SOCIAL STRATEGIES AND GROUP DEVELOPMENT IN DISCOURSE FOR E-LEARNING

S. A. Walker
School of Education
University of Leeds
Leeds
LS2 9JT
UK

ABSTRACT

This paper examines the way that young people participating in an e-learning environment create social space to build an effective community for learning. Interactions are analysed to determine the process of group development and to explore the strategies that students use in order to establish roles and relationships. The process of group development is compared to Tuckman's (1965) model of 'forming', 'storming' 'norming' and 'performing'. The analysis shows that Tuckman's model remains valid for groups which work through the medium of synchronous computer-mediated communication and that much of the discourse that appears to be off-task is important in building social relationships and thus in facilitating the successful development of the group.

KEYWORDS

Group development, group roles, synchronous CMC

1. INTRODUCTION

Computer-mediated communication (CMC) has a variety of uses in education including distance learning, e-learning, language education and developing discourse skills such as argumentation. A group of learners mediated by CMC is as much a community as a face-to-face class and so it might be assumed that the group will pass through the same stages of group development. These stages ('forming', 'storming' 'norming' and 'performing') were first described by Tuckman (1965). However, although it has been assumed that a CMC group will pass through the same stages there has been little research to test the validity of Tuckman's model in CMC contexts.

The study described in this paper looks at the development of a group of young people who participated in synchronous CMC discussions as part of a programme to develop argumentation skills. Transcripts of the discussions were examined in order to look at the development of the group and to explore any emerging participant roles. The first part of the paper explains the background to the study whilst section three presents findings and the final section presents conclusions together with direction for further research.

2. BACKGROUND

The stages by which a small group, such as a class or workgroup, develops were first described by Tuckman (Tuckman, 1965). According to Tuckman's original model, there are four main stages in the development of a group[1]:

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[1] A final stage, called 'adjourning' appears in later literature (Tuckman and Jensen, 1977) but this is only relevant when a group comes to an end. In this case the group continued beyond the life of the study and so there was no closure stage.

- Forming; in which the group meets. The facilitator needs to establish the purpose of the group and formulate ground rules.
- Storming; personal conflicts become apparent and there may be challenges to the authority of the facilitator or leader. The conflicts of this stage are necessary in order to develop an atmosphere of trust from which the next stage can evolve.
- Norming; the group becomes established with rules and standards accepted by members. The group can now work purposefully towards achieving its aims as members now understand what is expected of them and have developed a familiarity and ease with each other.
- Performing; having become established the group moves towards fulfilling its aims and goals.

This model may appear to be 'pop psychology' however, even thirty years after development it still holds validity as the base model for understanding group dynamics (Rickards and Moger, 2000, Wheelan et al., 2003). Rickards and Moger (Rickards and Moger, 2000), for example, claim to offer an alternative to Tuckman's model yet this, as they admit, is actually a reworking of Tuckman's "time-hallowed stage-model" (p281).

Although this model has been extensively studied in face-to-face settings, there appears to be little research into the validity of the model in computer-mediated groups, although occasionally there is the assumption that the model stands (for example (Burge, 1995, McAlister, 2001). Burge, indeed, refers to "the inevitable stages of group development (p156) without presenting any evidence that the stages are inevitable in computer-mediated group. Furthermore, although the importance of social and community aspects of computer-mediated groups has been widely recognised (for example, Wegerif, 1998, Rovai, 2001, Soller, 2001, Krejins et al, 2003, Soller, 2004) there appear to be few attempts to apply Tuckman's model to CMC contexts. One study that does investigate group development in a CMC setting is Johnson et al (Johnson et al., 2002) who looked at adult (post-graduate) learners on an internet-delivered course mediated by an asynchronous bulletin board. They found that the stages of group process appeared consistent with Tuckman's model.

Salmon (Salmon, 2000, Salmon, 2002) advises moderators (facilitators) of online learning groups and presents a five-stage model for facilitating CMC learning which includes as its second stage 'online socialisation', thus recognising the importance of social context. However, Salmon does not acknowledge the role that conflict can play in either learning or group development – an important stage in Tuckman's model. It should be noted, too, that Salmon's work is based on asynchronous CMC – although synchronous CMC is mentioned, Salmon assumes that the two media are essentially the same in terms of their learning impacts and the skills needed by a facilitator. Salmon's model can be contrasted with that used by Palloff and Pratt (Palloff and Pratt, 2001). Palloff and Pratt refer to a seven-stage model of group process (McClure, 1998 – again based on Tuckman and Jensen). This model appears to extend the pre and post conflict phases with conflict occurring as the midway phase of group development. This appears to confirm rather than contradict the validity of the original five stage model in which the group must move through a more disruptive conflict stage to a more constructive and exploratory performing stage.

3. METHOD

This study took place at an out of school learning centre (CHALCS) in a British inner-city area. The centre serves a multi-ethnic and multi-lingual population and aims to help young people to improve their academic performance. To achieve this aim the centre offers out of hours classes in maths, science and literacy. The study presented here formed part of a longer project within the literacy strand which aimed to improve students' argumentation skills through a programme of CMC discussion (Walker 2003). Table 1 and Table 2 show the composition of the student group in terms of gender, ethnic background and age.

Table 1. Students participating in the study by gender and ethnic group

Ethnic Background	Girls	Boys
African	2	1
Black	6	2
Asian (Indian)		3
Asian (Pakistani)	3	4
Total	**11**	**10**

Table 2. Ages of students in the study

School year (age)	Number of students
Not known	1
5 (9-10)	1
6 (10-11)	2
7 (11-12)	5
8 (12-13)	4
9 (13-14)	6
10 (14-15)	1
11 (15-16)	
12 (16-17)	1

The discussions took place within the WebCT™ Virtual Learning Environment. A topic was posted to a page within WebCT and then when the students arrived for the class they read the topic question, looked at any web links and then entered the synchronous CMC environment (chat room) to discuss the topic. After the discussion, a pair of students (either volunteers or nominated by the tutor) wrote a collaborative summary of the discussion. This was written using MS Word and then converted to HTML and posted to the student presentation tool of WebCT. Once the summary had been written and posted, the tutor read through the summary with the class and discussed/commented on both the discussion and the report. Students also had access to the WebCT bulletin board which they used to post suggestions for new topics or reflections on the discussion.

Discussions were facilitated by a tutor who introduced the topic aloud to the class and elicited some preliminary ideas. The tutor also set 'ground rules' for discussion during this 'starter' phase of each lesson. During the discussion the tutor used a range of strategies to encourage participation and argumentation (Walker, in press). All discussions were logged automatically by WebCT. The logs were then reviewed to explore the phases of group development and student behaviours. Logs of the first three sessions were then reviewed to explore the phases of group development and student behaviours.

It should be noted that the transcripts presented in this paper are reproduced verbatim except that all names have been changed to preserve the privacy of participants.

4. RESULTS AND DISCUSSION

Before the first CMC session of this study, the class had been together for only one week before starting the CMC programme. That week had been spent on preliminary activities such as student information forms and reading age tests. This meant that their first real opportunity to 'form' was in the initial CMC session. The first session was intended to be a 'warm-up' discussion to introduce the students to the chat tool. The topic was CHALCS itself, with the students asked "Why did you decide to come to CHALCS?" This was intended to be an introductory session in which the students could learn how to use the CMC tool and start learning how to debate within the CMC setting. The log of this introductory session shows several 'forming' strategies in use as demonstrated in Example 1.

Example 1. Examples of group forming strategy

Turn Nº	Speaker	Content
1/15	Gatnam Foloroy	Hello everybody my names Gatnam but call me G for short.
1/16	Hijrah Saleem	is it fun here do you enjoy yourself g
1/17	Joel Heywood	HI G
1/74	Viviane Thomas	… Sofia, what school do u go to?
1/75	Joel Heywood	Thanks Raja
1/76	Gatnam Foloroy	nice to meet you Nayan you can call me G
1/77	Sofia Ziyad	Viviane I go to CGHS short for City Girls High School

Although these turns, are, strictly speaking 'off-task', they are important in terms of the students getting to know each other and establishing their places in the group. As well as getting to know new people,

students also start to explore existing relationships within the group (with each other and with CHALCS), for instance, in Example 2 Raj makes clear his sibling relationship with Nayan.

Example 2. Identifying pre-existing relationships

Turn Nº	Speaker	Content
1/108	Raj Mistry	NAYAN,SPELL MY NAME RIGHT IN FUTURE,BECAUSE AFTER ALL I AM YOUR BROTHER

Similarly, there are several turns where students ask each other about the length of time that they have been coming to CHALCS which might be seen as establishing seniority within the class (Example 3).

Example 3. Establishing seniority at CHALCS

Turn Nº	Speaker	Content
1/45	Viviane Thomas	Sofia have just started commin' to CHALCS?
1/58	Sofia Ziyad	Viviane I started three years ago, but I came on the Tuesday class.

An analysis of this first session (Table 3) shows that most student contributions in this first session were task related with only 36 turns (21% of student turns) being completely off-task.

Table 3. Student turns in the first session

Turn type	Number
On-task	71
Interpersonal	22
Metastatement	45
Off-task	36

Meta-statements are turns that are about the discussion rather than part of the discussion (therefore still task-related). The number of meta-statements in the session was high partly because students were learning to use the chat tool and partly because the (physical) classroom and the routine were both unfamiliar. For example, the classroom used for this class had no windows or air-conditioning and contained a large number of computers. This meant that the room tended to be both airless and hot. Typical metastatements can be seen in Example 4.

Example 4. Metastatements

Turn Nº	Speaker	Content
1/5	Faisal Mahmood	What does sofia mean?
1/7	Viviane Thomas	Faisal it's someones name
1/50	Gatnam Foloroy	Mr Tutor how come it's so hot in here?
1/53	Viviane Thomas	Mr Tutor acn we go for a break, it's really hot? Please?

In the context of group process, even off-task turns can be viewed as functional (Kreijns et al 2003). These turns can perform functions such as establishing common interests or challenging (thus establishing) the boundaries of the group. These functions are not mutually exclusive.

Example 5. Off-task turns to establish areas of common interest

Turn Nº	Speaker	Content
1/71	Raj Mistry	Everybody if you enjoy action films, die hard twos on tonight at 9on three
1/75	Joel Heywood	Thanks Raja
1/90	Raj Mistry	DID EVERYBODY HAVE A NICE TIME IT THE HOLIDAYS
1/92	Hijrah Saleem	is it do you play jetslalam
1/95	Gatnam Foloroy	Hijrah if you are so obsessed with Jetslalom that I'll show you how to play!
1/97	Joel Heywood	what kind of game is jetslalam
1/100	Sofia Ziyad	No but I would like to stuff that game in your mouth
1/101	Khaliq Yusuf	How do you log on toJETSLALAM, Gatnam?
1/102	Hijrah Saleem	which
1/103	Sofia Ziyad	Your favourite jetslalam
1/104	Gatnam Foloroy	It's a game where you are in a plane and you have to dodge these triangle things that come in the way

The examples quoted above all show participants testing possible (off-task) topics of discussion. Although 'Jetslalom' proved successful in engaging other participants, neither holidays (no response) nor films (one response) generated significant interest. In terms of group dynamics, it is likely that these off-task topics were testing the teacher's willingness to enforce the designated topic as, indeed, eventually he does (Example 6).

Example 6. Teacher enforcing 'rules'

Turn N°	Speaker	Content
1/128	Joel Heywood	hijrah jetslalam is rubbish
1/129	Mr Tutor	Ladies and gentlemen or boys and girls, are we not leaving our topic of discussion? No body seems to ask others about CHALCS and their reasons for coming to CHALCS!

Note the personal insult which appears in turn 1/100 (Example 5). This type of turn is also challenging and establishing the boundaries of the group. This is part of the 'storming' phase of group development; students are challenging the each other and teacher to see how what response their comments will generate.

This challenging 'storming' behaviour can be seen more clearly in the second session of this phase. Unfortunately, for that session, the usual class tutor was absent due to illness and his place was taken by a substitute: an experienced teacher but new to the class and CHALCS. Even the first few turns of the second session show participants endeavouring to establish their roles within the group. For example, the third turn (Example 7) contains a minor personal insult.

Example 7. 'Storming' behaviour in session 2

Turn N°	Speaker	Content
2/3	Sofia Ziyad	I ment to say hi but Hijrah the nutcracker typed in h

Two participants enter the room with a television catchphrase that was popular at the time (Example 8) and are challenged by another student who, in turn, is challenged himself (Example 9). The participants are now trying to establish levels of dominance within the group. This behaviour continues for almost 80 turns before the teacher attempts to establish his presence.

Example 8. Use of popular catchphrase in session 2

Turn N°	Speaker	Content
2/5	Joel Heywood	WASAAAAp
2/6	Faisal Mahmood	it's waaaaaaazzzzzzzzuuuuuuuup!

Example 9. 'Storming' behaviour in session 2

Turn N°	Speaker	Content
2/7	Gatnam Foloroy	Now now children don't get excited
2/8	Sofia Ziyad	Since when did you become the teacher Gatnam?
2/9	Joel Heywood	Take a chill pill Faisal

More examples of 'storming' type behaviour can be seen in Example 10. Here, Alham starts to assert the role that she adopts throughout: that of a 'monitor', slightly impatient at disruptive behaviour.

Example 10. 'Storming' behaviour with emergence of 'monitor' role

Turn N°	Speaker	Content
2/48	Alham Iqbal	wot is the matter with u Sofia????
2/49	Gatnam Foloroy	i got one thanks
2/50	Hijrah Saleem	yes sofia wots the matter with you
2/51	Gatnam Foloroy	yes sofia
2/52	Alham Iqbal	all of you u are just being stupid!
2/53	Faisal Mahmood	yes Sofia
2/54	Sofia Ziyad	Alham Gatnam keeps on making fun of my sister
2/55	Gatnam Foloroy	no we're not
2/56	Sofia Ziyad	Yes you are Gatnam
2/57	Gatnam Foloroy	sofia hijrah is not you're sister
2/58	Hijrah Saleem	hello gatnam
2/59	Alham Iqbal	well its not exactly about u is it now? if it was then u could start stressin' but it's not so let your sister fight her own battles!

This 'monitor' role can be seen again in Example 11 where, in this case, Alham is responding to behaviour in the classroom rather than in the CMC environment.

Example 11. Alham adopts a 'monitor' role

Turn Nº	Speaker	Content
2/131	Alham Iqbal	Rosemarie, can u please stop shouting "did u get it Lucy?" because she gets it as soon as u press enter

The tutor first starts to establish presence in turn 2/77 (Example 12) but this is largely ignored by the students. The tutor, with little experience of facilitating CMC, is following the face to face convention of waiting until everyone is present before starting the discussion. In a CMC setting this is unlikely to be a successful strategy as there is no instant means of gaining the attention of the group.

Example 12. Tutor attempts to establish presence

Turn Nº	Speaker	Content
2/77	Tutor	ok were just waiting for "Shaun"........ and then we'll start the discussion OK?

This attempt to establish presence is followed by some overt challenges to tutor authority (Example 13).

Example 13. Challenges to the tutor's authority

Turn Nº	Speaker	Content
2/116	Tutor	We will soon Faisail then you can get all that pent up genius into the chat! That goes for you Alham
2/136	Tutor	OK, today were talking about Exclusions&..would somebody like to start please?
2/141	Tutor	i think we need to start messing about now and get on with it...
2/128	Faisal Mahmood	Learn how to spell Tutor!!!!!!!!!!!!!!
2/156	Sofia Ziyad	Tutor you wrote we should start messing about now that is what we are doing

Eventually, the class settles and, having begun to establish roles, is able to discuss the topic (although there is still a certain amount of off-task behaviour, as might be expected with a 'stand-in' teacher). This is the 'norming' phase described by Tuckman in which the rules and standards are set for group interactions. Example 14 shows this: one of the basic rules of group discussion is that interactions should be with the group rather than just between individuals and, in Example 14, Gatnam makes this explicit. Alham continues with her 'monitor' role, as the main enforcer of group standards becoming more forceful (Example 15).

Example 14. Establishing rules for group interaction

Turn Nº	Speaker	Content
2/243	Gatnam Foloroy	rosemarie, lucy communicate with the rest of the class not each other

Example 15. Forceful application of 'monitor' role

Turn Nº	Speaker	Content
2/589	Gatnam Foloroy	khaliq you are on another planet!!
2/590	Gatnam Foloroy	who cares what they do?
2/591	Alham Iqbal	SHUT UP GATNAM TALK ABOUT THE BLOODY SUBJECT!!!!!!

By the third session the usual tutor has returned from his absence and the class has entered the 'performing' stage of development. The topic for this session is capital punishment and was available on the VLE before the start of the class although a (spoken) introduction to the topic was also given by the tutor together with 'ground rules' for the session. Example 16 shows the first few turns of the third session. Turns 1-14 are all social in nature: saying hello and making 'small talk' about the day. The students then move into the topic (turn 3/15).

Example 16. Beginning of session 3

Turn Nº	Speaker	Content
3/1	Hijrah Saleem	hi sofia
3/2	Sofia Ziyad	hi Hijrah
3/3	Hijrah Saleem	how was your school day today was it good?
3/4	Sofia Ziyad	yeah it was okay how about you?
3/5	Hijrah Saleem	it was cool

3/6	Sofia Ziyad	cool
3/7	Hijrah Saleem	yea\]
3/8	Hijrah Saleem	yeah
3/9	Khaliq Amin	Hello sofia,WAAAAAZZZZZZZZZUUUUUUPPPP!!
3/10	Hijrah Saleem	Hi Sofia
3/11	Khaliq Amin	HELLO shaun
3/12	Khaliq Amin	hi sofia
3/13	Khaliq Amin	hihijrah
3/14	Khaliq Amin	hi viviane
3/15	Sofia Ziyad	Who thinks that people should be punished if they have done something wrong or no?
3/16	Anwar Saleem	K
3/17	Faisal Mahmood	HI
3/18	Faisal Mahmood	Hi, anybody there?
3/19	Faisal Mahmood	Anybody There?
3/20	Viviane Thomas	I don't think that people should be killed for murder, because they might not be guilty land then it'd just be like murderring somebody for nothing.

What is notable about this session is that the tutor had no online presence for the first 30+ minutes of discussion. The tutor finally logged on after 36 minutes of debate, during which time, 75 turns had been contributed all of which (apart from the first few social turns) were on task. At an earlier stage of the group development process, the group would probably have engaged in off-task discussion as, indeed, had occurred in the second session. However, the group had reached the 'performing' stage of development and this can be seen from the fact that, even without tutor input or control, the discussion was tightly focused and on-task. This suggests that the stages of group development described by Tuckman may be as relevant to computer-mediated groups as to groups developing through face-to-face communication.

5. CONCLUSIONS

This study considered the Tuckman model of group development (Tuckman, 1965) in relation to CMC group process. Tuckman's model consists of four phases: 'forming', 'storming', 'norming' and 'performing'. Although this model has been in existence for over 30 years, it is still has not generally been superseded for understanding the stages of traditional discussion group development. Occasionally this model is also referenced in relation to the formation of CMC groups but with the assumption that the model is of equal validity for CMC and traditional face-to-face contexts. However, given that there are considerable differences between face-to-face and computer-mediated communications then it is possible that a model developed before the advent of CMC might require revision to have explanatory power in such a context. Therefore, the study analysed the behaviour of participants, as the group developed. When the model was applied to the development of a new CMC group then the stages proposed by Tuckman can be seen, suggesting that the model may still be relevant to CMC contexts. It is also possible that students who are already in established groups in face-to-face educational contexts may revisit the earlier stages of group development of forming, norming and storming when learning to use CMC. The main implications of this for tutors are that

- At the beginning of a CMC course or programme, participants need opportunities to become acquainted with each other and to establish group roles **in** the CMC environment so that there should a healthy working group.
- Tutors should be aware that there may be a period of 'storming' – in which group and teacher boundaries may be challenged. Although this may be resolved (as in this study) by group members adopting group management roles, the 'storming' period may also need the tutor to take an active role in resolving conflict.

The development of group roles is a particularly interesting area for future research. In the 'norming' phase of group development, members of the group adopt the roles that they will hold. These rules are not necessarily allocated deliberately or consciously but are nonetheless necessary for the effective functioning of the group, for example, ensuring that the group remains on task or maintaining the social well-being of the group. Within the CMC class, students could be seen to adopt these roles; for example, one student clearly took on a behaviour monitoring/task focusing role whilst another assumed a role of asking questions to open

new aspects of the topic. Having adopted these roles and responsibilities, students themselves were able to play a large part in the facilitation of discussion sessions throughout the programme although support from the tutor was still necessary and important. However, the nature of the different media meant that the ways in which the students adopted these roles differed in the traditional and CMC case. For one thing, in the CMC discussions, the students appeared ready to adopt responsible roles normally reserved for the tutor. Further research could determine whether these types of community roles could be allocated to participants and how this might affect group performance. In particular, it will be interesting to discover whether allocating specific facilitation roles to students might relieve demands on the tutor and enable more in-depth discussion of a topic. Pilkington and Kuminek (2002) and Pilkington and Walker (Pilkington and Walker, 2003) have already begun to investigate the possibility of allocating community roles to participants but do not base this on a model of group development. Incorporating such a model might lead to different roles being allocated at different stages in the development of the group in order to facilitate effect progression to the 'performing' phase.

REFERENCES

Burge, L. (1995). Electronic Highway or Weaving Loom? Thinking about Conferencing Technologies for Learning. In *Open and Distance Learning Today*. F. Lockwood. London, Routledge.

Kreijns, K., Kirschner, P. A. and W., J. (2003). Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: a review of the research. *Computers in Human Behavior* **19**(3): 335-353.

McAlister, S. R. (2001). Argumentation and a Design for Learning. Milton Keynes, Centre for Information Technology in Education, The Open University.

McClure, B. (1998). *Putting a New Spin on Groups*. Hillsdale NJ, Erlbaum.

Palloff, R. M. and Pratt, K. (2001). *Lessons from the Cyberspace Classroom*. San Francisco, Jossey-Bass.

Pilkington, R. M. and Kuminek, P. A. (2002). Using a role- play activity with synchronous CMC to encourage critical reflection on peer debate. In *ICT for Curriculum Enhancement*. M. Monteith. Bristol, Intellect.

Pilkington, R. M. and Walker, S. A. (2003). Facilitating Debate in Networked Learning: Reflecting on Online Synchronous Discussion in Higher Education. *Instructional Science* **31**: 41-63.

Rickards, T. and Moger, S. (2000). Creative Leadership Processes in Project Team Development: An Alternative to Tuckman's Stage Model. *British Journal of Management* **11**: 273-283.

Rovai, A. P. (2001). Classroom community at a distance: A comparative analysis of two ALN-based university programs. *The Internet and Higher Education* **4**(2): 105-118.

Salmon, G. (2000). *E-moderating: The Key to Teaching and Learning Online*. London, Kogan Page.

Salmon, G. (2002). *E-tivities: The Key to Active Online Learning*. London, Kogan Page.

Tuckman, B. W. (1965). Developmental Sequences in Small Groups. *Psychological Bulletin* **63**(6): 348–399.

Soller, A., Guizzardi, R., Molani, A. and Perini, A. (2004). SCALE: Supporting Community Awareness, Learning, and Evolvement in an Organizational Learning Environment. *Proceedings of the 6th International Conference of the Learning Sciences,*, Santa Monica, CA.

Soller, A. L. (2001). Supporting Social Interaction in an Intelligent Collaborative Learning System. *International Journal of Artificial Intelligence in Education* **12**.

Tuckman, B. W. and Jensen, M. C. (1977). Stages of Small Group Development Revisited. *Group and Organizational Studies* **2**: 419-427.

Walker, S. A. (2003) *The Contribution of Computer-Mediated Communication in Developing Argument Skills and Writing-Related Self-Esteem*. Unpublished PhD thesis, Leeds, University of Leeds

Walker, S. A. (in press) Socratic Strategies and Devil's Advocacy in Synchronous CMC Debate. *Journal of Computer Assisted Learning*

Wegerif, R. (1998). The Social Dimension of Asynchronous Learning Networks. *Journal of Asynchronous Learning Networks* **2**(1): 34-49.

Wheelan, S. A., Davidson, B. and Telin, F. (2003). Group Development Across Time: Reality or Illusion? *Small Group Research* **34**(2): 223-245.