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SOLVING PROBLEMS COLLABORATIVELY ONLINE: EXPERIENCES OF AUSTRALIAN AND CHINESE HERITAGE UNIVERSITY STUDENTS

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ABSTRACT

The research reported in this paper is part of a larger project designed to compare the online collaborative learning behaviours of Chinese Heritage Culture (CHC) university students, for whom a Chinese dialect is a first language, with Australian university students of European descent, and for whom English is a first language. The collaborative learning discussion focussed on the research involved fellow students, rather than tutorial staff, facilitating those discussions.

The first component of the research was quantitative, comprising a questionnaire on readiness for online learning, and a quantitative analysis of student postings to a student-led collaborative problem solving task conducted online. The first component of the research (reported in Smith et al, 2005) showed no differences between the two groups in their willingness to self-manage their own learning, but did show that the CHC students were significantly less comfortable than the Australian students with online learning. Student postings to the online discussions were classified into organisational postings, social postings, and intellectual. There were substantial differences between the two groups in their patterns of online postings among those classifications, as well as differences in the length of postings made.

This paper will explore these findings in more detail through qualitative data generated through interviews with a subset of students from each group. Interview data provided further insight into the lesser comfort with e-learning among CHC students. Students from both groups felt there were inefficiencies in the online discussion, but CHC students also felt rather marginalised by the process. Australian students were more likely to evaluate the experience in terms of its capacity to achieve required learning outcomes in a time efficient way, while CHC students expressed more concern about how the process had impacted upon them personally. The interview data also indicated that a tutor sensitive to cultural difference is important for comfort among the CHC students in particular, since there is need for encouragement to those students to make reflective inputs to the discussion.

1. INTRODUCTION

The research reported in this paper is the second part of a larger project. The complete project was designed to identify differences between the engagement with collaborative learning, using computer-mediated communication (CMC), of Australian and Chinese Heritage Culture (CHC) students involved in a problem-based learning (PBL) unit of study involving the development of knowledge of computer ethics. The unit of study is undertaken in the third year of study in a degree in computer science in an Australian university; and students engage through CMC with the problems posed in the subject. The computer ethics subject was chosen because students enrolled in it are highly computer literate and computer comfortable, and the unit requires reflective thought and discussion in a broad range of issues. All students participating in the research were enrolled full time and on-campus.

The online discussion component of the subject comprises a sequence of online tutorials that run throughout the semester and are mediated by an online tutor; as well as a problem solving discussion sequence that is conducted during the last five weeks of semester and facilitated by fellow students. These tutorials focus on a number of issues, with the first couple of weeks largely devoted to introductions and social interaction. In the last five weeks of the semester students are placed into
groups of six or so students to collaborate on their response to a particular problem in computer ethics that they identified in an earlier assignment. Although this final online problem solving discussion is monitored by tutorial staff, those staff do not enter the discussion and the facilitator role is played by students on a rotational basis. The task for each group of students here is to self-manage the discussion and problem solving to result in a further assignment that is submitted by the group, and assessed as a group assignment. The semester-long sequence of online tutorials continues in parallel and in a different space. It was the problem-based learning (PBL) component in the last five weeks of the unit of study that formed the focus of the research.

All CHC participants were overseas students for whom a Chinese dialect was the first language. All CHC students had met the university entrance requirement of an overall band score of at least six in the International English Language Testing System, with no band score being less than six. Australian students were of European descent and English was their first language.

The first part of the project is reported in Smith, Coldwell, Smith and Murphy (2005). That research involved twelve Australian and twelve CHC students from the computer ethics unit of study completing a readiness for online learning questionnaire (McVay, 2000); as well as a close analysis of the number and forms of postings that each group of students made to the CMC discussion space.

Earlier research with the McVay Readiness for Online Learning Questionnaire (Smith, Murphy & Mahoney, 2003; Smith, 2005) established through factor analysis two major factors underlying responses to the instrument. The first of these factors was student willingness to self-manage their own learning; and the second factor measured comfort with using e-learning as a learning and discussion tool. The factor comparisons between the CHC and the Australian students showed that the two groups of students were equally willing to self-manage their own learning, but that Australian students were significantly more comfortable with e-learning.

Additionally, six students from each of these two groups participated in a component of the research that more closely analysed student postings to the CMC discussion. The research procedure involved identifying individual message components, which were classified as social, organisational, or intellectual, using the frameworks developed by Paulsen (1995) and Mason (1991). Results indicated that both groups participated equally in socialisation online; CHC students posted a higher number of messages associated with organisational matters; Australian students posted a larger number of message components associated with intellectual contributions to the discussion. Although the total number of messages posted by both groups was the same, the mean number of words in the postings by Australian students was twice as high as that for the CHC students.

Since the CMC discussions were student facilitated with no teacher guidance, these results were interpreted to provide support for previous findings by Jensen, Christie and Baron (1997) and Baron (1998), that teacher guidance in online environments is more important for CHC students than for their Australian counterparts. Additionally, since prior to the problem solving discussion taking place, all students had been given opportunity to socialise through assessed tasks, the equal number of socialisation messages was taken as providing some support for the Smith and Smith (2002) contention that CHC students can engage equally well in online socialisation provided they are given opportunity to develop this form of comfort and skill through purposeful learning activity. The lower number of intellectual postings were interpreted as support for Tu’s (2001) suggestion that CHC students have a need to maintain 'face' and may be more reticent to risk reflective comment, or comment that may have shown any degree of misunderstanding of what was being discussed. That possibility is even more likely in an environment where the group facilitator may not have been culturally sensitive (Chen et al, 1999).

While that first part of the project (Smith et al, 2005) was largely quantitative in nature, the second part of the project, reported on in this paper, was qualitative in approach. This second part of the research was designed to provide richer data to enable a comparison of the online collaborative learning behaviours and experiences of the two groups of university students. The focuses of this component of the research were:

- Student experience during collaborative problem solving sequences;
- Student attitudes to the experience;
• Skills perceived by students as required for effective engagement with online collaborative problem solving;
• Student views on value of the online collaborative problem solving experience.

2. RESEARCH METHOD

Six CHC students, and six Australian students, all of whom had participated in the first part of the study, volunteered to be interviewed for the second part of the research. Participants volunteered to be interviewed about their experiences in the collaborative problem based learning component of the unit of study. Of the CHC students, three were Singaporeans, two were Malaysians and one was from Hong Kong.

Interviews took place after student results in the unit had been formalised, such that there was no sense of coercion on student participation or interview response content. Interviews were audio-taped and transcribed. The interviews largely took the form of loosely structured discussion, focussing around the following discussion-guiding questions:

• Tell me something of your experiences during the collaborative problem solving component of the computer ethics unit you have just completed. For example, how did you manage the work yourself, and how did you manage the inputs with others, and the engagement between you and other students;
• Tell me a bit about how well you liked participating in the problem solving discussion; and also tell me some of the things you didn’t like about it;
• Let’s talk now a little about the sorts of skills you felt you needed to work in the collaborative discussion, and perhaps whether or not you felt you and others had these skills;
• Tell me now a little about how well you think this exercise worked to enhance your learning and understanding of this unit.

3. RESULTS AND DISCUSSION

3.1 Student experience of the collaborative problem solving discussion

Australian students reported a number of different experiences with the online discussion, each of which they felt had been important to them. Students generally acknowledged that the discussion component of the unit was important since the subject matter lent itself to collaboration. Students also felt that there was sufficient interaction occurring on the discussion sites, characterised by unevenness between students, with some contributing frequently and others being relatively inactive. Students also commented on the nature of the postings made by other participants, noting a frequent need to interpret comment and then redevelop it from a fairly cryptic form into something more broadly understood. As one student put it:

"Someone would make a discussion point and then someone else would respond, and then we would have to clarify it all and rewrite it so we all understood it in the same way. That’s where so much of the time was sort of taken up, as when you have to write back and clarify."

A common concern among student interviewees was the silence, or low level of participation and input, from some of their fellow students. It was difficult for students to achieve the required outcomes of the discussion ‘because some people didn’t participate’, and it was difficult to gauge whether these people were eventually going to participate and just hadn’t to date, or whether they were never going to. As one student said, commenting on the asynchronous nature of the discussion, ‘it was hard because it wasn’t at the same time so you didn’t know if you might get it or maybe never would’.

Australian students also often commented that their Asian fellow students, for whom English was commonly not a first language, typically posted very short and cryptic messages that were ambiguous and needed clarification, or where the meaning was misconstrued by others in the group such that time wasting departures from the focussed discussion resulted. These comments have a strong resonance with the observations by Chen et al (1999) that extensive and open reflective input from CHC
participants in CMC is considerably enhanced where the online facilitator is culturally sensitive and engaged in a way that enables trust and supportiveness to be shown in encouragement of student postings. In the current research, where facilitators were fellow students, albeit sometimes of CHC origin themselves, that practiced cultural sensitivity was largely absent.

Generally the Australian students felt that the online collaborative discussion had been more time consuming than if they had been able to conduct the discussion face to face in real time, since it required them to spend more time interpreting the postings of their colleagues and checking that the understanding was correct. One of the six students who had some work placement responsibilities at the time of the discussion felt that, although a face to face discussion may have been quicker, the discussion online had meant she could participate regularly and still carry out her work placement.

Chinese students commented specifically on difficulties with the experience that were due to language differences, exemplified by one student who said he had to spend a great deal of time practicing the grammar of his posting to the discussion before he could make it. Chinese students also felt that their Australian counterparts were not always patient with their language difficulties. One student put this succinctly when she said:

*Australians can be very straightforward so it seems a bit rude, and sometimes they seemed sort of a bit angry with messages I had put in the discussion.*

It seems likely that the perceived impatience on the part of Australian students would have negatively impacted on the maintenance of ‘face’ among the CHC participants. This is an important finding from this research and relates strongly to Tu’s (2001) comments that the need among CHC students to maintain ‘face’ is of vital importance for their continued successful engagement with CMC.

‘Getting started’ (as one CHC student put it) in the discussion was a problem faced by a number of the CHC students. Finding a point in the emerging discussion at which they could begin their participation was something that seemed difficult, and that would have profited in the students’ view from the assistance of a facilitating staff member. There was evidence that CHC students actively sought out offline face to face discussion with other students (normally, it seemed, other CHC students) to assist them in developing their responses to the online discussion. That was not in evidence among the Australian students, and provides some support for the Smith and Smith (2002) contention that CHC students working collaboratively online need purposeful beginning exercises to enable their entry into a discussion at an early stage.

CHC students, like their Australian colleagues, were also concerned that the asynchronous nature of the discussion resulted in time inefficiencies, delays, and misunderstanding. Students from both cultural groups reported that, when they had acted as group facilitators, it had fallen largely to them as individuals to pull together some form of coherent response to that part of the discussion, whereas an experienced tutor would have been better skilled at that task. They also felt that much of the final response had been developed by themselves as group facilitators.

### 3.2 Attitudes towards the experience

All students participating in the interviews had experienced some form of online learning before this unit of study, but it was this unit that had introduced them to collaborative online discussion.

There was little difference between the two cultural groups in their attitude toward the collaborative online discussion. Students would have preferred the discussions in this unit to have been face to face in a more traditional tutorial format, with a staff member as facilitator. Some students disliked the experience intensely (eg ‘I hated it’), while others drew attention to some of the communication difficulties noted above to substantiate their preference for a face to face experience. Australian students tended to couch their views of the experience in more systemic and pedagogical terms, basing their preference for face to face in terms of the quality of their learning, and the time efficiency with which it was achieved.

CHC students were more likely to express their dislike in terms of how the experience had impacted on them as individuals. They were concerned at their own apparent marginalisation in the discussion due
to their postings not being understood, or not being used to contribute in any important way to the discussion and its final outcome. There was also concern expressed that Australian students would just commence the business of the discussion without any form of introduction or socialising precursor to the discussion, such that CHC students had difficulty in gauging their own timely interventions to the discussion. The finding that CHC students were more concerned than Australian students with the impact of CMC discussions on them personally is an interesting one. This concern most likely indicates the CHC student feelings of inadequacy in language, in the form of discussion that demanded a fuller conversational form than perhaps they were able to sustain (Bjorck, 2002; Wertsch, 2002), and the feeling that their postings may cause them to lose face rather than to enhance it (Tu, 2001); and a level of discomfort in the absence of an instructor (Jensen, Christie & Baron, 1997; Baron, 1998).

Additionally, CHC students were reticent to disagree with the direction discussion was taking, preferring instead to acquiesce but not to necessarily feel comfortable about that. They felt that facilitator-students were not able to structure and direct the discussion in an inclusive way, adding to the issues of marginalisation. Australian students who reported that they had ‘just gone along with the discussion’ but not necessarily agreed with its direction were more likely to attribute that to a desire to keep the discussion moving towards a conclusion as soon as was possible. Again these findings serve to provide further confirmation of previous research (Walker, Bridges & Chan, 1996) that has shown a strong motivation among CHC students in PBL environments to avoid conflict in the discussions.

Consistent with the large body of research that indicates that lack of response to a students’ posting reduces the motivation to further contribute, (eg Sims, 2003), it was not uncommon for students of either cultural group to feel somewhat unmotivated to contribute to the discussion, since feedback to their postings was not reliable, nor necessarily relevant. One CHC student made an interesting contrasting statement in saying:

On campus I get to see my classmates. To be honest, I have no motivation (with the online discussion), like today, I should have logged on at 2pm but I didn’t.

### 3.3 Skills perceived by students as required for effective engagement with online collaborative problem solving

An amount of the skill perceived as necessary for effective engagement online was associated with technical characteristics of the software, and the need to be familiar and comfortable with the operation of it. CHC students appeared to be more concerned with that than did the Australian students, largely associated it seemed with their lower access to local support from friends and fellow students who had more experience with the particular software. This observation from the interview component of the research serves to at least partially provide further insight into the findings from the first quantitative part of this research (Smith et al, 2005) that showed that CHC students were less comfortable with e-learning than Australian students. In that component of the research it was observed that the major contributions to the lower level of comfort with e-learning among CHC students came through less comfort with CMC engagement. In other research on predicting online learning achievement, Bernard et al (2004) have identified through factor analysis a dimension associated with confidence in the technical skills of CMC that was separate from the dimension of interaction. However, the Bernard et al (2004) research has not made comparisons of students from different cultural groups, such that currently it is uncertain how CHC students may fare on these two dimensions in comparison with Australian students.

Good facilitation skills were commented on by both groups as necessary for effective collaboration. For the Australian students these skills were seen as necessary to provide a structure for discussion, to organise it efficiently, to ensure there was useable input from all participants, and to pull the discussion together to provide a coherent conclusion for submission as the group’s work. While CHC students expressed much the same views, they were also concerned that the facilitator needed to have good socialisation online skills to ensure that students could enter the discussion comfortably, be considered as equal partners in the discussion, and to have input recognised as useful even if not so artificullty or lengthily expressed (Chen et al, 1999; Smith & Smith, 2002).
CHC students also commonly lamented that their English language skills and comfort in the language were a barrier to participation, along with their reticence to post messages they felt were not well enough expressed.

Students from both cultures observed that good collaborative online interaction requires a certain level of 'electronic diplomacy' such that postings made were not unduly hurtful or excluding of others. They also observed that this was a skill not all fellow participants had been able to exhibit.

3.4 **Student views on value of the online collaborative problem-solving experience**

CHC students commonly expressed the view that they didn't think they had had sufficient value from the unit because of the need to engage through online collaborative discussion. They felt that their engagement with the unit discussion was uneven, with little reliability about the consistent presence of other students, and little reliability about the quality of response from others. Also of concern to them was that their postings were not always understood sufficiently by others for response to them to be meaningful. That had the effect that issues they wished to discuss were not picked up on by others to foster that discussion; and that they felt that they were not valued as participants.

Australian students appeared more concerned than the CHC students with the management of the discussion through to a coherent outcome. Australian students were more apparently sensitive to the need for the discussion to reach a conclusion, and more concerned when it did not. The concern here was more about the efficiency of time to reach a conclusion, such they felt the value of the experience was not commensurate with the time they had devoted to it. Although they did express a preference for the discussion to have been face to face, that preference was more associated with the richness of the discussion and the efficiency of time they felt would have attended it. CHC students appeared less concerned about outcome, and more concerned about the value of the process which they believed had not yielded value to them because they had not been able to participate in a way that they saw as fulfilling. What appears important here though, is that both groups were aware of process and of outcome, but the CHC students felt less able to influence the discussion towards an outcome, increasing their feelings of being less personally involved.

These are interesting observations that are not entirely consistent with previous research (eg Li, 2002; Tweed & Lehman, 2002) that has indicated that the outcome of academic achievement is of utmost importance to CHC students. Our findings from the interviews would indicate that Australian students seemed to be more concerned with outcome, while the CHC students were more concerned with the process. However, it is also possible here that the CHC student concern about process was the result of a perception that the CMC process used in the unit of study being undertaken in the current research was less likely to achieve successful outcomes for them in assessment. In other words, the concern about process may have actually been driven from a concern about outcome.

Both groups of students felt that the exercise had some value as an experience of online collaborative problem-solving, and had afforded them an insight into the process. However, in terms of outcome, for different reasons they felt that the problem set had not been solved in any collaborative way. Instead, they saw it as a process where the outcome was not generally contributed to by all participants, and was finally put together by a student facilitator who did the best that could be done with the discussion that was available. Part of the process that did appear to be widely valued was the capacity for interactivity, even if they felt that had not been achieved as well as they had hoped on this occasion.

4. **CONCLUSIONS**

The results of this second qualitative part of the research provide further insight into the quantitative data from the first part of the study. In summary, this second part of the investigation indicates that culturally sensitive tutor support is an important ingredient in effective collaborative learning for CHC students and, to a lesser extent, their Australian counterparts. Perhaps the most interesting conclusion is that without tutor involvement and mediation, CHC students feel marginalised and undervalued as contributors to the discussion. Accepting that the results of the current study are influenced by differences in language capability and confidence, there is evidence that the lower degree of comfort with e-learning among CHC students, shown in the first part of the research, is likely to be associated
with the feelings of marginalisation and a reticence to make the sort of conversational and reflective inputs to discussion that provide the intellectual drivers. The importance of tutor mediation was commented on by Australian students as well, but their concern was mainly about the lack of systematic engagement in the discussion by other students, and an element of frustration expressed about the time involved in seeking clarity in the postings of CHC students.

Implications for good practice in cross-cultural online settings, most particularly those that include CHC students can be drawn from the research. First, culturally aware tutor-facilitators are important to moderate and guide discussion on an ongoing and active way, and in a manner that ensures the inclusion of all students and the valuing and utilisation of their inputs. Part of tutor involvement is likely to be the reinterpretation and recasting of postings where language is unclear. Additionally, there is value in purposeful orientation exercises online that provide for the practice and the confidence for students to interact in an inclusive, reflective and conversational way. Finally, sets of guidelines to assist and encourage students to engage in the discussion in a regular and meaningful way that ensures more consistent progress towards problem solving would be useful.

5. REFERENCES


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