

Quality in virtual education environments

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Abstract

The emergence of the Internet has changed the way we teach and learn. This paper provides a general overview of the state of the quality of virtual education environments. First of all, some problems with the quality criteria applied in this field and the need to develop quality seals are presented. Likewise, the dimensions and subdimensions of an empirical instrument to improve and assess the quality of online education are examined. This tool has already been applied to several educational contexts; though not definitive, it aims to improve not only specific areas, but also the whole educational approach as a system.

Introduction

The enormous proliferation of technology-based distance learning programmes and courses requires rigorous selection through the analysis of the quality of the different educational proposals on offer in society. Often the term quality is fragile and empty of meaning, but we defend quality based not on structural and organisational topics but in terms of academic achievements, that is, the knowledge-building process experienced by the student. The knowledge gained from a training institution is the main result of an educational process and its quality must assure this. In our opinion, quality should follow the constructivist principles in an integrated way, teaching students and providing them with more independence in terms of the learning (Garrison and Anderson, 2003). The rush of educational institutions to offer Internet-based courses for distance education raises some very interesting issues concerning their quality. The promise of distance education through virtual environments being able to provide high quality education has yet to be realised.

On the one hand, from a practical point of view, virtual education environments are very interesting for those people who want to study throughout their lives, as it is possible to learn whenever and wherever you wish. On the other hand, from an educational point of view, virtual education environments are failing to meet the promises made, as they focus on: (a) the prevalence of technological and aesthetic criteria over educational criteria, which should be the goal of any educational action in a virtual context (eg, in the case of hypertexts that do not promote knowledge, but instead an erratic path for students); (b) the confusion between the mere supply of information and actual training processes (knowledge-building processes); and (c) a dominant superficial attitude in many virtual education proposals, resulting from the two aforementioned factors, but not only from these.

In short, few educational principles are actually being implemented to improve the courses. Obviously, we recognise the enormous potential that telecommunications technologies offer for expanding education but we cannot be sure about the quality. There is still a relatively limited body of research evaluating the effectiveness of online learning (Petracchi and Patchner, 2001) and some contradictions have emerged (Harvey, 2002; Sims *et al*, 2002). One of the main causes in the failure to evaluate the quality is the methods used to measure it in these virtual environments (for a brief review consult Gunawardena *et al*, 2000). Another problem leading to the lack of validity is in terms of the locations where the quality of education is being assessed (Gosling and D'Andrea, 2001).

Quality seals

In this context, we agree that in the future, the main role of the Web will consist neither of offering web pages full of information nor offering varied educational proposals, but in establishing filters that ensure that these proposals are reliable and worthy (Kirkwood, 1998; Tretin, 2000). The task (beyond the current generalised proliferation) will be to select and specialise, with detail and personalisation, backed by educational quality seals. These seals will have to be socially recognised by competent bodies, and as has happened in attendance-based contexts, organisations, both public and private, will appear to evaluate whether the job has been done well enough so that higher levels of reliability can be offered to users. This reality is imminent, although it will be difficult to assimilate given the complexity in organising the means currently available.

These organisations will be evaluation bodies that determine the educational quality on offer through technological media, and on the Web in particular, but also in educational television, satellite videoconferences, and in short, technology as a whole. These evaluations will not only yield results obtained from the application of instruments for data capture and analysis, but they will also offer judgements and their conclusions will have to be communicated or conveniently publicised for educational purposes. This is required due to the fact that the use of the results of these evaluations may be multiple. One example would be, and this is not the worst-case scenario, to offer

an external ranking (of premium educational centres) or an internal ranking (eg, of instructors). As has been said above, this process will have to serve, primarily, to review training methods in virtual contexts, and hence, implies a process of reflection on educational proposals (Garrison and Shale, 1987).

There are, obviously, standards to evaluate learning environments for online courses (Oliver and Reeves, 1996; Reeves, 1994; Little and Banega, 1999) but, in our opinion, they are normally based on partial proposals or varying levels of quality (eg, CSU, 2002; IDE, 1999; Frydenberg, 2002), which do not help in viewing the whole system as an integrated reality.

To proceed to make institutions and teachers aware, we also wish to highlight certain other errors relating to the quality criteria used, which do not help the introduction of evaluation proposals for virtual environments. Knowledge of these will ensure we bear them in mind in the search for quality in virtual education.

Errors in quality criteria

Below are certain errors in the application of quality criteria in virtual contexts that can enlighten us for future proposals.

The first consists of the almost exact reproduction of business quality models for education; neither the form nor the content of these models can be translated to educational environments in the way they have been (not to mention the results). Total quality models (TQ and EFQM [European Foundation Quality Management], among others), based more on management than teaching and learning processes, are applied to attendance-based education. These models are beginning to be applied to distance education without the necessary reflection, simply translating, in the majority of cases, in an intuitive manner, the terms and concepts used in business environments. We believe that the goals in the educational and entrepreneurial contexts are different enough to require different quality models, contrary to what has been seen up to now.

A second error, which to a certain degree is related to that above, is that the core of many educational quality evaluations is user satisfaction, which, in this case, is student satisfaction (Gosling and D'Andrea, 2001). We do not feel that this is a good indicator, nor does it seem correct to base all the dynamics of such a complex system as education on the students' opinion (even less so if what they express is satisfaction or dissatisfaction). Opinion polls, often only carried out once and without sufficient knowledge of the educational institution (its goals, conditions, development, etc), can only lead to error in evaluating the educational community.

A third noteworthy error is the continuing and mistaken belief about the cost of distance education, one that is not helpful in any way. It is true that this kind of education can be less expensive, but if we are talking about quality education, we cannot

claim that this is the case (nor should it be) (Rumble, 1997). The costs for distance education students are not as clear as for those in attendance-based courses, and they also depend on the kind of virtual education carried out. Education focused basically on the transmission of contents, even if complex, will differ from education that attempts to provide an instrument that enhances true interaction and in which development and support staff are required.

A fourth error comes from the quantification of quality in multimedia systems that evaluates the quality of their resources in terms of the number of different paths that allow for interaction with the user (visual, audio, written, etc); whether the quality of the design or the production of the material allows for a true support for the student is less important. Even if it is a factor for potential educational use, it cannot be separated from its objectives (Sparkes, 1992).

As has been stated above, our interest in evaluating the quality of educational contexts is not focused merely on the organisational or methodological aspects, as is the case in the majority of proposals, but on the teaching and learning processes themselves. Because of this, the basic evaluation material will be the relations that are established between instructor and students, and the dialogue that comes from this practical community (Harasim *et al*, 1995). Obviously, the actions that the students and instructor carry out with the material and resources available, as well as the procedures of which students and teachers decide to take advantage from the context in order to familiarise themselves with the content of the course, will also form a part of the focus of evaluation (Barbera, 2000).

Virtual education community

Focusing on this community of virtual practice produced in learning environments, the different relations that appear in it seem to determine the dynamic core for a quality education. In this framework Moore (1989) proposes treating the analysis of quality based on three kinds of interaction. We would add the fact that multiple relations are established among the different interactions. To summarise, they are the following:

1. Interaction between material and student (we would add between material and teacher)
2. Interaction between student and teacher
3. Interaction among students

Taking into account Moore's proposal, we reflect on the fact that quality is a complex reality and a difficult one to deal with globally. This is why we have made a progressive proposal to assess virtual quality in learning contexts that takes into account the different levels of evaluation, without losing sight of the focus for the evaluation that we have mentioned above (Barbera *et al*, 2001). From here, we have built an instrument

that originates from a constructivist theoretical framework, based on the practice of these theoretical guidelines applied to different virtual contexts (Jonassen, 2000) in order to produce a high-quality learning environment. The instrument starts with the institutional motives and resources (the scenario), as we believe that this point is vital in determining the final educational process. After that, we present the purposes of the participants in the instructional process, as we believe that the implicit agenda of instructional agents has the power to drive learning in hidden ways. Moreover, we analyse teacher and student roles, the interaction between them, and the content and learning material through a psychological tool, that is, the virtual language. Finally, we propose an analysis of micro-resources and the knowledge gained as a result of the whole training process.

These applications have provided data that have progressively modified the initial proposal. The instrument has been developed by the IN3's (Internet Indisciplinary Institute) EDUS group at the Open University of Catalonia (see www.uoc.edu/in3). The instrument, which has been presented in this paper in a summarised fashion, covers different formal educational contexts, universities, professional environments, schools and so forth. Although we understand that each of these has specific objectives, with its application we have tried to characterise the virtual environment and its quality.

An instrument to enhance quality

Hence, we need articulated dimensions to evaluate the quality of virtual environments. Our proposal has a main axis based on levels of approximation to the educational process, which are the following:

1. Analysis and evaluation of the *global educational situation* and *scenario* where the educational process takes place
2. *Purposes* of said institution and the participants in the process
3. More specific analysis of the *agents as participants* and their roles
4. *Interaction* seen in the virtual context
5. *Instruments* by means of which the interaction is produced
6. *Knowledge building* developed in the learning environment that can be considered the final result of the complex educational process.

The dimensions, subdimensions and some of the indicators used by the evaluation instrument for the virtual environment are detailed in Table 1:

Table 1: *Quality dimensions*

<i>Dimension</i>	<i>Subdimensions</i>	<i>Indicators</i>	<i>Observations</i>
1. The educational action <i>scenario</i>	1.1. Psycho-pedagogical bases	— Behaviourist — Constructivist — Informational	
	1.2. General structure of the system	— Interaction system — Information access	
	1.3. Global educational conceptualisation	— Industrial model — Autonomous model — Conversational model	
2. The <i>purposes</i> of the participants in the instruction process	2.1. Teachers' and students' motivation	— Accreditation — Professional development — Continuous learning	
	2.2. Educational goals	— Conceptual — Procedural — Social	
	2.3. Cognitive demands	— Reproduction — Application — Elaboration — Creation — Quantity of demand	
3. The instructional <i>agents</i>	3.1. Teacher's and students' roles	— Dependency — Autonomy — Deep learning — Superficial learning	
	3.2. Quality of the role of the institution	— Institution-centred — Student-centred — Teacher-centred	
	3.3. Material authors	— Level of intervention — Level of interaction — Review calendar	
4. The educational <i>interaction</i> and intervention	4.1. Educational activity organisation	— Student/teacher interaction — Student/student interaction — Whole class organisation — Schedule	
	4.2. Patterns of interaction	— Joint activity structure — Specific goals — Main patterns	
	4.3. Virtual discourse	— Type of dialogue — Semantic links — Paralinguistic signs	
5. The educational <i>instruments</i>	5.1. Use and role of the written and web material	— Adaptation — Flexibility — Functionality	
	5.2. Use of different resources: collaborative methods, personal mail, videoconferences, virtual library, Internet, etc	— Accessibility — Integration — Viability	
6. The <i>knowledge building</i>	6.1. Characteristics of knowledge	— Scientific/quotidian — Implicit/explicit — Rigid/flexible	
	6.2. Construction dynamics	— Deep/superficial — Formal/common sense	
	6.3. Type of knowledge-building	— Partial/global — Practical/theoretical	

Each of the subdimensions has its own corresponding quality indicators that provide both quantitative and qualitative results. These dimensions can be used to support and recognise teachers' and institutions' efforts in developing expertise in online instruction as a part of their work in high-quality virtual learning environments. The agent carrying out the analysis must identify the quality indicator, make as many observations as possible, and write a brief report about the results for internal evaluation. The criteria for validation are those set for teaching based on constructivist parameters (Jonassen *et al.*, 1999) that are always included in some of the quality criteria for the instrument presented. Once these results are applied, they evaluate the virtual learning and teaching environment and, likewise, inform us of the need to make adjustments or adopt improvement strategies. Initially, the application of the instrument, which observes directly the virtual educational processes, provides results for an *educational profile*, given the different indicated dimensions that involve both the institution and its participants. Then, having obtained such a profile of an institution, a *contextualised study* of the resulting profile and an *improvement proposal* for those aspects that may require enhancing can be carried out.

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