Barriers to the adoption of computer-mediated collaborative learning practices in open and distance education

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ABSTRACT

Computer conferencing is emerging as a powerful tool for supporting collaborative learning in higher education. This form of communication is opening up new possibilities for making learning interactions more democratic, cognitively stimulating and challenging for adult learners. Unfortunately, there are concerns that complicate the adoption of collaborative learning practices, particularly in an African context. This article identifies three categories of issues which can influence successful implementation, but which are also potential sources of barriers to effective adoption. These include macrocontextual issues, institutional issues and pedagogical issues. A possible way forward is suggested.

INTRODUCTION

According to Rumble (1989), distance education is a modality which is non-contagious in nature, characterised by the separation of the teacher and student. This physical separation requires that the communication between the teacher and student be technologically mediated, using print, video, audio, and most recently computer- mediated technology. The openness in education refers to the character of the education process. Openness encompasses the degree of restrictions within the time-place dependence variation, and the flexibility of the educational philosophies underpinning issues such as access, structure, dialogue and student support systems (Rumble 1989).

Traditional forms of open and distance learning courses largely depend on preprepared or preprogrammed learning resources (Kaye 2002). The common scenario is one in which a student is supplied with learning materials and then allowed to complete the learning activities at their own pace. Often, this process is restricted with flagstones such as assignment submission dates and course/module completion and examination dates. Learning interactions will vary from "one-way" (teacher-student) interactions to more dialogic "two-way" (teacher-student; student-teacher) interactions. These interactions can be "one-to-one" or "one-to-many" forms of communication. Although distance education has generally accommodated various levels of peer collaborative learning activities, Kaye (2002) contends that opportunities for "student-student" interactions in most open and distance learning courses are limited or nonexistent.

"Computer conferencing is emerging as a powerful tool for supporting collaborative and peer learning" (Kaye 2002:70). This form of communication is opening up new possibilities of learning interactions in which learning processes can become, not only democratic (Rumble 1989), but also cognitively stimulating and challenging, particularly for adult learners. Computer conferencing is a teaching and learning domain which is asynchronous (time-place independent), and capable of supporting "many-to-many" forms of interactions (Haraism 1998). This learning format supports a social constructivist approach to learning in which there is an attempt to "integrate individual cognitive and social environments, attaching critical importance to the social negotiation of meaning supported by collaborative construction of knowledge" (Kaye 2002:9). Unfortunately, there are concerns that complicate the adoption of computer-mediated collaborative learning practices, particularly in an African context.

In this article, the benefits of adopting collaborative learning practices are presented together with three categories of issues which can influence successful implementation. These include macro-contextual issues, institutional issues and pedagogical issues. The same framework of

issues is then used to briefly explore barriers to the implementation of these collaborative practices within an African context. Finally, a possible way forward is suggested.

ADOPTING COMPUTER-MEDIATED COLLABORATIVE LEARNING PRACTICES

Potential benefits

According to McConnell (1994:15), "... cooperative learning involves working together on some task or issue in a way that promotes individual learning through processes of collaboration in groups". Some of the outcomes of cooperative learning he cites include: high mastery and retention levels, improved quality of reasoning strategies, and positive effects on social, motivational and attitudinal outcomes in addition to academic outcomes. Computer conferencing or computer mediated communication (CMC) is a form of cooperative learning without the physical restrictions of time and place. It is part of the newer flexible distance learning generations which are built around communication aspects and learner needs (see table 1).

Table 1: Distance learning models and their associated delivery technologies

Distance learning model	Technologies used
First generation(correspondence)	Print
Second generation (multi-media)	Print, broadcast media, cassettes, computers
Third generation (telelearning)	Audio teleconferencing, video conferencing, audio graphic communication, broadcast radio/television
Fourth generation(flexible learning model)	Interactive multimedia, internet-based computer-mediated communication (CMC)
Fifth generation (flexible and customised model)	A combination of appropriate technologies.

Nipper (1998) describes the first and second order generations of distance learning as those dominated by the processes of production and distribution of learning materials with limited communication between learners.

The three major benefits of these computer-supported collaborative practices are:

> • Firstly, CMC responds to the increased pressure on universities to provide new forms of pedagogy that go beyond the "talk and chalk" methods. CMC has been identified as having the ability to facilitate more learner-centred, personalised education (Palloff & Pratt 1999). What sets CMC apart are the collaborations and interactions which lead to "... the formation of a learning community through which knowledge is imparted and meaning is co-created" (Palloff & Pratt 1999:5). There is a pedagogic shift from behaviourist views of education which focus on the transmission of knowledge and in which the co-creation of knowledge is limited.

> • Secondly, CMC leads to improved learning because it can result in improved communication between the student and teacher (Nalley 1999).CMC functions as an effective instructional communication tool not bound by place and time. Collaborative forms of learning are beneficial to improved cognitive outcomes and the quality of discourse and interaction (Haraism 1998; Palloff & Pratt 1999). The CMC environment can support the skills required for the modern knowledge workers; these include critical thinking, creativity and the ability to work in teams.

• Thirdly, "CMC has the potential to tip the balance toward those students who, in the past, have been otherwise disadvantaged or disconnected" (Nalley 1998:12).

The possibilities for using technology to develop new kinds of interactions through alternative arrangements of space, time and resources for students and teachers are increasing. As a result, there is now a substantial accumulation of knowledge and experience about what constitutes successful design and implementation of electronically-mediated learning platforms (Hawkins 1991). In a study primarily designed to map out the effect of technologically-mediated forms of learning on the quality and social fabric of schooling, Hawkins (1991) identifies five groups of issues that affect the success of projects. These are "... technology functioning, community creation, discourse forms, activity definition and quality control" (Hawkins 1991:159). In this essay, the three groups of issues selected, (macrocontextual issues, institutional issues and pedagogical issues) seem to be the ones that can sufficiently accommodate issues concerning barriers to successful adoption of collaborative learning practices.

Successful implementation of collaborative learning practices

Three main categories of issues that adequately encompass the concerns which complicate the adoption of collaborative learning practices are:

- macrocontextual issues (social, political and economic)

- institutional issues (structural and organisational)

- pedagogical issues (traditional and modern)

These categories are briefly described in the next sections.

a) Macrocontextual issues

The macrocontextual issues are strongly linked to the recent digital technology revolution and globalisation, which are shaping a work force able to respond to current modern "information-driven-society" needs. The twenty-first century worker is expected to acquire skills that are transferable to the world of work. These include the ability to effectively access up-to-date, "just-in-time" content knowledge, skills in using technology, and skills in collaborating with others in geographically distributed locations (Palloff & Pratt 1999). Using computer-mediated learning strategies helps students acquire these skills. Access to resources which enable these collaborative practices to occur and be sustained is crucial for successful implementation. So far, electronically mediated distance education appears to be the only viable cost effective means for providing increased access to these forms of higher education.

b) Institutional issues

The educational philosophies and practices employed by current educational institutions (universities and training institutions) should be flexible enough to accommodate the changes in learning approaches and environments. "Current educational models, structures and approaches are inadequate" (Pallof & Pratt 1999:166). Arguments put forward in terms of post-Fordist teaching and learning cultures indicate that there is a need for a total reformulation of institutional practices and organisational structures (Bates 1994). Institutional implications for supporting remote students with networked communication services relate to both staff and students. From a staff perspective this involves identification of the type of redesigning of courses needed to support CMC activities and the costs of implementation. . From a student perspective this involves determining access and communication costs (Collis 1999).

c) Pedagogic issues

The new market demands are increasingly shaping the ways in which we develop and deliver distance learning. Digitisation of knowledge resources is transforming the storage, retrieval

and distribution of learning resources, forcing educators to search for new pedagogic approaches based on student demands, but shaped by market forces. Constructivist approaches are increasingly becoming requirements for postmodern education provision. Using these approaches, learners become co-creators of knowledge rather than consumers (Collis 1999). CMC has been identified as having the ability to support this co-creation, which in turn facilitates the acquisition of higher order skills and a deeper approach to learning.

With all the attractive and desirable attributes, collaborative learning practices are still not implemented to the extent that they should be implemented. According to Hara and Kling (2000), one of the problems is that literature on CMC and Internet based learning tends to emphasise the benefits while minimising the difficulties involved. The next sections briefly deal with these difficulties.

Obstacles to the adoption of collaborative learning practices

As previously indicated, the three categories, (macrocontextual issues, institutional issues and pedagogical issues) are used to explore the barriers to successful adoption of collaborative learning practices. In this section, these barriers are presented in terms of how well the higher education practices are congruent with those required to support CMC.

Macrocontextual issues

Tertiary education in Africa faces serious challenges. The number of school leavers and adults requiring low-cost postsecondary education increases every year and there aren't enough institutions to absorb them. Participation rates in higher education are dismal when compared to other countries. In South Africa, which is considered to be one of the most advanced countries on the continent, "... participation rates in higher education continues to hover around 1 600 per 100 000 head of population ... as compared to Egypt around 1700, Japan at around 3 100, the United Kingdom at around 3 200, Canada at around 6 300" (Dhanarajan 2002:4).

Within South Africa, the social and political issues of equity and access tend to camouflage any other issue. Even though there is awareness about the benefits of collaborative learning, the adoption of the first and second generation models of distance education, where mass distributions and economies of scale are easily realised, becomes the first priority. The situation is far worse in most other African economies.

The lack of access to technological resources is a major barrier. However, the most significant obstacle is a lack of innovative solutions for developing and implementing low-cost, high-quality, technology-mediated collaborative practices unique to the African situation. Institutions tend to adopt solutions from highly resourced communities. Adopting such solutions requires the use of technological resources to which the majority of adult learners do not have access. As long as this is the case, economic limitations will continue to be a deterring force to implementation in less resourced institutions, unless we can develop unique, cost-effective and contextualised solutions.

Institutional issues

Adopting CMC practices necessitates transformation of the current institutional and organisational structures. In order to maintain the asynchronous network services (e-mail and computer conferencing), the institution would have to make sure that the necessary access and infrastructure requirements are in place. The basic requirements would for instance

include student accounts, allowing them to access internet sources and to send e-mail to tutors. Staff would require training in handling CMC and support in related CMC functions, such as building and redesigning course materials and maintaining websites and conferences areas. Institution managers and decision makers would have to work out the cost implications for setting up support provisions required to maintain CMC activities. In less resourced institutions, there is an added challenge of how to handle those students without access to computers.

As an example, transforming a Fordist (industrial) distance education institution like the University of South Africa (Unisa) into one capable of supporting successful collaborative learning practices would necessitate re-engineering its organisational structure. In order to accommodate electronically-mediated collaborative practices, work roles for both academic and support staff would have to change. This could have implications for retraining or redeployment of existing staff, or even employing new staff. At a time when universities are looking for methods of rationalisation and cost effective means of operation, it is easy to view CMC adoption as an expensive expansion activity.

According to Collis (1999), most institutional organisational structures are still designed to support traditional modes of teaching. In a number of institutions, transforming practices has meant "doing the same things differently rather than doing different things" (Collis 1999). Attaining a level of "technical readiness" is easier than reaching a state of "curricular and administrative readiness" (Collis 1999:566).

Pedagogical re-engineering

Generally, CMC is considered to be a good model for active learning, "... limited only by time and access, not by distance or social class" (Palloff & Pratt 1999:15). For the majority of institutions, "... the assumption is still that students learn through following well-designed courses, with their achievement certified by faculty of the university based on pre-set criteria" (Collis 1999:564). Incorporating CMC activities into traditional (print-based correspondence) distance education courses involves the addition of opportunities for communication and discussions previously not included in the courses. Although there are improvements in tutor-student and student-student communication via conferencing systems, there are also frustrations associated with adopting new practices. Traditional institutions find it difficult to break away from familiar, stable and accepted modes of operation into modes which demand "pedagogic re-engineering", such as redesigning course materials, adapting to new roles, and management frustrations.

a) Redesigning of course materials

Adding components such as group work and discussion to courses changes not only the instructional composition of the course, but also its characteristics. Improving communication usually leads to an increase in personal communication between learners. As a result, there are alterations in the composition, characteristics of the course and approach to teaching and learning. For instance, in a distance education course which would normally have had a study guide and a set of assignments, the addition of a CMC component would alter the type, structure and content of the learning activities and assessment strategies within the course. Possible percentage distributions of student activities within a traditional distance education course and another using CMC are shown in table 2.

Table 2: Possible percentage distributions of student activities within a traditional distance education course and another using CMC

Type of course/ Instructional components	Print based Traditional DE	Print based and CMC or web based and CMC
Contact with tutor	5%	10%
Discussion with other students		30%
Self-study	50%	20%
Complete assignment individually	35%	20%
Complete assignment in group		10%
Take an examination	10%	10%

For the teacher, this would suggest redesigning the entire course structure and content, a process which requires new skills and time.

b) Adapting to new roles

For students and teachers, working in a virtual world with people you cannot see, hear and touch is a relatively new experience. When introducing CMC, there is a pedagogic shift from "total teacher control of learning activities to incorporation of self-directed opportunities" (French 1999:3). Roles for both teachers and learners change as new ways of processing information appear. Because the majority of students have only been exposed to behaviourist ways of learning, it takes time for most students to get used to learn in environments which involve self-directed and collaborative activities. The teacher requires moderating skills in order to nurture and support positive group dynamics. Both teachers and students become continual learners in rapidly changing learning environments. This is a position most teachers would not easily accept.

c) Management frustrations

Several factors contribute to the complexity of managing online collaborative learning experience. Perhaps the greatest challenge is the modification of the communication dynamics brought about by the introduction of CMC. Absence of nonverbal cues can distort the communication process. For instance, individual group members can fail to fit in with the "group culture" in cases where participating learners are from diverse cultures. It is easy for learners whose views are not those of the group to get excluded and lost. At times, some learners fail to participate. CMC, with its hypertext qualities, has a strong teaching dimension because it encourages critical thinking and a deep approach to learning, a trait sometimes absent in oral communication. But there are limitations, such as lack of fluency in the language used. Indigenous languages do not have a platform on the Internet. Another issue is that of grading collaborative activities. To date, a fair system of grading participation in group assignments does not exist. The argument being presented here is that the complexity of some of the management and implementation issues involved can dissuade prospective users from adopting collaborative learning practices.

The way forward

The importance of building mechanisms for decision making on how to approach learning activities is essential. Adult learning collaboration requires self-awareness as well as respect for individuals within the group. Tutor sensitivity and course design approaches in which there is a focus on the development of group culture are crucial. Adoption of modern distance learning practices requires a pedagogic shift, which in turn requires new strategies for facilitating and managing collaborative learning. Some of the necessary ingredients required to make online collaborative learning successful are: easy access to technology, flexible guidelines and procedures, commitment and buy-in from participants, democratic

environments, continual learning, and evaluation of the process (Palloff & Pratt 1999). Arguably, innovation and adaptation, where there are various combinations of old and new models of distance learning seem to be the likely scenarios for the future. In the end, the contributions of the facilitators and participants towards the creation of a learning community will determine the success of the online learning experience.

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