GROUPWORK: STRATEGIES ADOPTED BY STUDENTS

Jakki Sheridan-Ross
Innovation North Faculty of Information and Technology
Leeds Metropolitan University
Leeds, LS6 3QS
j.sheridan-ross@leedsmet.ac.uk

Gill Harrison
Innovation North Faculty of Information and Technology
Leeds Metropolitan University
Leeds, LS6 3QS
g.harrison@leedsmet.ac.uk

John Gray
Innovation North Faculty of Information and Technology
Leeds Metropolitan University
Leeds, LS6 3QS
j.gray@leedsmet.ac.uk

ABSTRACT

This paper presents an account of preliminary research into strategies, especially in the area of communication methods and technologies, adopted by students undertaking group projects within the Computing and Technology disciplines. The research forms part of a five-year study of the types of support students want and find useful in an innovative curriculum. The study is being carried out by the Centre for Excellence in Teaching and Learning - Active Learning in Computing (CETL ALiC), a collaboration between the Universities of Durham, Leeds, Leeds Metropolitan and Newcastle, whose primary focus is on active learning through group- and project-based work. Initial findings indicate that students adopt communication strategies that are easily and readily available with which they are most familiar. The choice of strategy appears to be unaffected by the presence within the group of students with identified Special Needs.

Keywords

Groupwork; special needs; modern technologies; Computing; student strategies.

1. INTRODUCTION

The Centre for Excellence in Higher Education - Active Learning in Computing [1] is formed by a collaboration of four universities, Durham (the lead institution), Newcastle, Leeds and Leeds Metropolitan ("Leeds Met"). It seeks to promote active engagement in learning, particularly through the use of group and project work. Group and project work is increasingly seen as a vital part of a computing student's experience [2], and studies of student responses and attitudes to it are undertaken [3]. As part of the ongoing work of the CETL, a small investigation was carried out at Leeds Met into the strategies currently adopted by students undertaking group projects, including in particular their intra-group communication strategies with regard to time, place and technological support. Another area of interest was the situation, in relation to group-work, of students with impairments. The overall aim of the study was to use any insights gained to improve the advice and support given to students undertaking similar group project work in the future.

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2. METHOD OF INVESTIGATION

A relatively small scale investigation was planned. Clearly, the students' own perceptions of working in groups were needed, but gaining feedback from students can be a difficult task. Some initial attempts to set up focus groups proved unproductive, as students seemed reluctant (for whatever reason) to spend additional time on campus, even in return for free coffee vouchers, music vouchers or a free lunch. It was therefore decided to have an observer (researcher) attend a number of scheduled group-work sessions initially, and to follow this up with a web-based questionnaire. The sessions were of two kinds: tutorial sessions, during which the groups were working on their project, and presentation sessions, where they presented, as a group, their finished product. During the tutorial sessions, the researcher was permitted to talk to the groups about their perceptions of group working (though not in any way that would disadvantage them in the tutorial) as well as observe the group dynamics in practice. During the presentations, the researcher heard students' present self-reflections (as integral elements), on how the group had operated.

3. BACKGROUND

Leeds Met offers an innovative curriculum in the Computing and Technology areas, and introduced the concept of block teaching to first year undergraduates in the academic year 2004/5. The students are taught in seven week blocks during

which they learn the skills required to develop a product that evidences the learning outcomes. Current second year undergraduate students follow a more traditional path by learning new skills during the first semester and applying them to a project in the second semester. Observations of both first and second year undergraduates were carried out, and interesting differences between them were noted.

4. GROUPWORK OBSERVATIONS

Over a four month period from November 2005 to February 2006, 234 undergraduate students in the first and second year of their studies were observed during groupwork project presentations and tutorial sessions. Data was collected in a matrix format regarding:

- their approach to groupwork;
- interaction between group members;
- perceptions about why some group members had dropped out or swapped from one group to another;
- the difficulties and challenges they believed they had faced and how they had resolved them;
- where they had chosen to work, and why they had chosen those locations;
- the technologies and methods of communication they had used to share ideas and pieces of work to complete the tasks;
- areas of support that the students believed could have helped them perform better or produce a better result;
- any support for special needs students and the perceived impact on groupwork.

4.1 Results: Groupwork Observations

Groupwork observations provided rich and varied information from students. There was a marked difference between the information gathered during observations of first and second year students.

Regarding the general approach to groupwork, first year students experiencing block delivery demonstrated active engagement in their learning through the creation of a complete product. They had largely managed to plan their time effectively, learn the skills they needed, work together as a group, and deliver a product resulting from their group based project work. Second year students taught in a more traditional format were less successful in meeting their objectives. The majority of observations produced evidence that they were not engaging with the work they needed to complete, and did not appreciate that the skills they were developing in the first semester related to the task they would be undertaking in the second semester. The reasons for this discrepancy would bear further investigation, as a number of factors differed between the two groups, including the nature of the project undertaken. First year students were given a broad creative brief with some freedom to develop their ideas, whereas second year students were given a narrower scenario-based task.

A key feature for group success was the ability to plan the workload and allocate roles rapidly at an early stage. Too much discussion at the preliminary stage of a project appeared to waste valuable time for a group. The average group size was 5, and larger groups tended to exhibit more problems in dividing up the work so that everyone had a meaningful task to do.

Interaction between group members varied, some groups having a dominant leader, others being more egalitarian. Both of these arrangements were observed to work, depending on the personalities in the group. A larger group was considered by the students as more likely to give rise to creative differences or communication problems.

Little was learned at this stage about reasons for dropping out or changing groups.

The difficulties described by the students were mostly to do with technical or operational problems rather than problems of working within a group.

The groups met face-to-face on campus and in one another's homes, though the reasons for their choice of locations were not always evident at this point. The first year technology students needed to spend some time working together on campus as they were required to keep their creative model, a cardboard box containing plasticine figures used for stop-frame animation, in a specified room. (One group suffered an unfortunate episode when an enthusiastic cleaner did not recognise the artistic value of their work and consigned it to the bin!)

Extensive use was made of some technologies to share ideas and pieces of work to complete the tasks, most notably text messaging on mobile phones, online web-chat through MSN Messenger, and email. A very small minority of students had no PC at home, so would have been excluded from the latter two unless on campus.

Apart from one group who asked if there were any resources available for making groups work more effectively, the students did not themselves suggest any areas of support that they believed could have helped them perform better or produce a better result.

Observation of a group containing a student with an impairment showed no obvious differences from other groups in the way the group operated.

The limitations to the information obtained by observation led to the design of a questionnaire, in the hope of filling in some of the gaps that remained. Additional areas were also included, to help give a broader background against which to view students' strategies for successful groupwork.

5. GROUPWORK QUESTIONNAIRE

Over a three week period before Easter 2006, 565 undergraduate students in their second year of study were asked to complete an online questionnaire about their groupwork, including the types of communication and technologies they regularly used to communicate with their group members for project based work. Tutors were asked to give a brief outline of the aims of CETL ALiC at the beginning of a group project tutorial session and to tell the students where to access the questionnaire online. The questionnaire was distributed via the Group Project module resource area in the Virtual Learning Environment (WebCT). No incentive was offered to students for completing the questionnaire. A total of twenty-four questions were asked and 67 students have completed it at the time of writing. The language used and questions asked were carefully worded to be open and inclusive so that students could give their own view and opinion. In addition to the types of questions one might expect in such a questionnaire about communication, technologies and groupwork, there were some potentially sensitive areas addressed, and care was taken to observe best practice [4], [5]. Some of the questions were:

- had there been any changes to the group membership, and if so, for what reason?
- had they ever felt as though they were the odd one out and if so the reasons for this – poor technology perhaps, or better technology than others in the group?
- how might working with someone with special needs (or indeed how might their own special needs) affect groupwork?
- what technology did they regularly use?
- how did they communicate with their group?
- did they use the wireless (wi-fi) technology available on-campus?
- did they choose to work on-campus or elsewhere, and why?
- what was the most common time of day for contacting group members?
- were there additional types of support and resources that they would find useful?

5.1 Results: Groupwork Questionnaire

The groupwork questionnaire was circulated to second year students only, on the basis that they had more experience of university life and communicating with their peers. All of the students responding to the questionnaire were aged 29 years or under with a majority of 65% falling in the 18 to 21 year old age bracket.

The results of the questionnaire are summarised below.

52% of students worked in a group where group membership had changed. (They had been allowed to choose who to work with, rather than being allocated to groups by their tutor, but 88% had not worked with the same group of people in their first year so were forming new working relationships.) Reasons given for changes were varied and included differences in aspirations; unreliability of members, who were asked to leave; a group having too many members in it for the work to be done; clash of personalities; poor attendance; etc.

Feeling the 'odd one out' in a group was attributed variously to being of a different gender (the only female in a group); living outside the city when the others all lived on campus and socialised together; and having a job when others in the group did not, and would not make allowances regarding meeting times. Differing technology was not mentioned as a factor.

8% of students worked in a group with someone with special needs. Respondents stated that they did not consider that the groupwork was affected in any way by this factor. Examples include the following student quotes: "*I believe we have one member who is dyslexic though it has never been an issue"; "One of our members is disabled and has a helper to take notes and generally assist – most of the time he is without his helper and this does not affect him in any way"; "Yes I am hearing impaired therefore I have a note-taker, however this does not affect our studies"* The following is perhaps more ambiguous: *"X have got dyslexia, so sometimes I'm doing 2 persone's job rather than one ![sic]"*

Students were asked several questions about their preferred methods of communication and their use of technology:

- 95% used face-to-face meetings to communicate with their group; 89% used classrooms on campus for meetings with only 1 student stating that s/he used the library for group meetings.
- 93% used text messages.
- 72% used MSN Messenger with a further 7% using an alternative web-chat programme.
- 14% of students contacted each other using a landline.

- No students used Skype or other VoIP (Voice over Internet Protocol) to take advantage of free phone calls using the internet.
- Minimal numbers of students used pod casts; mp3 music or other files; pda's (Personal Digital Assistants); wi-fi (wireless) access.

The respondents generally chose to meet on campus (though during the observations, it was clear that some groups also met in one another's homes). The highest significant factor for students deciding on the location for their work was the convenience for all group members, closely followed by a flexible working area and availability of suitable technology.

88% of students communicated with group members in the afternoon, with less contact noted in the morning, early or late evening and weekends.

Additional support requested included more timetabled sessions on campus (to ensure group attendance), more help from tutors, and easier access to cameras.

6. CONCLUSIONS AND FUTURE WORK

This is a small-scale study of a limited and qualitative nature. It is intended to provide some insight into practical ways of advising and supporting students in their groupwork projects next year, when there will be a shift towards greater use of this method of assessment within the faculty of Innovation North (the faculty of Information and Technology).

The study suggests that advice and support to students could include advising them at an early stage about successful strategies adopted by students in the past, with regard to organisation, planning, role adoption, and the practicalities of communication both face-to-face and supported by technology. Possibly additional "strategy" seminars might be included at the beginning of a groupwork project, with input from previous students, or case studies of failure or success. In parallel with such seminars, Staff Development sessions to keep the group tutors of Innovation North informed would be desirable.

A number of groupwork issues suitable for further exploration are suggested by the study, and four of them can be categorised as technology, human/social factors, location and disability.

The technology used by students could be regarded as of a personal and familiar kind – text on mobile phones, email and online chat using MSN Messenger. The study clearly highlights the preferred methods of communication that students adopt. During their studies, they are expected to evidence knowledge and understanding of technologies, communication, and information management yet their preferred methods of communicating are through traditional, readily available means. They do not seek to use the latest technologies or explore less familiar tools that are freely available. This raises questions about whether universities could or should provide similar technical support for students preferred technology, either directly or through facilities in appropriate Virtual Learning Environments (such as WebCT or Blackboard), and whether students should be encouraged to consider other means of electronic communication.

Human and social factors influencing the functioning of groups have been studied elsewhere [6] but could be looked at further within this context. The group working experience does not appear to have been influenced by whether the group composition included students with impairments or not. Generic problems in this area will always arise, but improvements in dealing with them may be possible with a fuller understanding of how and why they occur.

The choice of where to work was influenced partly by the availability of technology and of a flexible working area. These requirements for a congenial group working environment are currently being explored by the Durham University participants in CETL ALiC, who have developed the idea of, and created a flexible working space called the "Technocafé" [7]. Leeds Met is also exploring ways in which students use available space for learning. With respect to students with impairments, it is Leeds Met's policy [8] to make a positive commitment towards providing such students with a learning experience of the highest quality (and of course government legislation [9], [10] requires all universities to consider this aspect of their provision). Further investigation of the situation of students with impairments within group project work would serve to ensure that this policy is implemented. This might for example be carried out through a combination of focus groups and targeted questionnaires.

In conclusion, this small study has given some useful pointers towards improving support for next year's students, and to further areas for investigation.

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