Collaborative Cloud-based Online Courses: Issues and Challenges

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ABSTRACT

The number of online courses has been growing rapidly worldwide. Many universities offer online degree courses, short courses and courses for continuing professional development. Online courses can be more economical and also provide flexibility for accessing learning materials through virtual learning environments. However, there are a number of issues which may affect student experience such as style of course delivery, students' learning culture, teaching resources, ownership, etc. Collaboration between universities to design and deliver online courses can have many benefits including cost reduction, enriched educational culture, environment and resources. Students will have opportunities to become involved with wider forums to discuss academic topics and also develop team working skills in this environment. A cloud-based collaborative environment will further enhance team working skills and provide easier and flexible access to resources by students. This paper presents the result of a survey which was conducted to investigate issues and challenges for collaborative cloud-based online course provision.

CCS Concepts

• **Social and professional topics~Computing education** • **Social and professional topics~Computer supported cooperative work**

Keywords

Online courses; Challenges for online courses; Online courses issues; Collaborative environment; Collaborative cloud-based online courses;

1. INTRODUCTION

The number of online courses offered by universities is increasing in response to student demand [1]. Correspondingly the number of students who enrol on online courses is increasing yearly due to the number of benefits that offered [2]. Online courses provide students with easy access to online materials anytime [3]. They offer benefits to students by reducing the cost of education [3]. They offer flexibility in how people learn and access new information [4]. Online courses can provide collaborative learning between students thereby enabling information sharing [5] [6]. In addition, universities can reduce the teaching cost in terms of physical resources.

On the other hand, online courses face a number of issues that will be raised in this paper which may affect online course design, delivery, quality, and reduce the number of students. For instance, issues related to students, academics, course designers, and finance coordinators. Students in online courses may not feel comfortable with communicating with peers and joining group works [5]. Language can be an issue [6]. Students may wish to ask questions, engage with peers and understand the content of lectures, but feel shy or unable to communicate fluently [6].

Roles of the academics involved in online courses are different from traditional face-to-face teaching [7]. They will be providing guidance to lead students through the learning process. However, they require the necessary training [7].

One possible approach to address the issues would be to have a collaborative environment between universities. A collaborative environment provides many benefits for universities, academics and students. The collaborative environment provides opportunity for universities to develop courses and teaching resources jointly [8]. The collaborative environment can also offer students the opportunity to share knowledge with their peers in virtual forums which can lead to improving critical thinking [9]. However, there may be many challenges during the development of a collaborative environment and beyond which require consideration. This will be explored in the following sections.

Cloud computing with its properties and the benefits that it entails such as accessibility, scalability and flexibility makes it a suitable technology to support this collaborative environment [10] [11].

This paper investigates issues associated with learning and teaching through online courses for students, academics and universities perspective using literature and a survey. The paper is organized as follows: Section 2 discusses the relevant research. Section 3 presents the result and discussions of the survey. Section 4 presents the conclusion of the paper and future work.

2. RELATED WORK

The review of literature revealed a number of key issues associated with online courses which are discussed below.

2.1 Online Courses Issues

The key issues associated with online courses can be summarized into: learning and teaching culture, students experience and expectation, academics experience in online course delivery, teaching resources, and financial aspects.

Learning and teaching culture: Students' learning style might be affected by their cultural backgrounds [6]. Some students may be used to face-to-face learning environments, but this does not apply to all students [5]. Students may also find it difficult to move to an online style of learning because they are familiar with their own learning methods [6]. Some academics may prefer to use the teaching style that they have been using and they may be reluctant to change it [6].

Issues related to students: Students need to have learning skills such as self-directed, self-motivated and time management skills to join in online courses and this can be challenging for students [12]. Students may encounter problems with the languages used in the online course [6]. Students sometimes would be reluctant to collaborate with peers if universities do not provide the necessary support [13]. As a result, students may not realise that the collaborative activities are part of learning, as they do not feel comfortable moving from a traditional classroom environment to an online learning environment which may include collaborative activities for learning [5]. Students require more global cases in online courses content; for example, online courses delivered from the United States typically focus on the United States cases and situations and may not provide a global prospective [14]. Students may not have the opportunity to understand the content by applying it to the situations in their own country [14].

Issues related to academics: The method of delivery for online courses is different from traditional face-to face courses and the role of academics change from transferor of knowledge to that of a subject expert who guides students through the learning process. Some academics find the variety of teaching methods that can be used for online courses challenging and may feel uncomfortable with them. Relevant staff may overcome this with training, but it will increase the running cost [7].

Teaching resources: Producing new teaching materials and moving from traditional face-to-face delivery to online courses can be challenging [12]. Resources produced for face-to-face teaching may not be suitable for online courses. Also, delivering online courses provides an opportunity to use a rich set of multimedia materials including videos and simulations [12]. Furthermore, academics should be aware of suitable tools and the technology to help students with their learning [12].

Financial Aspect: The development costs for online courses and keeping the teaching resources up-to-date are significantly higher than face-to-face courses [15]. However, the cost of delivering online courses is normally lower than courses which are delivered on campus which can influence the tuition fees [16]. For example, the average of tuition fee for online courses offered by a number of UK universities such as Southampton, Essex is lower than on campus courses [17] [18].

2.2 Collaborative Environment

A collaborative environment for online courses provides a number of benefits to institutions, students and academics. Collaborative teaching allows academics to share knowledge and responsibility for the development of curriculum content, the delivery of teaching materials and the assessment of student work [19]. It enables the sharing of teaching resources, the experience, new ideas and also the development of new courses [20]. Once collaboration has established it can involve more universities thereby providing richer education [8].

Collaborative learning in online courses provides the opportunity to students to share knowledge during discussions at forums, enabling them to develop deeper understanding of the curriculum covered [5]. It can help students to develop critical thinking by using discussion boards and forums and through group assignments and coursework help students to improve their teamwork skills [21]. Collaborative learning can also help students to enhance their self-esteem [9].
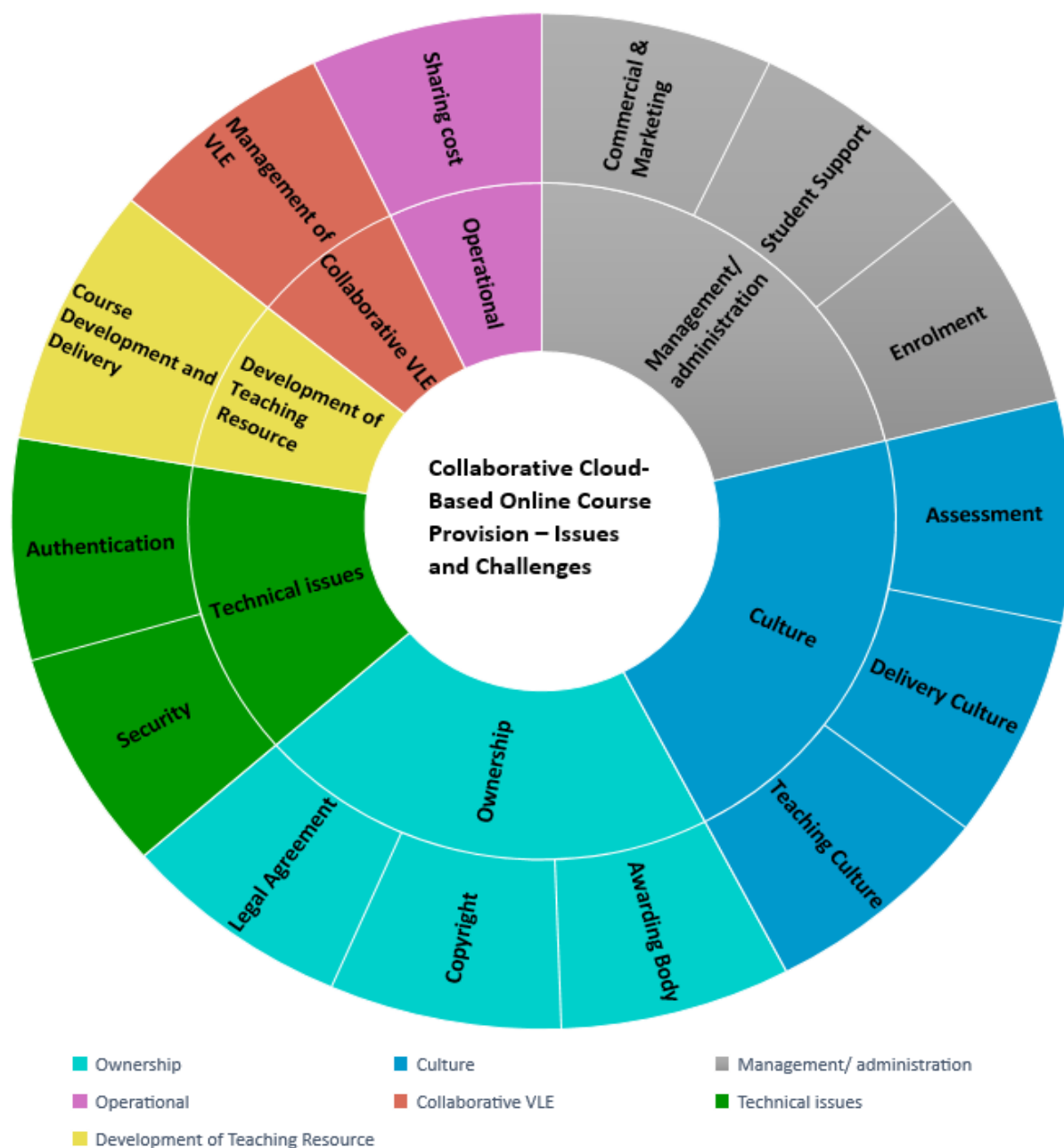
2.3 Cloud Computing Support for Education

Cloud computing services are increasingly used for applications in education [22]. A number of educational institutes are adopting cloud computing for economic reasons [10]. Some universities are also migrating their IT resources to the cloud due to its flexibility, accessibility, scalability, and ease of access [10] [11]. Other universities are creating virtual laboratories by moving their traditional computer laboratories to the cloud to reduce the complexity of managing resources, to allow more students to access them in order to increase utilization and reduce cost [23].

In addition, many cloud tools are available to the educational institutions such as Google Docs, Dropbox, etc. free of charge [11]. Many cloud providers offer services to the educational institutions to support variability of the demand [11].

3. CHALLENGES FOR COLLABORATIVE CLOUD-BASED ONLINE COURSES

To investigate and identify the challenges for a cloud-based collaborative environment for online course provision a survey was conducted. In total 16 academics with experience in distance learning courses from different universities in the UK were interviewed face-to-face, via Skype and by phone. Each interview took around 30 minutes and was recorded in audio files. During the interviews the views of participants in respect of the benefits and possible challenges of a cloud-based collaborative environment between universities for online courses provision were explored.

The recorded interviews were analysed using the thematic technique proposed by Braun and Clarke [24]. Seven themes emerged from the analysis of the interviews. They are culture, management and administration, operation, collaborative Virtual Learning Environment (VLE), development of teaching resources, technical issues, and ownership which are shown in figure 1. Each theme was divided into several sub-themes for deeper analysis. Figure 1 shows the seven themes in the inner and the sub-themes in outer rings respectively.

Note: The size of the fields in the diagram do not indicate the relative level of importants. Each theme is identified in different colour.

Figure 1. Themes, Challenges and Issues for collaborative cloud-based online course provision

Amongst the themes, ownership emerged as one of the key challenges that can influence the success of collaborative environments between universities. For example, one of the interviewees expressed:

"…as long as you are clear who owns the content, who's the students are, [you know,] which university do they belong to, or is it both, where do they matriculate, where did they graduate from?"

The participants also pointed out the importance of the legal agreement, awarding body, and copyright, which are all relate to ownership.

In respect to the operational theme, cost sharing was raised as a benefit. The majority of the participants indicated that universities are very keen to share costs. Therefore, having an appropriate agreement is crucial to split the proportion of cost between the universities involved. For example, one of the interviewees stated:

"…I think that is all down to the nature of agreement that the institutions make…"

Student enrolment and student support were raised as part of management and administration. The majority of the participants agreed that one university should be responsible for the enrolment process. For example, one of the interviewees recommended:

"...so, there has to be some control, so a student would enrol in host university ..."

However, there were some differences of opinion amongst the participants as some expressed that universities involved in collaboration should share responsibility for enrolment.

In respect to student support, those who enrol on online courses may have different support requirements, compared to students who are studying on campus.

In respect of marketing, a number of participants indicated that collaborative courses offered between universities can be more attractive to students due to wider access to resources and possibly larger student populations.

Three aspects of culture emerged from the interviews: teaching culture, delivery and assessment culture. In terms of the teaching culture, some academics may find adapting collaborative approaches challenging as they have to change their face-to-face teaching style to suit collaborative working. In addition, collaborative delivery of online courses might be challenging, especially if the academics are delivering it for the first time. Some of the participants expressed assessment design and marking for collaborative teaching would be an issue due to the preference and style of assessment and marking.

Collaborative teaching offers tutors opportunities to share experiences with different academics from different cultural backgrounds [19]. It can also save academics' time in preparing and marking. It can also help academics to improve the design of their assessments.

The majority of the participants expressed that sharing design and development of courses and teaching resources will be an issue. Some academics may not have any experience in designing online courses. In addition, online courses require teaching resources which can be very different to the traditional face-to-face mode of delivery.

" …It is not easy, … whether you're looking at HE or secondary schools or trainers standing up in the training room where people are generally given a brief: this is your audience, this the subject you're going to teach, this is the level you need to be teaching at, go away put together plan or presentation or whatever, and that's almost always done individually…"

Although some researchers have found that collaborative online courses increase the workload of the academics, there are many benefits in sharing the course development activities and delivery of online courses [20].

Management of VLE in a collaborative environment was raised as an issue. The participants questioned which university would be in charge of managing the VLE and its maintenance? Also, which university's VLE will be used for the collaborative environment? Will an independent VLE be used? One of the interviewees questioned:

"…How is VLE going to be used? Are you going to use X University's VLE or Y University's VLE?"

Security and authentication were two issues which were relate to the technical theme. Some of the participants indicated that adopting collaborative online courses through the cloud might include a security risk because we do not know where the data would be stored in the cloud server.

In terms of authentication, two of the participants commented on how one can make sure that the students who are assessed are the same students who are registered on the course.

The benefits and challenges for offering online courses, particularly within a collaborative environment require further investigations and analysis. The intention of this research is to propose a framework for a cloud-based collaborative environment for online course provision and the details will be published in due course.

4. CONCLUSION

Online courses offered by higher education institutions are becoming increasingly popular. However, there are a number of issues which affect students learning through online courses such as culture, experience of academic staff and students, learning resources, and the financial aspects. One approach to address these issues is developing a collaborative environment for the universities. A collaborative environment for online course provision can facilitate sharing expertise and learning and teaching resources. It can provide an environment for students to exchange ideas and discuss academic related issues in forums, work collaboratively in groups on coursework, share knowledge and culture and also have easy and flexible access to resources.

The paper has introduced the initial results from the analysis of a survey. Some of the issues and challenges require further investigations from the perspectives of universities and students. Subsequently, a framework for a collaborative cloud-based environment for online course provision will be proposed and published.

5. ACKNOWLEDGMENTS

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