e-learning as well as the subsequent and compulsory input from the institute (Jean, 2001). As previously highlighted, recorded field studies have mainly been proven experimentally between teachers and learners using a specific technological tool (*all things being equal otherwise*). In an era in which adopting information technologies represents a strategic challenge for schools, in our opinion, it is time to focus deeper the ‘school-related’ variables likely to play a role in the success of an on-line teaching activity.

Theories concerning the use of new technologies evoke the fact that their diffusion level is a factor in their own acceptance. Diffusion is the process by which the technology is extended to other parts of the organization (Goodman & Sproull, 1990). Opportunity is created for others to need this technology and to be aware that others use it. This diffusion is required in order to create a prescriptive general opinion of the new technology. Upheavals in the teaching activity brought about by *e-learning*, mean that its implementation depends on how determined a school is and what means it has available.

Adopting a technology depends on individuals’ determination, but also on how the managers “promote” the idea (Salanick, 1977). Moreover, this is a sort of “value paradox” (Sproull & Hofmeister, 1986): the more the technology is emphasized, the more harshly it will be judged, if the pre-stated aims are not achieved. Adopting a new technology depends also on the symbolism associated with it (Prasad, 1993). The way in which an *e-learning* project is introduced to the players involved will therefore also be an influential variable in terms of the perceived level of success.

On-line learning brings about major changes in the teaching profession requiring much investment for the school. We should in particular mention:

- The incentive system for teachers (teaching dispensations, bonus, etc.).
- Training for teachers and help in designing on-line lessons, multimedia resources, quizzes, student coaching, etc.
- Forming an editorial committee to assess teachers’ work: meeting pre-determined quality criteria, abiding by copyright laws, etc.
- Media team responsible for transforming the resources developed by the teacher (formats: web, flash, audio, video, etc.).
- Technical team responsible for putting the e-learning platform on-line and up-dating it.

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<sup>1</sup> We would have the reader refer to research carried out by Honey & Munford (1992) who distinguish **four** different learning styles: thinkers, activists, theorists and pragmatists

Of course, all these factors determining the success of an e-learning tool, as well as those already presented in this article, are by no means an exhaustive list. The organizational complexity of educational establishments makes it difficult to forecast the success or failure of any given project.

#### 1.4. Success of an e-learning tool

Against this background, research into experimenting such systems (Bieber & al., 2002; Minnion & al., 2002; Coppola & al., 2002; Piccoli & al, 2001; Webster & Hackley, 1997; Hiltz, 1995; Alavi, 1995 & 1994) has focused on the effects induced on learners and teachers in the following ways:

- learner-teacher interactions,
- group exchange between learners themselves,
- cognitive processes and pedagogical models,
- cultural changes,
- experience gained by the teacher and learner.

These experimental methodology-based studies, often conducted on a test group of learners, point out the strengths and weaknesses of these tools to be brought to light - with regard to teaching and learning processes. It shows that the many influencing factors confer a particularly subjective character to the idea learners and teachers may have of it. If the arguments in favour of trying *e-learning* are, initially, with a view to improving the training process, others are interested in the underlying economic and strategic potential for an institute taking up such a project. As such, another perspective is to consider *e-learning* as a way to justify the organization's operating costs (Minnion et al., 2002). If we deem that the knowledge to be transferred to learners and the interactions associated with their understanding can be formalized via a computer-communication process, then the hypothesis of reducing the operating costs of a teaching activity is a legitimate one. All of the following should, at first sight, contribute to reducing the cost of teaching per student and generate savings likely to secure a return on the technological investment: an automated didactic system, self-assessment functions, teachers called on essentially for pedagogical coaching, less classroom space needed due to face-to-face lessons, etc. Some research even associates this reasoning with an emphasis on development or even as a competitive advantage (Webster & Hackley, 2001; Dufner et al., 1999).

The e-learning market nevertheless entered troubled times two years ago. Caution needs to be taken therefore, in terms of how ambitious research should be into the degree of success of such distance teaching tools. The fact that some "e-training centers" have recently gone bankrupt warns us that viability of an economics model based on information technologies should surely first transit by the appropriation and use of these.

So without trying to test the hypothetical impact of e-learning on the reduction in operating costs or the creation of a competitive advantage, we believe it is necessary to take into account the idea of performance from an institute's standpoint. Is it still coherent, in fact, to consider that an organization's investments in information technologies (whatever they are) are suitable only if they form part of a growth strategy (Powell & Dent-Micaleff, 1997)? On the one hand, the return on investments is not always assessable on objective grounds:

- certain costs cannot be accurately measured (for example: the hourly production cost of creating or transforming a lesson),
- contextual changes that can happen, between when the decision is made to invest and when the system actually bears fruit,
- labour regulations as yet do not cater for distance learning (case of the French university system).

On the other hand, the decision to invest may also be motivated by less analytical ambitions in financial terms. For several years now, training centers have been subjected to a certain pressure concerning experimenting with or adopting distance learning systems (Webster & Hackley, 1997; Alavi et al., 1995). Implementing them can therefore aim at promoting a modern image or even avoiding being marginalized in relation to developments in the field. Measuring effectiveness and efficiency as perceived by the institute's management team may also bear fruit in terms of overall success.

## **2. Research field**

Montpellier Business School *e-learning* project was given impetus in early 2001 with the decision to make it compulsory for students following the Schools program to do a year's study abroad. Consequently, at the start of the 2002 academic year, 400 students were dispatched to 130 different foreign partner universities. In addition to the lessons they attended in their host universities, these students had to follow some Montpellier Business School courses<sup>2</sup> via the e-learning platform developed for this purpose. The challenge was to offer students the opportunity to pass two diplomas the same year: to validate their academic year at the host university while at the same time validating their specific course studied on-line required to be accepted on to a year of specialization.

### **2.1. The institution**

The interviews we conducted with the group's management team revealed that *e-learning* was developed here in a bid to open the training program to the rest of the world. In this way, the primary aim was not as much to develop the pedagogical tool as to take full advantage of the distance learning opportunity. The following means were employed to achieve this goal: recruiting a researcher-teacher as person in charge of the e-learning project; employing the services of a computer engineering consultancy firm; training the teachers involved; and implementing an editorial committee (made up of teachers representing the education and research departments) responsible for validating each teacher's work. As an incentive and to give value to the teachers' work, a reduction in their teaching load and other duties was implemented.

### **2.2. The e-learning tool**

Emphasis has been put on an approach and a system affording the greatest possible flexibility to an innovative project the specific needs of which had not been predetermined. Instead of buying an existing ready-made platform, the decision was taken to build a "homemade" one using open-source technologies. Developed by the group's Webmaster, this platform, which is now in its fourth version, offers the same features as a professional product available on the market (content chunking, discussion forum, schedule for work to be done, glossary, quiz, etc.). This choice is justified by the fact that total control over the source code allows changes to be made at any time and specific needs met.

The e-learning platform includes, in particular, a system allowing the teacher to create lesson content on-line him/herself with the same ergonomics and the same functionalities as a conventional word-processor (copy, paste, text layout, inserting pictures or animated objects, etc.). As a result, the teacher theoretically does not need any specific IT skills. And so, there is little point in taking into account the influence of the IT skills mastery variable, as it is presented in this theoretical model, when analysing the data.

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<sup>2</sup> Lessons considered, aside from those taken at the host university, as decisive for the students to be able to follow the curriculum in their school involving a year of specialisation: Finance, Auditing, Information Systems, E-business and Process Management.

### 2.3. The learners

The 400 students were hosted in a 130 partner universities in which they had computer rooms at their disposal allowing them to make full use of the e-learning platform functionalities. Incidentally, the only materials needed for this to take place, was a computer (PC or Mac) connected to the Web via an Internet browser (and perhaps a printer if the student wanted to keep a hard copy of the lessons rather than viewing them in their electronic format). The questions or complaints made by the students (often by Email) were more oriented towards the conditions and difficulties of doing two courses at the same time, as opposed to problems with using Web technologies.

In terms of IT skills, these students could all be considered as having a satisfactory level for using the e-learning tool set up: (1) in their first year of study on the Montpellier campus, they all had about 30 hours of compulsory computer science lessons; (2) by the way, the platform requires no other skill than knowing how to use a Web browser. However, we did not think it was pertinent in this case study to analyse whether the teachers and/or students mastered IT skills. Recent studies show that these factors have a very limited influence on both satisfaction and the resulting marks (Hayashi et al., 2004).

### 2.4. The teachers

The five teachers involved in the school's project taught specific subjects (finance, process management, auditing, information systems, and *e-business*) enabling the students to undertake a year of specialisation upon their return. These lessons were, *a priori*, unlikely to have any equivalent in the 130 partner universities. Furthermore, the teachers for this project were chosen according to their degree of involvement in the group's pedagogical activity. They were entirely responsible for drafting the content of the lessons to be converted to *e-learning* material. To do so, they had to adhere to the following pedagogical model:

- Cut course content up into sessions equivalent to two-hour-long face-to-face lessons.
- Divide each of the sessions into "chapters" or units of learning of no more than 3 screen pages. The standard writing reference to be adhered to, in terms of volume, was 20 A4 pages per session.
- Set the students an internally assessed case study type assignment (in groups of five) covering all the sessions developed.
- Compile the glossary, reference bibliography as well as the links to other recommended websites.
- The work submitted by each teacher was assessed by the "editorial board" before being authorized to go on-line in September 2002.
- The teachers were held by institutional accountability to ensure student coaching. Given the number of students to monitor (400) scattered worldwide in different time zones, asynchronous communication proved to be the most appropriate vehicle for their interaction. It was also important for the school that the chosen system be as user-friendly as possible and not require any specific software to be installed on the 130 host university computers. This is why the use of electronic forums relayed to Email (for any confidential communication) was given preference.

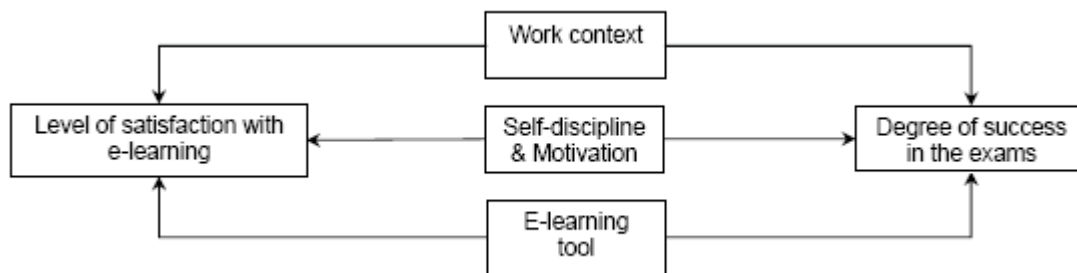
## 3. Methods

### 3.1. Hypothesis and research model

The research conducted also allowed this variable to be broken down in terms of the level of student satisfaction with the on-line learning tool. The idea of *e-learning* effectiveness in our research model (see Figure 1) will consequently combine a relatively objective dimension

(the grade) with a more subjective one related to the degree of satisfaction stated by the student him/herself (see appendix about variable measurements).

Figure 1: Research Model



The characteristics of the case studied have made it pertinent to analyse some variables which supposedly explain the theoretical model presented in the first part. First of all, the student's work context is, to a certain extent, beyond the control of the institution that initiated the project, which means studying its influence becomes interesting. Even though the international department of Montpellier Business School was of course careful to take this parameter into consideration when establishing partnerships, the 130 partner universities worldwide, in all likelihood, represent just as many different work environments (measured in our research by: the available IT resources, the student's free time as well as the work conditions) likely to affect how these learners perceive working on-line.

- H1: The effectiveness of e-learning is explained by the work context of the students in their host university.  
 H1.1: The degree of satisfaction with e-learning is explained by the work context of the students in their host university.  
 H1.2: Exam success through e-learning is explained by the work context of the students in their host university.

Moreover, the fact the students had to combine the on-line lessons from their French business school with those from their host university (taught in the local language, in a different cultural context and according to its own pedagogical methods) makes it interesting to examine the importance of variables tied to motivation on the one hand, and self-discipline on the other hand (measured in our research by the frequency of use of the platform, their own time management).

- H2: The effectiveness of e-learning is explained by the students' self-discipline and motivation.  
 H2.1: The degree of satisfaction with e-learning is explained by the students' self-discipline and motivation.  
 H2.2: Exam success through e-learning is explained by the students' self-discipline and motivation.

We could not carry out research on a subject like this without evaluating the students' impressions of the distance learning tool itself. To do this, we measured on the one hand the students' perception of pedagogical quality of the course created and presented by the teachers (quality of the content, work requested, exchange with the teacher and the other students via the platform) and, on the other hand, the interest of these on-line lessons within the framework of the overseas curriculum.

- H3: The effectiveness of e-learning is explained by the e-learning tool set up for that purpose.  
 H3.1: The degree of satisfaction with e-learning is explained by the e-learning tool set up for that purpose.  
 H3.2: Exam success through e-learning is explained by the e-learning tool set up for that purpose.



### 3.2. Sample

Given the large number of individuals involved (800 students), a questionnaire was the only feasible methodological path to take. Due to the research subject, and so as to obtain the highest possible response rate and data processing effectiveness, we opted for an on-line questionnaire directly administered from the e-learning platform. In June 2004, by means of their own work tool, the following students were called on: the 400 enrolled for the 2002-2003 academic year, as well as the 400 in the new 2003-2004 promotion (still abroad at the time of the survey). A reminder sent out at the beginning of July by the ESC Montpellier's management team was all it took to obtain a response rate over 50% less than a month after the questionnaire was launched (181 students of 2002-2003, 224 of 2003-2004 class).

### 4. Results and Discussion

The first step consisted of establishing a factorial analysis<sup>3</sup> (see Table 1) as to validate our research model structuring in relation to variables measured by the questionnaire (see appendix about variable measurements).

Table 1: Characteristics of the factorial analysis

COMPONENTS MATRICE <sup>4</sup>	Factors		
	1	2	3
E-learning frequency of use	<b>0.759</b>	0.075	-0.063
Period at the beginning of e-learning monitoring	<b>0.792</b>	0.083	0.032
Motivation towards e-learning	<b>0.646</b>	0.083	0.445
Free time in the host university	0.079	<b>0.839</b>	0.049
Work conditions in the host university	0.101	<b>0.823</b>	0.117
Perceived quality of the on-line course	0.088	0.203	<b>0.710</b>
Perceived interest in the on-line course	-0.009	-0.029	<b>0.814</b>

The values in bold in the components matrix above highlight the factors on which each of the variables is the most closely represented. Thus:

- Axis 1 basically represents the variables related to the student's self-discipline and motivation.
- Axis 2 is more to do with the student's work environment.
- Axis 3 refers to the e-learning tool itself and to how useful the student perceives it.

This consistency between our research model's structuring variables and the data collected by the questionnaire, therefore enable us to test the explanatory value of each of these factors in terms of (1) the degree of student satisfaction with e-learning and (2) their on-line course exam results.

<sup>3</sup> Method: Main component analysis; Barlett sphericity test: Chi-two; approx: 286,613; Significance: 0,000; Factorial analysis method: Regression; Rotation method: Varimax; maximum turn around number: 25; Condition for extracting actors: Eigenvalue > 1; Number of retained axes: 3; Total variance explained: 64%

<sup>4</sup> Components matrix after rotation using the Varimax method

In terms of the degree of satisfaction experienced by the students towards e-learning, the most statistically significant variables (significance threshold less than 0.05) are firstly those related to the e-learning tool<sup>5</sup> itself (co-efficient 0.41), and then those linked to student self-discipline & motivation<sup>6</sup> (co-efficient around 0.1). These results confirm the work done by Hayashi et al., (2004) for whom the teacher interactions, and in a more general way the variables related to the e-learning tool, represent a decisive factor in the lasting use of tool. In the same way, self-discipline, that relies on a change in behaviour, in relation to a traditional pedagogical approach, is an important factor in setting up a distance learning tool and particularly in terms of student satisfaction (Arnaud, 2003).

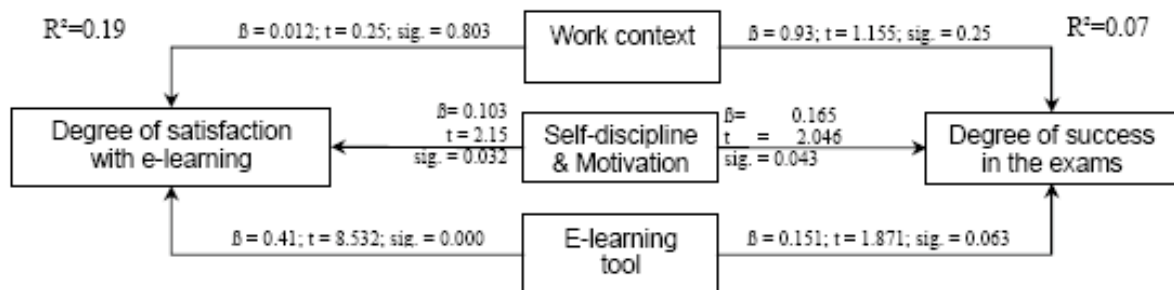
With regard to exam success, the results only allow the influence of homework and learner behaviour to be confirmed. Consequently, the learning assistance medium represented by the e-learning tool in no way changes the fact that the driving force in students' success is their own determination. These results are in line with the most recent research, that first of all emphasise factors such as the students' intelligence or pedagogical coaching (Hayashi et al., 2004).

In a more general way, this data leads us to question the significant importance that the variables related to the students' work environment are supposed to represent. Even if, *a priori*, they unquestionably facilitate or hinder students' work, their influence seems diminished by other more decisive factors (students' motivation, self-discipline, perceived course quality and interest, etc.). Here we agree with other research for which the results of setting up an e-learning tool depend, first and foremost, on the students' motivation as well as a change in behaviour concerning self-discipline (Arnaud, 2003).

At the same time, we cannot neglect that if the model's explanatory part in terms of the degree of satisfaction is nearly 20%, it is only 7% for the second. Even if, via other methodological and scientific approaches, this threshold could be raised, for the moment these results make us put things into perspective: the interest of a lot of contemporary research that, in trying to improve the performance of an on-line learning tool think that student learning will be improved.

Our results here, on the contrary, tend to reveal all the complexity concealed in the learning process (whether it gets IT media coverage or not) and incite us to recall, for example, the central role played by the student's resolute, intellectual and cognitive patterns. As we have introduced it into our research model, we think that in terms of e-learning engineering, elements not merely focused on the teaching process but rather the learning process (learning style in particular) deserve to be taken into account to a greater degree.

Figure 2: Model explaining the exam results via the linear regression method



Without any consideration of this type, in the case of a drop of grades at the exams, we could say that the primary aim of such a tool is not reached. So, shouldn't this observation be put into perspective so to not adopt an approach that might limit the legitimacy of such a

<sup>5</sup> Interest and quality of the on-line course as perceived by the student.

<sup>6</sup> Frequency of use of the platform by the student, time management.

project? The dean of Montpellier Business School considers the *e-learning* project to be successful in so much as setting it up has enabled the group to achieve the set internationalisation goal and to enrol an entire promotion of students in a year's study abroad. In terms of the students: 98% of them consider the year's study abroad to be a value-enhancing element in the career of a student; 95% consider that their year reached this objective; 65% esteem the fact of doing on-line lessons from Montpellier Business School is value-enhancing, and because of this, not delaying their entry in to working life.

The majority of students recognises the legitimacy of the *e-learning* project. Thus, without the possible links of cause and effect being observed in our data analysis, we see that the global performance perception of the on-line teaching tool goes beyond mere lesson follow-up and includes the strategic institutional objectives that gave momentum to the project.

## Conclusion

As with any research work, this article presents limits which at the same time lead to other avenues of research. For example it could be interesting to use other methodologies than questionnaire survey. In the same way, the "newness" of the e-learning concept and its experiments also incites us to perform longitudinal research in order to better analyse over time the learning process related to an innovative pedagogical tool.

The first part of this article endeavoured to enrich the existing scientific theory. Aside from teacher and learner characteristics, this analyse emphasised the importance of also incorporating the institute's objectives in the distance learning project.

The experimental research, presented in the second part reinforces first of all the idea that individual variables (motivation and self-discipline) remain decisive factors in the student's success. Even if environmental variables (conditions of work, available computing resources, etc.) are often put forward in such projects, the case studied shows that their influence on e-learning effectiveness is not significant.

This case illustrates the fact that when learners have to follow and validate a course in another school at the same time, e-learning lessons tend to be neglected. This shows that students still tend to pay more attention to traditional courses than to on-line ones. Thus, in terms of e-learning success modelling, besides variables inherent to the tool itself, this research incites us to include as moderating variable the possible "coexistence" of e-learning courses with traditional teaching. Experimenting e-learning in isolation can give insignificant results about its own effectiveness. Implementing a teaching tool in a straight line has to be analysed in the framework of the pedagogical tool taken as a whole.

Lastly, the objectives sought by the institute show that the legitimacy of an *e-learning* project can be more in the satisfaction of using it to help achieve new strategic challenges rather than in simply improving an existing training tool. Our case study shows that even if there is a drop in the qualitative results in the exams after doing the distance learning course, it is compensated by the fact that this tool allows students to include a year's study abroad in their CV without making their studies any longer. This was confirmed by our student survey: the majority acknowledges the legitimacy of the project. Therefore the success of an e-learning tool should not simply be measured by exam grades, or even student satisfaction. To our opinion, the ability of the institute to develop the potential of a distance learning context and the work opportunities offered to learners deserve to be taken into account.

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## Appendix

### Variable measurement:

	Variables measured	Measurement
E-learning effectiveness	Student success at exam	<i>Counting of grades ranked from 0 to 20</i>
	Student satisfaction level toward e-learning	<i>Measured with the question:</i> Between situations A and B, state bellow your preference level. (A): Existing method: following the 5 e-learning courses during your academic year of study abroad (B): Doing your academic year of study abroad without any other courses than the host university ones. When you are back in Montpellier Business school, following e-learning courses during an extension period of 6 months (without additional registration fees). I prefer A O O O O O O I prefer B
	E-learning frequency of use	<i>Measured with the question:</i> During your academic year of study abroad, on average, you connected yourself to the e-learning platform : <input type="checkbox"/> several times daily (value = 2) <input type="checkbox"/> every day (value = 1) <input type="checkbox"/> every 2 – 3 days (value = -1) <input type="checkbox"/> every week (value = -2) <input type="checkbox"/> no opinion (value = 0)
	Period at the beginning of e-learning monitoring	<i>Measured with the question:</i> Since which period had you begun to follow on-line courses of Montpellier Business School? <input type="checkbox"/> September - October 2002 (value = 5) <input type="checkbox"/> November – December 2002 (value = 4) <input type="checkbox"/> January – February 2003 (value = 3) <input type="checkbox"/> March – April 2003 (value = 2) <input type="checkbox"/> After April 2003 (value = 1) <input type="checkbox"/> No opinion (value = 0)
	Motivation towards e-learning	<i>Measured with the question:</i> With reference to Montpellier Business School e-learning courses, how do you evaluate your motivation level was? (rank from 0 to 20)
	Free time in the host university	<i>Measured with the question:</i> State bellow if the free time in your host university was, for you, rather advantageous or disadvantageous to follow Montpellier Business School e-learning courses: Disadvantageous O O O O O O Advantageous
	Work conditions in the host university	<i>Measured with the question:</i> State bellow if the work conditions in your host university was, for you, rather advantageous or disadvantageous to follow Montpellier Business School e-learning courses: Disadvantageous O O O O O O Advantageous
	Perceived quality of the on-line courses	<i>Aggregated variable calculated with the following questions asked for any of 5 e-learning courses:</i> Content quality: <input type="checkbox"/> Very satisfying <input type="checkbox"/> Satisfying <input type="checkbox"/> Not very satisfying <input type="checkbox"/> Not satisfying <input type="checkbox"/> No opinion Quality of the work to do: <input type="checkbox"/> Very satisfying <input type="checkbox"/> Satisfying <input type="checkbox"/> Not very satisfying <input type="checkbox"/> Not satisfying <input type="checkbox"/> No opinion Quality of communications with the professor (on the forum) <input type="checkbox"/> Very satisfying <input type="checkbox"/> Satisfying <input type="checkbox"/> Not very satisfying <input type="checkbox"/> Not satisfying <input type="checkbox"/> No opinion Quality of communications with other students (on the forum) <input type="checkbox"/> Very satisfying <input type="checkbox"/> Satisfying <input type="checkbox"/> Not very satisfying <input type="checkbox"/> Not satisfying <input type="checkbox"/> No opinion
	Perceived interest in the on-line courses	<i>Aggregated variable calculated with the following question asked for any of 5 e-learning courses:</i> Interest of learning on-line this course: <input type="checkbox"/> Very satisfying <input type="checkbox"/> Satisfying <input type="checkbox"/> Not very satisfying <input type="checkbox"/> Not satisfying <input type="checkbox"/> No opinion