

## **STUDENTS' EXPECTATION AND SATISFACTION IN POST-GRADUATE ONLINE COURSES**

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### **Abstract**

This study explores the relationship between e-learning students' expectations and their level of satisfaction in a Master degree program 2010-2012 developed in a European University. Assuming a quantitative methodology of data collection and analysis, the study was based on student responses to two questionnaires applied at the beginning and at the end of the courses. Both's constructs, expectations and satisfaction, were analysed from a multi-dimensional perspective and nine dimensions were considered: course design, coordination, faculty and tutors; curricular program; resources learning methodologies, evaluation system, support services, and technological infrastructures.

### **Introduction**

The accelerated technology evolution and the social transformation of nations have opened space for new educational paradigms to emerge and make the learning process to be centered on the student. Despite the late inclusion in Portuguese teaching practices, when compared with other countries of the European Union, e-learning practices are increasingly becoming a reality in Higher Education as a growing effort from institutions can be seen in including this modality of learning in their educational offers. However, in Portugal, only 3% of all graduate and postgraduate students are enrolled in e-learning initiatives (Bielschowsky, Laaser, Mason, Sangra, & Hasan, 2009). Despite the increased number of e-learning initiatives, there is still reduced knowledge regarding these experiences from students' perspective (Paechter, Maier, & Macher, 2010) even though, they are the central elements of the educational process.

Many studies have focused on students' drop-out rate and academic success as critical factors on the analysis of e-learning courses effectiveness; however, few have focused on students' general level of satisfaction and even fewer on their previous expectations and how they impact students' evaluation of their level of satisfaction. This study aims to contribute to, reflect on and discuss students' appreciation when enrolling in online courses in higher education institutions. It focuses on the analysis of students' expectations and level of satisfaction in a postgraduate program, developed fully online. The authors expect that the results of this study can contribute to (a) identifying relevant issues regarding e-learning courses quality assurance and (b) reaching a better understanding of e-learning courses benefits from students' point of view.

### **Student Expectation and Satisfaction Analysis**

Similarly to conventional face-to-face classroom teaching, Higher Education Institutions (HEIs) feel the need to evaluate and monitor the processes and results of e-learning initiatives, as a way of improving student retention and increasing courses quality. It is crucial to know which factors influence student expectation and satisfaction in distance learning or web-based learning, because they can be used as regulatory indicators of the adequacy of the course design and the fitness of the virtual learning environment. They can also help identify effective strategies and services for students' online support. (Palmer & Holt, 2008). For the present study the following definition of satisfaction was adopted: "satisfaction is the state felt by a person who has experienced a performance or outcome that has fulfilled his or her expectations. Satisfaction is thus a function of relative levels of expectation and perceived performance" (Kotler & Clarke, 1987, p.72). With regard to expectations, the authors consider that they "are formed on the basis of past experiences with the same or similar situations, statements made by friends and other associates, and statements made by the supplying organization" (p.72).

### **Relevant Factors of Expectation and Satisfaction in E-learning Courses**

Based on a meta-analysis of the recently published literature in the area of e-learning the following elements were identified by Johnston, Killion, and Oomen (2005) as playing a central role in student satisfaction: flexibility, contact and interaction with the instructor, feedback, clarity and adequacy of content, simplicity of access to resources, technological self-efficacy, technical support and student guidance. Palmer and Holt (2008) also emphasize the importance of aspects such as (a) students levels of confidence in their ability to communicate and learn online, (b) students clear understanding of the course requirements, and (c) students access to guidance.

More recently, Paechter et al. (2010) show that instructors' professional competences, ICT-related skills but also interpersonal communication skills, are also quite significant. The level of knowledge of the instructor, his/her role as a facilitator and his/her ability to support and give advice to students, stood out as main factors of influence of students' satisfaction. The authors also concluded that the highest expectations were related to the learning goals of students. Some characteristics of course design were also pointed out: opportunities of conducting collaborative learning activities and the explicitness of the course structure. In the opposite direction, the lack of quality in the feedback obtained on online assignments was frequently indicated as a factor that negatively influences student satisfaction in online courses. In research focused on the association between online instructors practices and student satisfaction it was possible to find significant correlations between students high level of satisfaction and (in a decreasing order of relevancy), instructors' enthusiasm, clarity of expectations, the online activities proposed, the social climate created, the level of instructor

proficiency towards technology, as well as instructor support towards students learning (Eom et al., 2006; Palmer & Holt, 2008).

Infrastructures and technological aspects, such as the website or learning management system that supports the e-learning courses (usability interface, easiness to access as well as an adequate technical support) are also factors that influence student expectations in online learning (Bolliger & Martindale, 2004; Malik, 2009). If guaranteed they can have an enabling power, but if overlooked they will act as critical barriers.

### **Justification for the Research and Research Goals**

There is remarkable growth in the number of HEIs that invest in the development and implementations of e-learning projects. In the European context, there is still a gap in evaluation studies that identify the advantages of a e-learning courses, both on teaching and learning methods, through students' point of view, and more specifically, studies that try to add some knowledge regarding the understanding of how student expectation and satisfaction can be achieved in online programs. Research in this field that assumes students' point of view is still scarce.

However, there are recent international studies that evaluate student expectation and satisfaction in online courses in relation to different dimensions of quality analysis (Bolliger & Martindale, 2004; Malik, 2009; Paechter et al., 2010). These studies allow the identification of different factors that influence the involvement level of students in e-learning courses, indicating their effects on learning. With the aim of contributing to the growth of knowledge in this area, this study assumes the following goals: (a) to know the reasons by which students often opt for a online program in detriment of the classic face-to-face courses, (b) to measure levels of students 'expectations regarding the e-learning program, (c) to analyze student satisfaction at a general level as well as related to specific indicators regarding the course, (d) to understand how different dimensions of the course relates to one another, and (e) to identify the main strengths and weaknesses of the course indicated by the students and therefore establish guidelines for its general improvement.

### **Method**

This research assumes a quantitative methodology, and can be classified as a descriptive-correlational study, focusing on the understanding of selected phenomena, with particular emphasis on the objectivity of procedures and quantification of measurable variables. The online questionnaire was the technical procedure used for data collection. The research design involved three distinct moments: (a) data collection about student expectations before the beginning of the course, (b) data collection about student satisfaction levels, and (c) comparative analysis of the previous moments<sup>1</sup>. This article focuses on the first and second moment of the investigation. Students' level of expectation and satisfaction were analysed considering the dimensions described in Table 1. These dimensions emerged from the 'Framework for quality analysis of online learning'

developed by E-learning Lab UL to guide the design of e-learning courses in University of Lisbon. The same dimensions identified in the framework were used to construct the questionnaire for scoring students level of expectation and satisfaction.

Table 1

*Dimensions and Indicators of Analysis of E-learning Course*

D1. Course design: course general structure and organization	
<ul style="list-style-type: none"> <li>▪ Articulation and coherence of the course design</li> <li>▪ Relevance to current times and innovative aspect of the study plan</li> <li>▪ Clarity in the definition of the curricular goals of the course</li> <li>▪ Adequacy of the work strategies proposed for the course goals</li> <li>▪ Adequacy of the online material and resources used</li> <li>▪ Congruence between different curricular units</li> </ul>	<ul style="list-style-type: none"> <li>▪ Promoting of development of different types of competences</li> <li>▪ Adequacy of the technology and platform used</li> <li>▪ Workload adequacy</li> <li>▪ Administrative, technical and pedagogical support mechanisms</li> <li>▪ Involvement and sense of community promoted among students</li> <li>▪ Attention to ethical and legal aspects</li> </ul>
D2. Coordination: tasks and responsibilities of the course coordination	
<ul style="list-style-type: none"> <li>▪ Clear requirements in students selection</li> <li>▪ Selection process of students for the course</li> <li>▪ Adequate level of coordination between teachers, tutors and other professionals involved</li> <li>▪ Promoting of interdisciplinary and articulation of content</li> <li>▪ Guidance and support to students in matters of course development and online platform organization</li> </ul>	<ul style="list-style-type: none"> <li>▪ Clarification of general doubts about academic and administrative aspects of the course</li> <li>▪ Mediation between students and academic services</li> <li>▪ Dissemination of relevant information and general events</li> <li>▪ Solving of critical situations identified throughout the course</li> </ul>
D3. Faculty and tutors: different abilities, actions and strategies chosen by the teachers and tutors in the development and implementation of the course	
<ul style="list-style-type: none"> <li>▪ Access and approachability</li> <li>▪ Faculty scientific and academic mastery of topics</li> <li>▪ Degree of proficiency in the use of the LMS platform and other online communication systems.</li> <li>▪ Active use of the platform and of other online applications and tools</li> <li>▪ Coherence and explicitly in the definition of goals, timeframes and learning tasks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tutors ability to adapt to specific learning styles</li> <li>▪ Ability to stimulate and moderate online participation</li> <li>▪ Concern with student guidance, feedback and improvement suggestions</li> <li>▪ Encouragement and guidance in online discussion and sharing of ideas</li> <li>▪ Clarification of doubts and effective response to students' needs</li> </ul>
D4. Curricular program: programmatic content of each curricular unit of the course	
<ul style="list-style-type: none"> <li>▪ Logical sequence and organization of course content</li> <li>▪ Adequacy of curricular content to the course goals</li> <li>▪ Modular organization of topics</li> <li>▪ Relevant and updated content</li> <li>▪ Interest of the selected topics</li> </ul>	<ul style="list-style-type: none"> <li>▪ Easiness of access to curricular content</li> <li>▪ Broad range of content addressed in different curricular units</li> <li>▪ Content adjusted to online learning</li> <li>▪ Applicability and relevance of content to students professional practice</li> </ul>
D5. Resources: quality, interest and applicability of the materials selected to the course	

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|---|---|
| ▪ Didactic and curricular coherence of the resources and activities proposed  | ▪ Visual appeal and interest of the resources         |
| ▪ Graphic richness of the resources   | ▪ Usefulness resources                                |
| ▪ Resources diversity of formats  | ▪ Access to the resources                             |
| ▪ Interactivity of the resources  | ▪ Easiness of navigability through the resources      |
| ▪ Accessibility (respect for regulations concerning students with special educational needs and/or technical limitations) | ▪ Resources relevancy to current times                |
|   | ▪ Ethical and legal concerns regarding resources used |
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D6. Learning methodologies: learning methods, task and assignments used to cover the different content considered in each curricular units

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| ▪ Adjusted distribution of time for task completion              | ▪ Clarity and objectivity of tasks and assignment                                    |
| ▪ Frequency and duration of synchronous online sessions          | ▪ Selection of methodologies that facilitate learning                                |
| ▪ Establishment of rules and guidelines for online participation | ▪ Practical applicability and usefulness of assignments                              |
| ▪ Encouragement of research-skills development                   | ▪ Clear information of the deadlines and time requirements for tasks and assignments |
| ▪ Encouragement of digital literacy development                  | ▪ Stimulation of online interaction amongst students                                 |
| ▪ Stimulation of online interaction between faculty and students | ▪ Adequate diversity of learning methodologies                                       |
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D7. Evaluation system: adequacy of the evaluation methods and motorization strategies of the progression of students' learning

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| ▪ Use of different evaluation methods (diagnostic, formative, summative and self-assessment) | ▪ Existing assessment system (general and alternative)    |
| ▪ Availability of self-regulation mechanisms   | ▪ Evaluation criteria                                     |
| ▪ Flexible and adequate assessment moments   | ▪ Adequacy of assessment regarding methods course's goals |
| ▪ Timely and adjusted feedback   | ▪ Clear definition of assessment elements and processes   |
| ▪ Coherence in the forms of assessment between different curricular units                    |   |
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D8. Support services: services implemented to support students regarding technical and administrative academic needs

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| ▪ Efficiency in registration and payment processes                                    | ▪ Access to technical services   |
| ▪ Articulation between the different sources of information (website, platform, etc.) | ▪ Access to learning support services  |
| ▪ Access to academic services   | ▪ Centralization of services that maintain the technological infrastructures |
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D9. Technological infrastructures: learning management system used reliability to support the course

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| ▪ Diversity of the functionalities available on LMS                            | ▪ Flexibility and interactivity of the LMS  |
| ▪ Integration of <i>Web tools 2.0</i>  | ▪ Adequacy of the chosen technological systems and applications                           |
| ▪ Use of online synchronous communication systems provided by the University   | ▪ Usability and intuitiveness of the LMS interface  |
| ▪ Availability of tutorials  | ▪ Speed of the access to LMS  |
| ▪ Use of other synchronous and asynchronous communication systems (e.g. Skype) | ▪ Stability, reliability and robustness of the LMS  |
| ▪ Respect of general accessibility requirements                                | ▪ Quality of the LMS in the management of activities an resources within curricular units |
| ▪ Respect for ethical and legal issues   | ▪ Appearance of the online spaces (LMS)   |
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**Participants**

The participants of this study are the group of students who attended the first e-learning postgraduate program in the University of Lisbon, a Masters degree in Education – ICT and Education specialization, which began in the academic year of 2010-2011 in the Institute of Education. Initially, 33 students participated (N=33), and at the final part of the study, 31 students remained. Of the 33 initial participants, 23 were female and 10 male. Their ages varied between 28 and 55 years, and they were geographically spread over the 12 districts of the country; all of them had Portuguese nationality. About 39% of the participants had no prior experience in e-learning courses, and 33.3% had previously participated in e-learning initiatives as students.

**Instruments**

The 9 dimensions and the indicators shown in Table 1 were used to construct the questionnaires developed for scoring students’ level of expectation (first moment of data collection) and for scoring students’ level of satisfaction (second moment of data collection). Both emerged for the framework used to guide the development of e-learning courses in University of Lisbon, which was developed by E-learning Lab UL<sup>2</sup>

The first questionnaire presented online to students (expectations questionnaire) was supported by Polldaddy and the second (satisfaction questionnaire) was supported by LimeSurvey and both was integrated in the University’s LMS (Moodle). The expectation questionnaire was constituted by 6 questions organized in two different groups. The first group of questions intends to establish students’ profiles and to know the reasons why students attend the course. The second group of questions intends to know the level of students’ expectations regarding the 9 dimensions previously presented. Items assumed a 7-point Likert format (1 – ‘Poorly expectations’ and 7 – ‘Highly expectations’). The 93 items also organized in 9 dimensions constituted the satisfaction questionnaire. Items assumed a 5-point Likert format (5 – ‘Highly satisfied’ and 1 – ‘Poorly satisfied’). The instrument was previously submitted to validation procedures. It involved the expertise of three specialists who reviewed the instrument. Internal consistency analysis, Cronbach’s Alpha was also considerate. Both the global student satisfaction score (93 items) and the general satisfaction score (9 items) revealed high levels of consistency ( $r=.991$ ;  $r=.958$ ).

**Results**

Data collected from the answers of 33 students (first moment of data collection) revealed favorable levels of expectation regarding each of the 9 dimensions.

Table 2

*Overall Mean Level of Students’ Expectation*

N=33	Min.	Max.	Mean	Standard Deviation
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Total Score	3.56	7.00	<b>6.06</b>	0.92
D1 (course design)	0	7	5.55	1.73
D2 (coordination)	4	7	6.30	.88
D3 (faculty and tutors)	0	7	6.27	1.42
D4 (curricular program)	0	7	6.12	1.41
D5 (resources)	4	7	6.36	.78
D6 (learning methodologies)	0	7	6.12	1.50
D7 (evaluation system)	0	7	5.64	2.07
D8 (support services)	4	7	6.12	.93
D9 (technological infrastructures)	4	7	6.06	.93

By analyzing each of the dimensions it is possible to verify that the mean values registered suggest a high level of students' expectation. All these dimensions had mean values above 6, which indicate that students had levels of expectations "too high." The mean levels of expectations in all aspects of the course in analysis values ranged from representatives of expectations "high" and "very high." The lowest mean value (but still moderate – 5.55) corresponds to the 'course design' dimension. In contrast, the 'resources' dimension scored the highest.

The first questionnaire also aimed to know the reasons that led students' choice of enrolling in the online Masters course. Content analysis of the 32 responses highlighted reasons associated with the 'flexibility of space' (with an incidence level of 14) and 'time flexibility'. The 'compatibility with work' and 'family life responsibilities' were also reported as major reasons for why students opt for a online course, with incidence rates of 11 and 4, respectively. Also the 'interest in the area' of the course, the 'investment on professional development' and 'need to develop ICT skills', as well as the possibility of applying digital skills in professional contexts were some of the reasons given by students, although with a more moderate level of impact (4). Also listed, but with lower incidence (1) were the following reasons: 'participation in a different learning experience', 'curiosity about the functioning of online courses', and 'autonomy in learning'. Data collected from the answers of 31 students, on the second stage of data collection, reveals favorable levels of satisfaction regarding the global evaluation of the course and each of its nine dimensions (Table 3). Results show that students were satisfied with the development of the course in all dimensions.

Table 3

*Students' Satisfaction Descriptive Statistic Dimensions*

N=31	Min.	Max.	Mean	Standard Deviation
Total Score	1.34	4.73	<b>3.71</b>	.729
D1 (course design)	1.25	4.75	3.64	.79
D2 (coordination)	1.56	4.89	3.66	.78

D3 (faculty and tutors)	1.40	5.00	3.90	.81
D4 (curricular program)	1.33	5.00	3.95	.82
D5 (resources)	1.27	5.00	3.87	.79
D6 (learning methodologies)	1.25	4.83	3.66	.80
D7 (evaluation system)	1.44	4.89	3.69	.76
D8 (support services)	1.00	5.00	3.11	.98
D9 (technological infrastructures)	1.53	5.00	3.92	.80

By analyzing each of the dimensions it is possible to verify that the mean values registered suggest a moderate to high level of students' satisfaction. The lowest mean value (but still moderate) corresponds to the 'support services' dimension, which shows that students evidenced lower levels of satisfaction when questioned about the way technical problems and academic issues have been solved by the services. In this particular dimension, the indicator with the lowest mean was 'centralization of services that maintain the technological infrastructures'. In contrast, the 'curricular program' dimension scored the highest mean showing that students were highly satisfied with the organization of the curricular program and with the different content covered by each curricular unit of the course. Observing the general evaluation of all the dimensions, the students continue to express an inferior degree of satisfaction regarding 'support services'. The dimension where their level of satisfaction was highest is 'faculty and tutors'. Students favourably evaluated their actions and strategies in the development and management of curricular units as well as their online teaching competences (Table 4).

Table 4

*Students' Satisfaction – Descriptive Statistic General Dimensions*

N=31	Min.	Max.	Mean	Sd. ( $\sigma$ )
<b>Score Total</b>	<b>1.11</b>	<b>5.00</b>	<b>3.77</b>	<b>.809</b>
D1 General (course design)	1	5	3.81	.91
D2 General (coordination)	2	5	3.71	.90
D3 General (faculty and tutors)	1	5	4.03	.91
D4 General (curricular program)	1	5	3.90	.94
D5 General (resources)	1	5	4.00	.97
D6 General (learning methodologies)	1	5	3.77	.92
D7 General (evaluation system)	1	5	3.74	.86
D8 General (support services)	1	5	3.10	1.08
D9 General (technological infrastructures)	1	5	3.87	.92

In addition to this information, participants also reinforced the importance of having access to regular and timely feedback from teachers/tutors, showing that for promoting students' satisfaction in online courses it is necessary to continue to



invest in the improvement of online moderation strategies, with a particular emphasis on the quality and regularity of the feedback provided to students. When the feedback of online tasks is not prompt, structured with adequate comments, practical and individually designed in a way that encourages participation, a negative influence can arise in student satisfaction (Palmer & Holt, 2008; Eom et al., 2006).

From the 93 indicators that constitute the dimensions analysed, it was also possible to identify the indicators that present the lowest and highest levels of satisfaction. Students showed the lowest levels of satisfaction towards the ‘Adjusted distribution of time for task completion’ indicator (present at ‘learning methodologies’ dimension). The course’ workload is described by students as a limiting factor, influencing their performance in a non-productive way. Students’ answers evidenced that there were an excessive number of curricular units occurring simultaneously, mostly during the second semester. Overload is incompatible with most of the online student’s lives as they are fulltime working-students. This aspect is highlighted as an area of further improvements. A balance between time available and student workload must be successfully achieved. By trying to understand how the different dimensions of the course associate with each other a correlational analysis was conducted considering students’ levels of satisfaction (Table 5).

Table 5

*Correlation Analysis*

<i>r</i>	D2	D3	D4	D5	D6	D7	D8	D9
D1	.85**	.81**	.84**	.78**	.84**	.84**	.62**	.85**
D2		.81**	.79**	.67**	.85**	.77**	.68**	.84**
D3			.89**	.81**	.93**	.81**	.64**	.89**
D4				.91**	.88**	.78**	.50**	.88**
D5					.78**	.75**	.39*	.85**
D6						.87**	.72**	.91**
D7							.63**	.86**
D8								.69**

(\*correlation is significant at the  $\alpha = 0.05$ ; \*\*correlation is significant at the  $\alpha = 0.01$ )

It was possible to conclude that the different dimensions present strong and positive correlation with each other. This also evidences a good consistency of the instrument. One of the most strong and significant correlations was found between the ‘curricular program’ dimension and the ‘resources’ dimension ( $r=.91$ ;  $p=.001$ ), which makes it possible to conclude that there is a connection between the curricular organization of the program and the quality, interest and applicability of the materials used to support the selected contents. The ‘learning methodologies’ dimension also presents a significant correlation with

‘coordination’ ( $r=.85$ ;  $p=.001$ ), ‘faculty and tutors’ ( $r=.93$ ;  $p=.001$ ), ‘evaluation systems’ dimensions ( $r=.87$ ;  $p=.001$ ) and ‘infra-structure’ dimension ( $r=.91$ ;  $p=.001$ ). This makes it possible to conclude that e-learning methodologies play a leading role in online courses, promoting learning quality, student involvement in activities and acknowledgement of this specific context. Highly significant correlations were also found between infra-structures and support systems ( $r=.86$ ;  $p=.001$ ).

### Conclusions

From the previously reported results it is possible to derive relevant implications and practical contributions that can be considered for elevating the quality of e-learning initiatives in Higher Education Institution. One of the most relevant conclusions, of the study is the high level of student expectations regarding the course. The students showed higher expectations for the ‘resources’ dimension, which reinforces the need to focusing on providing simple, useful, diverse and attractive materials and simultaneously with rich graphics and interactivity. In an online course, resources should have these characteristics and should ensure legal and ethical issues associated with their use. Good quality resources can promote greater involvement of students in e-learning courses, contributing to the success of their learning, satisfaction and academic results. Another relevant conclusion is the high level of student satisfaction regarding the course attended, not only in a global perspective of analysis but also in a descriptive approach where 9 dimensions were distinguished. This general level of satisfaction with e-learning initiatives can be seen as a good premonition for the future of web-based online learning initiatives in higher education, more specifically in post-graduate degrees. This is indicative of a possible growing level of student involvement in these specific approaches to learning.

The students were mostly satisfied with the ‘curricular program’ and ‘faculty and tutors’ dimensions and specifically with indicators as ‘easiness of access to content’ (‘curricular program’ dimension) and ‘ethical and legal concerns regarding resources used’ (‘resources’ dimension). Previous research in the e-learning domain (Johnston et al., 2005) has already highlighted the importance of the curricular program contents and its clarity as one of the most important factors in student satisfaction in e-learning initiatives. Online students tend to select e-learning courses that prove to fit their learning needs. Therefore the contents and the topics that will be covered in a specific online course need to be as transparent, explicit and concrete as possible. This can stimulate the course attractiveness as well as promote a higher level of adjustment of students’ expectations and consequently a higher level of students’ satisfaction.

The role of teachers and tutors, their online teaching competences, approachability and adaptability to students’ learning styles was one of the critical factors evidenced by this study. The quality of staff is essential in the development of any educational initiative. It contributes in a significant manner to student achievement and satisfaction and online courses are no exception --quite

the opposite (Eom et al., 2006; Lee et al., 2011; Malik, 2009; Paechter et al., 2010). In online learning faculties and tutors are symbols of the institution; few contacts are conducted between the higher education institutions and the students that aren't mediated by faculties or tutors.

In contrast, the 'Support services' dimension revealed to be the aspect that revealed the lowest level of student satisfaction, with 'Centralization of services that maintain the technological infrastructures' ('Support services' dimension) and 'Adjusted distribution of time for task completion' ('learning methodologies' dimension) being the indicators with the lowest satisfaction levels. This shows that before undertaking e-learning initiatives, HEIs need to guarantee that all the required support systems (technical, administrative and academics) are ready to effectively respond to online students' needs. In this study results showed that is essential to improve the support services. Procedures that enable services to function efficiently with each other in a more articulated way need to be implemented.

This study contributes to a clearer understanding of the impact of the distinct dimensions of e-learning courses in students' satisfaction, at the same time it allows a detailed analysis of the specific role undertaken by each dimension, also keeping in mind the articulation between them. It shows that the role undertaken by each particular dimension needs to be seen through its direct effect on student satisfaction, but also by its meditative or indirect effect, supported by the significant correlations found between different dimensions. The results reinforce the importance of an integrated approach in the analysis of the different dimensions. E-learning courses might benefit from being seen through a multidimensional perspective.

It is essential to emphasize the importance of taking into account the dimensions and indicators with the highest levels of expectation and satisfaction, because they have the power of promoting even higher sense of satisfaction and, at the same time, can minimize the effect of dissatisfaction factors. The quality of faculty and tutors, the suitability of resources and curricular program can be valued. At the same time it is necessary to invest in the improvement of the dimensions and indicators with the lowest levels of student satisfaction, in this case, support services.

The opinions and suggestions given by students are useful as they call for attention to the aspects that need to be reviewed and whose quality should be improved. That is the case of student feedback and appropriate workload. Therefore, an investment on technical and academic support services and a more articulated work between curricular units need to be developed. This study helped characterize the different dimensions of an e-learning course that needs to be considered. This dimensions and indicators are seen as quite useful for quality assurance process regarding e-learning initiatives in HEI. Therefore, this study supported the construction of a guiding framework for e-learning courses.

Today's quality assurance systems, by which HEIs need to regulate the quality of their educational offer (Auvinen & Ehlers, 2009), assume that the evaluation of results of any course need to be used for the continual improvement of online or face-to-face courses (Chapman & Henderson, 2010).

### Notes

1. For more information see Lemos, S. (2011). Análise da satisfação de estudantes num curso em e-learning no ensino superior. Universidade de Lisboa. ([http://repositorio.ul.pt/bitstream/10451/4413/1/ulfpie039557\\_tm.pdf](http://repositorio.ul.pt/bitstream/10451/4413/1/ulfpie039557_tm.pdf))
2. More information in <http://elearninglab.ul.pt/>

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