Learning conversations: A case study into e-learning communities

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Abstract. This paper reports some preliminary findings on the effect of social interaction on learning as evinced by the analysis of an on-line community implemented in a distance education MSc course. Following the socio-constructivist approach, the community was designed to support students in purposeful, intentional and collaborative learning. The case study indicates that communication in a positive environment has the potential for fostering learning and improving academic achievement. Implications for e-learning design and evaluation are discussed.

1 Introduction

The Internet is fast emerging as a major tool for educators but despite the exponential growth in the availability of online programs for a broad audience of students, there is little knowledge to judge the quality of such offerings. Most e-learning programs offer tools to support synchronous or asynchronous communication but the link between social interaction and meaningful learning still needs clarification. According to the socio-cultural approach to constructivism, knowledge is constructed in communities of practice through social interaction (for an on-line review see [1]). Research on collaborative learning has suggested that group-work forces students to clarify and verbalize their problems, thus facilitating solutions via discussion, ideas sharing, debating, and collaborative knowledge building [2], [3].

This paper presents some preliminary results from the evaluation of an on-line MSc course delivered by the University of Manchester in the last two years. The objective of the paper is to shed some light on the role of social interaction in relation to academic performance. The overarching goal of our research is to collect ethnographic evidence on students’ behaviour in distance education in order to establish instructional design principles that can shape effective practice in online teaching and learning. The paper is organised as follows. The next section provides an overview of advantages and pitfalls of computer-supported cooperative learning; the third section describes the case study and the final section concludes.
Learning communities

Computer supported cooperative learning (CSCL) enables a shift from traditional, contiguous, real time learning groups towards asynchronous distributed learning groups. The anywhere-anytime characteristic of CSCL has convinced many educators that these systems are promising next generation educational systems. Indeed, there are several studies reporting positive performance when students were allowed to interact with each other via chat, e-mail, forums, videoconference or other computer-mediated communication devices. In parallel, however, there exists a substantial body of research which is challenging this assumption, demonstrating that CSCL is not as successful as expected. Two major pitfalls have been identified [4]. The first pitfall relates to the false assumption that social interaction can be taken for granted and will occur just because the system supports it. The second pitfall relates to the tendency to forget the social/psychological dimensions of interactions which are particularly important in non-task related conversations.

The difficulty in establishing successful communities is broadly acknowledged [5], [6]. Social interaction on-line is not automatic but it requires a positive environment which has specific requirements as compared to the real world where people physically meet. The major social problems affecting on-line communities are:

- social loafing, (the tendency of individuals to reduce their work effort in a group) leading to low participation rate
- disinhibited behaviour, such as flaming and abuse; and
- diffusion of responsibility (the belief that the presence of others makes one less responsible for the events that occur in a situation);

Designing for usability and sociability [5], [6] may help communities to reach critical mass and create a positive environment. A common solution to the many problems hampering the establishment of a supportive community is the presence of a moderator, who can reduce the occurrence of anti-social behaviours triggered by the fundamental dimension of anonymity where the interaction takes place. In e-learning, tutors play a fundamental role in directing on-line discussions, proposing topics, facilitating discussion and fostering individual responsibility. Intelligent systems capable of automatically directing this process and substituting human intervention are being investigated, but at present, successful social interaction in a virtual learning environment is still the teacher’s responsibility.

Where a constructivist approach to online course design is taken, community development is a prerequisite in order to promote dialogue and enhance knowledge construction via learner-learner and instructor-learner interaction [7]. For the student, this sense of community is greatest where there is a sense of connectedness with the course, engendered by both social and learning dimensions and it is this that attracts and retains learners. [8], [9]. Trust and peer support developed in this way also increase the effectiveness of the virtual teams necessary for collaborative working. In these respects the development of the learning community was vital to the success of the course described in the following case study.
3 Case Study

The MSc Maintenance Engineering and Asset Management is a fully online modular masters course run at the University of Manchester since 2003. It has an annual intake of between 10-20 students all of whom are engineers in full time employment with a modal age class of between 35 and 39 years. The course was designed and developed based on an analysis of the key characteristics of a parallel and highly successful, face-to-face taught course. Particular attention was paid to the elements of community interaction in the taught course in order to integrate similar elements into the online community. Academic staff were also engaged at an early stage in course planning.

The overarching design of this community was predicated on two basic models: that of the ‘community of practice’ [10] to engender educational, organisational, individual and social benefits and, more loosely, on the five stage model of e-learning development proposed by Salmon [11]. The first stage enables students to access the online material and motivates them to use it, this is followed by online socialisation, information exchange, knowledge construction and, finally, development. Each stage is characterised by specific requirements for community moderation.

Course delivery was via the Virtual Learning Environment (VLE), WebCT, but in order to welcome the students on to the course and induct them into its mode of operation, an open website was used. This removed initial problems of user authentication and gave a gradual introduction to the more complicated VLE structure. Both social and academic tasks were designed to give a staged community development and progressively more complex community interactions and to address increasingly higher level educational objectives [12]. The community was moderated by administrative and academic staff and great emphasises was placed on maintaining up-to-date information and involving the students in frequent interactions.

Our research interest is in the design and evaluation of e-learning systems, trying to incorporate theories, knowledge and methods from Education Sciences, Human Computer Interaction (HCI) and Computer Supported Cooperative Work (CSCW) to drive this process and achieve an understanding of how to foster learning in on-line settings. In this paper we present some preliminary analysis aimed at investigating the relationships between social interaction and academic success. The analysis is based on the behaviour and performance of 20 students who registered for the course in the academic year 2003.

3.1 Results

The analysis is based on three semesters and six online modules. It addresses the following four variables:
1. Hits: number of times a student accessed the e-learning platform.
2. Read: number of times a student accessed the forum to read a message.
3. Post: number of times a student posted a message on the forum.
4. Mark: mark awarded to the student in a particular module.
For each module a set of correlations between the above-described variables was run. Results are summarised in Table 1. Significant correlations are reported in bold, tendencies are reported in plain text and non significant correlations are labelled as n.s.

**Table 1.** Correlation table.

<table>
<thead>
<tr>
<th></th>
<th>Hits</th>
<th>Read</th>
<th>Post</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td>M1: n.s.</td>
<td>M2: n.s.</td>
<td>M3: n.s.</td>
<td>M4: n.s.</td>
</tr>
<tr>
<td>Post</td>
<td>M1: n.s.</td>
<td>M2: n.s.</td>
<td>M3: n.s.</td>
<td>M4: n.s.</td>
</tr>
<tr>
<td>Mark</td>
<td>M1: n.s.</td>
<td>M2: n.s.</td>
<td>M3: n.s.</td>
<td>M4: n.s.</td>
</tr>
</tbody>
</table>

Analysing the table it appears that the number of times a student accesses the e-learning platform is independent of their academic success as well as of their participation in the community, both in terms of message reading and posting. On the other hand, the number of postings correlates with academic success, as people who posted more messages tended to achieve higher grades. All the correlation between marks and posts are significant or approaching significance. The difference in intensity of this relationship can be explained considering the variance in subject matter, teaching style and learning requirements among the six courses. It should also be noticed that the community was extremely successful in terms of individual participation and reciprocity as evinced by the positive correlation between number of messages read and number of messages posted. The link between reading and achieving is more complex and seems to be established only under specific circumstances.
4 Conclusion

Despite attempts to foster learning by different means of social interaction there is, as yet, no clear evidence as to which of these should drive the design of successful e-learning systems. Research has provided contradictory results leading to opposite predictions about the utility of Computer Supported Cooperative Learning. This paper provides some support for the socio-constructivist theory of learning in computer supported environments. Our results are preliminary but they suggest a positive relationship between active participation in an on-line community defined as the number of postings and academic success measured in terms of final module marks. People who interacted more often in the on-line community tended to achieve higher marks at exams. Lurking does not seem to be as successful.

In any case, it should be noted that the community we have studied was very successful in terms of participation and reciprocity as a major effort was devoted to its design, building and maintenance. This experience has demonstrated that technology must be supported by psychosocial competencies based on a deep understanding of the linguistic, cognitive and social behaviour of learners. Our research aims to contribute to this understanding by applying an ethnographic approach to the evaluation of existing e-learning environment and using this knowledge to support innovation. The on-going analysis includes a detailed analysis of the communication in terms of purpose (learning, social, or organisational) and style. We intend to present some of these data during the workshop.

References

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