

Constructs for quality in on-line learning

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ABSTRACT: To develop a culture of quality and self-improvement in on-line learning, researchers argue that responsibility should be situated close to those people directly involved. The research project described here is concerned with developing a method of assessing quality that is close to faculty and students. The method is applicable to a broad range of tertiary level on-line courses, and is quick and easy to administer. In this article, the identification of the constructs that make up the model is presented. This was done by a literature research of a very large number of publications to determine the important features of on-line learning. Subsequently, the Nominal Group Technique was utilised with a group of experts during the analysis of the information in order to determine the constructs that make up the model. After a number of rounds of discussion using the technique seven constructs emerged that are considered essential in a quality on-line course.

INTRODUCTION

According to a report in 2013 entitled *Changing Course: Ten Years of Tracking On-line Education in the United States*, on-line learning grew significantly over the ten year period [1]. The study which surveyed 2,820 universities and colleges shows that 62.4 percent of the institutions offered fully on-line degree programmes in 2012, compared with just 32.5 percent in 2002. Further the proportion of chief academic leaders that said that on-line learning was critical to their long-term strategy was at a new high of 69.1 percent in 2012. While the above growth figures are for the US, there has been similar growth in on-line learning in other parts of the world. As the number of students in higher education around the world is predicted to increase to approximately 400 million by 2030 from approximately 100 million in 2000, the growth in on-line learning can only continue [2]. This considerable and continuous growth of on-line education underscores the need to ensure that on-line education is provided in accordance with the best practices. It further underscores the need to continually research quality in on-line education and to apply the latest knowledge in the design and delivery of courses. Additionally, the quality of on-line education is frequently questioned. Critics have raised questions about effectiveness and quality issues in on-line courses, and some have suggested that the increasing number of such courses is driven by a desire or need to spend less on education. Thus, it is of paramount importance for institutions to have processes of quality assurance that are in accordance with the latest research.

For quality assurance, there are a large number of models in use by institutions around the world. Many of these are quite comprehensive and address quality from a number of perspectives catering to the needs of a range of stakeholders. However, what appears to be lacking among these models is a method that is quick, efficient and reliable and can be used by faculty and others to check on the effectiveness of an on-line course. The purpose of the research project presented here is to develop a model and, subsequently, a measuring instrument, to measure the effectiveness of an on-line course. The aim is to develop a method of assessing on-line courses, which was concise, and quick and easy to administer. The intent was that this method could be used as a yardstick to measure the level of effectiveness and to point to areas of weakness. It was not intended to provide a comprehensive evaluation of the quality of a course. Further, the intent was that the method should be sufficiently generic, so as to be applicable across a broad range of tertiary level courses. Additionally, it would serve as an exemplary model that educators could rely upon to design effective on-line courses and it would promote a culture of self-improvement.

For a course to have a high level of effectiveness, it should provide a high level learning experience to students. In order for this to occur, there are a number of attributes that should be present. In this study, the author determined these essential attributes in on-line learning and expressed them in the form of constructs. (The term construct is commonly used in instrument development). This research project has two major stages. The first, which is presented here, is the identification of the constructs. The second stage, which is currently underway, is the development and testing of an instrument to measure the constructs based on student perceptions. In this article, the author first describes how the

essential constructs in an effective on-line course were identified. He, then, sets out and discusses each of the constructs. There are seven constructs and these are: information, interface, support, engagement, collaboration, reflection and autonomy.

LITERATURE REVIEW

A study on quality in on-line education around the globe was recently conducted by a team coordinated by the European Association for Distance Teaching Universities on behalf of the International Council for Open and Distance Education [2]. The report resulting from the study provides an overview of many quality models from around the world. The researchers found that there was a large variety of quality models catering to different audiences and different needs. They found that the models provided a quite comprehensive analysis of quality for the parties concerned, but that they had deficiencies, such as: lack of universal applicability, unclear which maturity levels they were best for, not easily adaptable to change and widely divergent review quality by reviewers. They made a strong recommendation for more research to build knowledge and for more sharing of knowledge and coordination between stakeholders. They also stressed the importance of student participation in determining quality standards.

In a report by Butcher and Wilson-Strydom on quality in on-line learning, the question of what constitutes quality is addressed [3]. The authors say that there is a vast amount of literature on quality with a profusion of terms and concepts and that there is a tension between the two roles of quality assurance - accountability and quality improvement. They highlight a debate about the role of the student in defining quality saying that many argue that defining quality should begin with the assumption that on-line learning is a process of co-production between the on-line learning environment and the student, with the student perspective taken as the starting point of quality development across the various areas of on-line learning provision. They go on to identify common aspects of a quality on-line learning environment as: institutional support (vision, planning and infrastructure); course development; teaching and learning (instruction); course structure; student support; faculty support; technology; evaluation; student assessment; examination security.

An overview of a few of the models for quality assurance in on-line learning that are rather widely used in certain regions is presented below. These models are quite comprehensive covering quality from a number of perspectives addressing the needs of a variety of stakeholders. The Australasian Council on Open, Distance and e-Learning suggest a set of eight benchmarks to be used for quality assurance [4]. These are: institution-wide policy and governance for technology enhanced learning; planning for institution-wide quality improvement of technology enhanced learning; information technology systems, services and support for technology enhanced learning; the application of technology enhanced learning services; staff professional development for the effective use of technology enhanced learning; staff support for the use of technology enhanced learning; student training for the effective use of technology enhanced learning; student support for the use of technology enhanced learning. The Quality Matters Program [5], based in the USA, is a nationally recognised peer review process for quality assurance of on-line courses in different education sectors. The Quality Matters Rubric is a set of eight standards, with 41 specific indicators that is used to evaluate the quality of the design of on-line courses [5]. The rubric emphasises the alignment of learning objectives, assessment and measurement, instructional materials, learner interaction and engagement, course technology, learner support and accessibility in order to ensure students achieve the specified learning outcomes.

The Asian Association of Open Universities has created a Quality Assurance Framework [6]. The framework may be described as statements of best practice in the areas of policy and planning, internal management, learners and learners' profiles, infrastructure, media and learning resources, learner assessment and evaluation, research and community services, human resources, learner support, programme design and curriculum development, and course design and development. The Swedish National Agency for Higher Education developed a model which comprises 10 quality dimensions [7]. These are: material/content, structure/virtual environment, communication, cooperation and interactivity, student assessment, flexibility and adaptability, support (for students and staff), staff qualifications and experience, vision and institutional leadership, and resource allocation.

Shelton and Isernhagen examined 13 different frameworks for quality in on-line learning [8]. These various frameworks comprised the attributes that researchers argued are important or critical elements of effective on-line environments. They found that there was a lack of consistency between these frameworks and they suggested that there was a need for a common method for assessing quality. Ossiannilsson studied a considerable number of models for quality assurance from various countries [9]. She makes a number of points based on her study. She says that there should be a holistic approach to quality, and that quality improvement should be considered a dynamic process as the area of on-line learning is changing quickly. She maintains that it is important to create a culture of quality at all levels within an institution and not to rely on standards set from above. She also emphasises that it is very important to include students in the quality enhancement mission. Jung and Latchem conducted a study of quality approaches in a number of on-line and distance education institutions internationally [10]. Among their conclusions they make the following points. They say that the leading measures of quality should focus on outcomes and that there should be a systematic approach to quality assurance, so that quality assurance is more of a process of continuous improvement. Further, they say that an institution should be more concerned with developing an internal culture of quality and less concerned with external controls. Jung et al in a review of quality assurance approaches in Asia state that an important lesson learned was that institutions must pay more attention to the creation of a culture of quality [11]. They believe that quality

assurance can only be done effectively and be sustainable when the people involved take ownership of the processes. They say that top-down processes do not work and that responsibilities for quality need to be situated as close as possible to the people involved. Bates [12] in a review of two reports on quality by Butcher and Wilson-Strydom [3] and Butcher and Hoosen [13] highlights the point that one should not assume that creating quality assurance structures automatically improves quality. He reaffirms that though institutional quality assurance structures and processes are important, they should not be an exercise in compliance for accountability, rather they should be a process of learning and self-improvement.

From the review of literature presented above, it can be seen that there are numerous different approaches to quality designed to suit particular audiences and needs. Many are very broad covering a range of aspects to suit a number of different stakeholders. Some of the literature highlighted similar points. Many writers stated that while quality control for accountability is important, there is a need for institutions to place more emphasis on continuous improvement. They also argued that it is critically important for institutions to develop a culture of quality. Some said that the people involved need to take ownership and that responsibilities for quality should be placed close to the people involved. Faculty and students must be involved and the perspective and input of students must be carefully considered. To create a culture of quality and, thus, improve quality the focus should be on a process of learning and self-improvement. The research project presented in this article addresses some of the issues raised above. It aims to develop a method for assessing quality that is close to faculty and students, that is applicable to a broad range of tertiary level on-line courses, that is quick and easy to administer, that gives immediate feedback and that will, therefore, help develop a culture of quality. It is not intended to be a comprehensive audit of quality, but rather a quick means of measuring the essential attributes of quality in a course. This tool will be an important asset within an institution's suite of tools for quality assessment.

RESEARCH METHOD

The research was conducted by carrying out a comprehensive study of literature in the field and, subsequently, employing a panel of experts to identify the constructs. The first phase of the project involved an extensive search through published research for work that addressed the question of what constitutes quality or effectiveness in on-line environments. The author found that there was an abundance of research on the topic and that it addressed the question of quality in on-line courses from a variety of perspectives. Researchers had published guidelines, frameworks, rubrics, checklists, evaluation methods and theories aimed at teachers, designers and administrators of on-line courses. A few hundred pieces of literature were read, and from these, the author selected just over two hundred from which to extract conclusions on the attributes of an effective on-line course. In selecting these pieces of literature, the focus was on selecting papers that presented important attributes of on-line courses based on empirical research. From this selection of literature, the attributes of on-line courses were gathered. Only those attributes or factors, that contributed directly, as opposed to indirectly, to effectiveness were collected. For example, factors such as professional development and funding are considered indirect contributors to effectiveness in the context of this study.

The initial list of attributes contained many hundreds of items. These were examined and items that described similar ideas were combined. A weighting was also given based on the frequency of appearance of items. The aim here was to reduce the list to items that expressed different ideas and to note the popularity of items. This was a difficult task as the ideas were interwoven in a variety of different ways and there were different perspectives on similar ideas. For each item a description was recorded. At the end of this phase the list amounted to 121 items. In the next phase of the research, the objective was to distil the main constructs from the 121 items. This phase of the research was carried out by using the Nominal Group Technique [14]. The technique may be described as a qualitative method for obtaining consensus among a group of experts. It involves a series of face-to-face meetings of a small group of experts over a relatively short period of time with the goal of reaching consensus on a problem. The rationale behind the method is that the opinion and judgement of a group of experts has more validity than the opinion and judgement of a single expert. Use of the Nominal Group Technique in an educational setting is described by Lunenburg and Ornstein [15].

Using this technique, a group of experts examined the 121 items with the aim of reaching a consensus on what were the main constructs within those items. The group of experts consisted of six members including the researcher. All members had experience in on-line courses - all had participated in professional development, all had taught and all had conducted research in on-line teaching and learning. Over four rounds within a period of approximately one month, the group of experts discussed the list of items and eventually converged on the themes. The primary role of the researcher was to act as facilitator. As the panel members were just provided brief explanations the facilitator frequently needed to explain the items in more detail. At the first meeting, all the ideas were presented to group with brief explanations. The group was advised that the goal was to identify the primary themes within the items. The themes would be the main constructs that are considered essential in an effective on-line course. At the conclusion of the first meeting, the members took home the list and they were asked to ponder upon the problem. At the second meeting, members discussed the items and divided the items between them and each attempted to identify themes. Members stuck their items (which were printed on post-it notes) to a whiteboard under various themes of their choice. Members, then, looked at each other's grouping of items. After the meeting, a scribe noted everything from the whiteboard and distributed it to members. At the third meeting, members discussed the themes and items and worked on reducing and refining the themes. Again, after the meeting, a scribe copied the work and sent it to the members. At the fourth and last meeting, the members further reduced and refined the themes and reached consensus on the final constructs. These were

- information, interface, support, engagement, collaboration, reflection and autonomy. Each of these constructs is discussed in the following sections.

RESULTS - THE CONSTRUCTS

Information

Information is concerned with aspects related to structure, design and adequacy of learning materials. Information is a critical dimension as the majority of student time in all forms of education is consumed by students' interacting with course content or information [16][17]. In an on-line course, students interact with information or content through multiple resources, e.g. texts, instructor material, Web resources, podcasts, multimedia presentations, simulations, FAQs, orientation material and links to campus resources. On-line learning must be the dynamic integration of content and context created and facilitated, providing better ways to process, make sense of, and recreate information for specific purposes. Information must be accurate, relevant, objective, complete, verifiable, understandable, academically respectable, balanced and free of bias, updated consistently, appropriate for learning objectives and culturally sensitive [18]. Information should be presented in different modes to accommodate individual differences in processing, to meet varying cognitive and learning styles and to facilitate transfer to long-term memory [17].

Interface

Interface is concerned with the design, layout and operation of the interface, its reliability and performance. The fundamental vehicle of the learning process is communication and interaction. Those vital processes of communication and interaction technology are mediated by the technology and its interface. The interface design, its reliability, responsiveness and personalisation are key ingredients for success [19]. When appropriately designed, the interface is easily mastered by learners and allows for content presentation in a variety of formats including graphics, video and sound, as well as access to most of the course components [16]. An effective interface allows learners to log into any machine anywhere, access course content seamlessly and reliably, and is friendly and inviting and intuitive to use with discussions clearly labelled and threaded [20]. The interface promotes learning. An effective interface is a constant yet transparent presence that facilitates user comfort and connectedness when working with resources and making the necessary connections between content elements [21].

Support

Support is concerned with the support provided to students including the components of instructor responsiveness, timely feedback, emotional support, administrative and technical support. Learner support has often been declared as one of the most essential ingredients in the success of an on-line programme, as well as the backup safety net for the individual distance learning student who encounters difficulties [8][22][23]. Support generally falls into two broad areas: a) academic support; and b) non-academic or counselling support [24]. Academic support consists of defining the course territory, stating the purpose of materials and activities presented, explaining concepts, exploring the course, providing feedback, developing learning skills, monitoring progress, and enriching the course by extending the course boundaries and sharing the excitement of learning [24]. Non-academic support consists of advising, offering assessment on non-academic aptitudes and skills, providing practical help to promote study, writing references or requests for funding, promoting changes within the institution to benefit students and organising student support.

Engagement

Engagement is concerned with aspects that make the course stimulating, interesting and captivating. Engagement is an enjoyable state of concentration rooted in the affective domain of learning and results from involvement in both the academic and social domains [25][26]. When engaged, learners connect meaningfully and deeply with information, ideas, faculty members, other learners, community members and experts. On-line learning environments that promote engagement are task-centred and based on the constructivist approach [27]. Learners enjoy learning and feel a sense of satisfaction and achievement in activities that challenge and motivate them. High engagement tends to happen when students are personally interested in a topic, are drawn into discussions by other students, and are able to select authentic problems and issues to study, solve and address [28]. Engagement contextualises and organises student learning, and results in increased learner responsibility [27].

Collaboration

Collaboration is concerned with aspects of the course that promote and foster collaboration. Interaction among people has long been identified as an essential component of any learning environment [29]. According to learning theories, learning is more than the mere acquisition of factual knowledge and skills, but also socialisation into a community of practice [17]. As such, knowledge is shared and distributed among community members, especially, as work tasks become increasingly complex and the community attempts to solve problems and address issues. On-line learners, therefore, need experience in interaction and collaboration to develop the communication strategies, team-orientation skills and conflict management strategies for working cooperatively in a community of practice [30][31]. The benefits

of collaboration and interaction that underlie learning theory relate to encountering multiple perspectives, resolving differences, testing new ideas and collecting new insights [32], and the ability to create something superior through elaboration, rehearsal, negotiation and resolution of those differences with others.

Reflection

Reflection is concerned with reflective learning, the process through which students shape their knowledge and beliefs by questioning, analysing, and reframing their existing beliefs and knowledge. Reflection involves mindfulness and conscience awareness of one's thinking and subsequent learning process [33]. Reflection deepens the meaning of learning experiences and is, for that reason, a core educational aim [16][34]. Critical reflection is one dimension of self-direction and is indicated by revising/correcting, finding misconceptions, contacting new perspectives, connecting with previous knowledge and experience, and constructing knowledge. In on-line learning designed under the constructivist learning theories, students discriminate, analyse and create rather than just accumulate knowledge. Virtual learning provides the time and opportunity for reflection as students are not required to quickly respond at a particular time, place and pace, before the classroom topic shifts as frequently happens in the traditional classroom.

Autonomy

Autonomy is concerned with students taking responsibility for their own learning, exhibiting active participation in discussion and interest in exploring various aspects beyond course requirements. Since learning is an active, constructive, reflective process, learners have to set their own learning goals, determine their own effective learning strategies, and self-assess their progress and results [35]. On-line learning, more than traditional classroom learning, demands autonomous learners who can prepare, perform, regulate and evaluate their own learning, while maintaining their own motivation and concentration [36][37]. Learner autonomy has received much attention in distance education theory and many researchers point to lack of learner autonomy as the main reason students drop out of distance education courses. In an on-line learning environment content must be presented as a means to an end rather than an end in itself, and the learner must make many of the choices about which material to use, how to use it and evaluate their judgments.

CONCLUSIONS

In the present research study, an exemplary model of on-line learning environments has been proposed following an extensive research of literature. This model consists of seven constructs that will form the scales of an instrument to assess quality in on-line courses. A descriptive summary of these constructs follows.

The quality on-line learning environment offers relevant, current information in the context of the course and the profession that provide learners with opportunities to acquire relevant content skills and knowledge, general enough to be transferable and specific enough to lead to higher learning. The course promotes autonomy and provides opportunity for learners to construct knowledge through engagement in authentic tasks, collaboration and reflection. These essential learning processes are supported through and by the technology and its interface. The interface, content, communication, as well as course design offer scaffolding and learner support.

In the final stage of this research study, which is currently underway, an instrument is being developed to measure the presence and level of these constructs in an on-line course. It is hoped that the final instrument will be a valuable tool for quality assessment and will help in the development of a culture of self-improvement.

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