Adolescent Collaborative Discourse through Messaging

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Abstract

This paper reports on research carried out as part of a doctoral thesis which focuses on how the social software of the mobile internet, such as text messaging and picture messaging, is used by teenagers in the process of constructing negotiated and shared understandings of unfamiliar environments in which they find themselves.

To this end, the study was constructed such that students were given opportunities to collaboratively explore and navigate unfamiliar environments using the technologies of the mobile internet, as well as to engage in debate, and use multimedia evidence recorded in the field to defend their positions both to peers in the field and in the classroom, regarding various issues of concern to these environments, with specific links being made to their studies in geography.

Key research questions that delineate the bounds of the study are:

• How do pupils seek to explore and understand the local environment in which they find themselves?
• How are such understandings of three-dimensional environments communicated, through text, pictures and video, with their peers and friends?
• What are the mechanisms (including textual and non-textual cues) which teens employ to coach their peers to successfully navigate alien environments?
• How can the technologies of social software, specifically messaging technologies of the mobile internet, augment and/or detract from the semiotic processes of making and sharing meaning about place?

Specifically, the requirement that the students engage in real-time collaborative interaction while still onsite in multiple remote locations can only be properly realized with the mobile internet. No longer should students have to wait till they return to school before sharing their thoughts with their peers.

The study encouraged students to empathise with, and defend, different points-of-view. Through debate, students gained an appreciation of the issues pertaining to the geography around a particular location. The quality of the debate was a function of their powers of observation, and what they perceived as meaningful in their environment.

1 Introduction

The study explores how mobile phones can be used as tools for collaborative learning around two geographical tasks designed to give insights into how teens perceive their local environment.

The first task required pairs of students to help their peers navigate unfamiliar environments, using only text- and picture-messaging. Through an analysis of which aspects of these environments students find meaningful, teachers would be in a better position to translate geographical concepts from the textbooks into terms and metaphors to which teens can more easily relate.

In the second task, teams of students explored a bounded area, looking for pieces of evidence which they could use to support non-congruent points-of-view. They recorded these pieces of evidence pictorially, using the phones, and exchanged these pictures in real time while still in the field, physically separated from each other. This kind of task was only feasible given the affordances of the present generation of camera phones. Students used the evidence to explore given geographical issues regarding the bounded area, in the format of a Structured Academic Controversy.
By analyzing the pictorial exchange, teachers will better understand which particular aspects of their local environments teens perceive to be relevant to the given geographic themes.

Kress (in press) has noted that “the shift from the dominance of the book and the page to the new dominance of the screen is paralleled by a change in canonical modes of representation, away from the dominance of writing to an increasing use of image”. As educators, we should make the choice to learn more about (if not embrace) the technologies from which our charges derive so much interest, to investigate how we might best channel these sources of motivation towards improving the learning process. To quote Rheingold (2003): “the emphasis on social software today ought to be a reminder that the real capabilities of augmentation lie in the thinking and communication practices these tools enable.”

2 Review of Literature

2.1 Distributed Intelligence and Social Constructivism

One of the primary theoretical constructs underpinning this study is Pea’s idea of ‘distributed intelligence’ (described in Perkins (1992)). To quote Perkins,

people think and remember with the help of all sorts of physical aids, and we commonly construct new physical aids to help ourselves yet more. People think and remember socially, through interaction with other people, sharing information and perspectives and developing ideas … People sustain thinking through socially shared symbol systems – speech, writing, the technical argot of specialties, diagrams, scientific notations, and so on. (p. 133)

Perkins develops the idea further by elaborating on three ways in which intelligence can be distributed; namely physically (describing the gamut of student output from completion of traditional problem sets, to journals and portfolios, to simple programming and desktop publishing), socially (co-operative learning), and symbolically (for example, through diagrams & charts, concept maps, and role-play).

The germ of these insights was planted in Vygotsky’s cultural-historical theory of activity, first formulated in the 1920s, in which the relationships between human agents and objects in their environment are mediated by culture, tools and symbols.

These same notions of “culture, tools and symbols” are implicit in Dewey’s work in 1938, when he talked about the principle of interaction between the learner’s personal and social worlds. Dewey was one of the first to elucidate that it was through this very interaction that ideas are communicated and meaning is constructed and shared. Vygotsky, Dewey and Perkins were remarkably prescient, considering that they had developed their ideas before the widespread adoption of the worldwide web as a medium of information exchange and collaboration (let alone more contemporary technological developments such as the mobile internet).

Perkins’s contemporary at Harvard – Putnam (1993) – brings to the present discussion the term ‘social capital’. This refers to social networks which go beyond traditional familial ties and connect friends and strangers for mutual benefit. Social capital is therefore the basis of collaborative behaviour.

The basic unit of social capital is information, defined by Boeck (in press) as “material which is selected by individuals to be transformed by them into knowledge to solve a problem in the specific social domains to which they belong”. In the study, the ‘problems’ in which the students found themselves are described through what Johnson and Johnson (1979) term ‘Structured Academic Controversies’.

2.2 The Structured Academic Controversy

Defined as the “deliberate stimulation of intellectual conflict by creating a highly structured situation wherein one student’s ideas, information, conclusions, theories, and opinions are incompatible with those of another, and the two seek to reach an agreement by engaging in Aristotelian ‘deliberate discourse’” (Johnson, Johnson and Smith (1997)), such Academic Controversies permit investigations of the social distribution of intelligence, by building on traditional models of debate and encouraging participants to reach shared consensual values.
Such investigations exemplify Habermas’s (1981) concept of ‘communicative action’ – defined as ‘the use of language with an orientation to reaching understanding. Defined thus, Myerson (2001) explains that communicative action is shared action – such ‘small-group engagement’ is the ‘process by which people come to an understanding about something’.

The study sought to apply the principles behind the design of Structured Academic Controversies to learning environments in which the protagonists were not necessarily co-located.

2.3 Cognitive Mapping and Frames of Reference

Part of the orienteering task in the study required students to successfully transpose orientations of their physical selves in three-dimensional space to two-dimensional pictorial representations thereof. This so-called cognitive mapping, defined by Peuquet (1998) as “the cognitive representation of geographical-scale space, from the immediate space of one’s own neighbourhood, to very large and complex spatial entities such as towns and cities”, means that “the traveler must necessarily build a cognitive map of the environment by integrating observations over extended periods of time, inferring spatial structure from perceptions” (Kuipers and Levit, 1990).

In doing so, the traveler is navigating and constructing his own naïve geography, defined as “the body of knowledge that people have about the surrounding geographic world” (Egenhofer and Mark, 1995). It is generally agreed that cognitive maps are not founded upon the metric Euclidean geometry of traditional maps (Kuipers, 1982).

Indeed Bidwell (2004) describes at least three Frames of Reference (defined as a co-ordinate system which spatially relates objects and their components) – cognitive maps demand that the individual employ mainly Egocentric (viewer-centric origins and axes) and Allocentric (origins and axes are anchored to prominent reference objects such as buildings) Frames of Reference. Iachini and Logie (2003) go one step further and postulate that in physical, rather than laboratory, environments, Egocentric Frames of Reference are employed more than their Allocentric counterparts. In contrast, navigating using Euclidean properties (such as distance walked) is referred to as using Extrinsic Frames of Reference (for example, North). While the language of these latter maps is familiar, and includes elements such as the scale and legend, cognitive maps require a new syntax to describe (Jiang, 1998).

One such element is the axial line, which is essentially a line of sight and a proxy for intervisibility. A set of axial lines around a person represents the viewable space, sometimes termed the vista space. In turn, a set of vista spaces eventually forms the entire urban environment in which the individual finds himself. The task of determining how to traverse one’s vista space is known as wayfinding.

According to Jul (2001), wayfinding can be modeled as a “problem-solving and decision-making activity, in which participants determine a sequence of actions which will lead to a desired goal, including discovering what options are available and deciding among them”. These options of wayfinding are “sequences of locomotional steps” believed to lead from the present location to the intended destination. In cases when the intended destination is beyond the individual’s immediate vista space, then the sequences of steps are subdivided into a set of intermediate locations. The order of traversing these intermediate locations is known as the route.

Vista spaces are punctuated by landmarks, which vary from person to person. Such landmarks are not necessarily the largest or most prominent structures in the vista space, instead they are that which reside in the individual’s memory, and therefore that which the individual finds most meaningful. Tulving (1972) makes a distinction between episodic and semantic memory. The former is the kind of memory which receives and stores information about specific events. The latter is the organized knowledge a person possesses about concepts and their interrelationships. The two are not entirely discrete. Learning involves associating events with concepts in semantic memory as examples. Cognitive maps, consequently, comprise both semantic and episodic memory.

2.4 Functional Loads, Modes of Discourse and Conversational Frameworks
Portugali (1996) has asserted that individuals gain information about the external environment, not only by navigating through geographic space, but also through reading maps, through language, photographs and other media. Further, as they navigate through geographic space, they encounter elements that “act as symbols”.

Such symbols can be a “physical landmark, a word or phrase, or a building in a photograph. These trigger our internal knowledge representation”. Each symbol derives meaning from “both the specific cultural context of that individual and by the specific meaning intended by the generator of that symbol” (Peuquet, 1998) Kress (in press) terms these symbols ‘criterial features’. Echoing Peuquet, he postulates that these symbols represent the symbol-maker’s “interest, his position in the world at that moment, vis-à-vis the object to be represented”.

Notwithstanding the adage of the worth of a picture, Kress acknowledges the differing functional specialisations of text and pictures as conveyers of meaning. In the study for example, students used text messages to communicate procedural information (e.g. “turn left at the coffee shop”), and used pictures to communicate appropriate orientation (e.g. “walk straight till you see this sign”). The relative frequencies with which text is used vis-à-vis pictures, would be a proxy for the respective functional loads placed by teenagers in peer communication.

Analyses of functional loads in communication tend to be hampered by the many modes by which people communicate (speech, visual depictions, gestures, body positioning – to name a few). By requiring communication through an exchange of text- and picture-messages, the study attempts to simplify the variables somewhat. As students interact through exchanging their respective criterial features of their local environments through text- and picture-messaging, it is hypothesized that their cognitive maps of the various field sites will be reinforced.

The seminal work of Sinclair and Coulthard (1975) might be investigated as the basis of analysing the discourse modes in text-messaging. In analysing classroom discourse, they devised a hierarchical structure comprising acts (elicitations, directives and informatives), which in turn structure moves (framing, focusing, opening, answering and follow-up), which in turn realise exchanges. Examples of the latter include ‘teacher inform’, ‘teacher direct’, ‘teacher elicit’, ‘pupil elicit’, ‘pupil inform’, ‘check’ and ‘re-initiation’. Sinclair and Coulthard caution against the broad applicability of their scheme to contexts outside of traditional classroom talk.

More recently, Gee (1999) has written extensively on the role of discourse both as a characteristic of, and in building, cultural identities and social groups. Baring his Vygotskyian roots, he has declared that the twofold primary functions of human language are to scaffold the performance of social activities and to scaffold human affiliation within cultures, groups and institutions. Given such a premise, it should come as no surprise that the theory of discourse which he subsequently elaborates upon is founded upon investigations into six so-called ‘building tasks’.

These tasks are defined as what we do with language to build a network of communicative social interaction, and comprise semiotic building, world building, activity building, identity- and relationship-building, political building and connected building. Taken together, these tasks serve as a plumbline against which to evaluate the validity of any discourse analysis. Nevertheless, Gee himself acknowledges the limitations of force-fitting his tools of discourse analysis to research on new media, “anticipating that these tools will be transformed, or even abandoned, as readers invent their own versions of them”.

Laurillard (2001) has taken up this challenge and has proposed a ‘conversational framework’ in which she describes the dialogue between teacher and learner, which she sees as central to learning. Itself based on the work of Pask (1975, 1976), her framework distinguishes between theoretical representation and experiential environment, through the lenses of both teacher and learner. She sees this distinction as critical to an understanding of higher level learning, through the linkage of theory with practice. Laurillard recognises that depending on the nature of the mathemagenic activity (that is, the activity which “gives birth” to the mathemos [Gk, “that which is to be learned”]), different parts of the conversational framework would come more into play than others. In the context of the present study, the interactions between teacher and learner in the experiential environment are especially relevant.

### 2.5 Social Software and Communities of Inquiry

Various authors (e.g., Palloff and Pratt, 1999; Russell and Ginsburg, 1999) have made explicit reference to the formation and sustenance of learning communities in conjunction with online learning. In these latter studies, the
focus has been less on individual learning, and more on the social nature of cognition and the making of meaning; as Zukas and Malcolm (2000) succinctly express it, “students and teachers are considered to be social and cultural actors with identities emerging from their wider social experiences”.

Finally, synthesizing these various strands is the term ‘social software’. This has been defined as “any software which enables groups of people to communicate and to collaborate, and which exists for the benefit of the everyday non-specialist user…[it] supports and improves mainstream social practices, both offline and online” (Davies, 2003).

To this, Coates (2003) has added that social software augments collaborative activities by facilitating creative processes in groups, structuring the processes so as to have a distinct and productive end result. This same facilitation of group processing addresses Roschelle’s (2003) caution that the over-complication of technology often results in the over-simplification of the social aspects of distributed wireless learning environments.

Garrison and Anderson (2003), writing about e-learning in general (which they define as “learning facilitated online through network technologies”), identify three key elements of what Lipman (1991) has termed a ‘community of inquiry’, which, in turn, is characterised by an environment in which choice and a diversity of perspectives encourages higher-order thinking and learning; these key elements are namely cognitive presence, social presence and teaching presence.

Briefly, social presence is “the ability of participants in a community of inquiry to project their full personality, socially and emotionally, through the medium of communication being used” (Garrison, Anderson and Archer, 2000); teaching presence is “the design, facilitation and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes” (Anderson et al, 2001); and cognitive presence is defined as “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a community of inquiry” (Garrison, Anderson, and Archer, 2001). The extent to which these three elements of a community of inquiry can be fostered through learning activities using text- and picture-messaging is a focus of the present research intervention.

Of particular relevance to the present study is cognitive presence. Garrison, Anderson and Archer explain that cognitive presence is ‘operationalized’ by what they term the ‘practical inquiry model’. In practical inquiry, there are four phases: namely a triggering event, in which teaching presence is employed to explicitly introduce an issue or problem, in terms of learning tasks, to the learners; exploration, in which the learners are required to understand the nature of the problem, and then move through the social exploration of ideas to a fuller exploration and subsequent selection of relevant information; integration, in which learners begin to assess the applicability of ideas in terms of how well they describe the issue; and finally resolution, in which learners work towards building a consensus. It should be noted that these four stages of the practical inquiry model correspond very well to the respective stages in a Structured Academic Controversy.

In conclusion, Heidegger (1927) saw communication as the process by which ‘people share their sense that the world can be comprehended’. Myerson (2001) reminds us that ‘without such communication, people will lose confidence in the possibility of understanding their experience of the world…education is all about supporting the feeling of intelligibility by opening out lines of communication’.

3 Discussion

3.1 Orienteering Task

For the orienteering task, four of the ten groups of students were successful in completing it within the allocated time. That is to say, four of the ten ‘leading’ pairs were able to successfully guide their peers in the ‘following’ pairs along the prescribed route, using only a combination of text- and picture-messages. Of these four ‘leading’ pairs, female students were in three – the only pair of male students, and their corresponding pair of male ‘following’ students, actually managed to complete the activity in the shortest recorded time (56 minutes, compared to a mean among the other three successful groups of 74 minutes), partly because they were the only one of the ten ‘following’ pairs who elected to run throughout the entire activity (this pair was able to run because their corresponding ‘leading’ pair gave them a textual overview of their entire route within the first fifteen minutes of the activity).
One finding, in particular, from the results of the orienteering task is relevant at this point of the discussion, and that is the gender difference with respect to propensity to use pictures in communication as opposed to text. A comparison of the thirteen pairs of female students and the seven pairs of male students revealed that among the former, they sent, on average, one picture-message for every 3.7 text-messages; the corresponding figure for the male students was one for every 3.3 text-messages.

Another interesting result is that, among the ‘following’ pairs, those who were successful sent on average one text-message every 2.95 minutes, compared to only one every 3.56 minutes for those who could not complete the route in time.

What conversations did the students have as they attempted to guide and follow each other in the orienteering task? It was found that the ‘lead’ pairs in the successful teams used the following discourse types more frequently than their counterparts in the unsuccessful teams:

- Instructions (issued once every 6.9 minutes on average, compared to once every 9 minutes for ‘lead’ pairs in the unsuccessful teams; \( t=1.006, p=0.344 \)).
- Directed tips (for example, “The signboard is hidden among the trees” and “It’s between the veritas and another building” – these were used once every 6.8 minutes by successful ‘lead’ pairs, compared to once every 14.2 minutes by unsuccessful ‘lead’ pairs; \( t=2.312, p=0.050 \)).

Together, the above means that every three minutes or so, successful ‘lead’ pairs would have either issued an instruction or a directed tip.

Successful ‘lead’ pairs also used the following discourse types, which their counterparts in the unsuccessful teams did not at all:

- Questions seeking elaboration (for example “What ting yes?” and “Found.. Pls specify again..”).
- Questions addressing misconceptions (for example, “U gt cr0s the rd ar? U cant cr0s it” and “U didn’t walk towards the p0ol rite?Er u c0uldnt walk there.”).
- Questions seeking to verify attainment, specifically by utilising learner’s own terms / modalities (for example, “Y g0t hs0s?” and “What is the mms u send?”).
- Conditional presentations of alternative (for example, “If you do not, find the track.” and “Or jus try ur best to find xiao guiling first”).
- Statements of assurance (for example, “i tel u where to go after that”).

A hierarchical cluster analysis was performed on the various discourse types used by the ‘lead’ pairs, and this resulted in three major categories of discourse, namely ‘expressions for instruction’ (questions checking for understanding, questions seeking to determine or verify attainment, instructions and re-instructions, and exploratory questions), ‘focussing expressions’ (questions seeking elaboration, conditional presentations of alternative, and directed tips) and ‘secondary utterances’. In terms of Laurillard’s (2001) conversational framework, ‘expressions for instruction’ can be thought of as being used as the “teacher sets [the] task goal”, while ‘focussing expressions’ are used as the teacher “gives feedback” on the learner’s action.

A discriminant analysis performed on the three discourse categories demonstrated that there was a significant difference between the number of so-called ‘focussing expressions’ between successful and unsuccessful ‘lead’ pairs. In terms of Laurillard’s conversational framework, successful ‘lead’ pairs gave more “feedback on action” to the ‘follow’ pairs.

Unsuccessful ‘lead’ pairs used ‘declarations of lack of understanding’ (for example, “Wat talkin u”), which their counterparts in the successful teams did not at all.

As for the ‘follow’ pairs in the successful teams, they used the following discourse types more frequently than their counterparts in the unsuccessful teams:

- Statements reporting attainment (for example, “Reach le”, “Hav le. Found p” and “We r at hse no.26. jin rumia rd” – these were used once every 5.6 minutes by successful ‘follow’ pairs, compared to once every 6.9 minutes by unsuccessful ‘follow’ pairs; \( t=0.850, p=0.420 \)).
- Procedural questions (for example, “Then hw” and “Wat is nex” – used once every 8.1 minutes, compared to once every 11.4 minutes; \( t=0.850, p=0.420 \)).
Successful ‘follow’ pairs also used the ‘helicopter’ imperative (for example, “Do not give inch by inch detail”), which their counterparts in the unsuccessful ‘follow’ pairs did not at all.

A hierarchical cluster analysis was performed on the various discourse types used by the ‘follow’ pairs, and this resulted in three major categories of discourse, namely ‘fundamentals of learning’ (questions seeking elaboration, procedural questions, and statements or questions seeking to either verify or report attainment), ‘yearnings’ (demands for information and ‘helicopter’ imperatives) and ‘utterances of desperation’. In terms of Laurillard’s (2001) conversational framework, ‘fundamentals of learning’ can be thought of as being used as the “student acts to achieve [the] task goal”, while ‘yearnings’ are used as the student “modifies action in light of feedback”.

### 3.2 Perspectives Task

As for the Structured Academic Controversy task, it was argued in Chapter Three that there is a close fit between the various stages of this task and the model of practical inquiry proposed by Garrison, Anderson and Archer (2001). The practical inquiry model was developed to analyse the discourse modes generated by online conferencing, computer-mediated communication and e-learning in general. It adopts a message-level approach to the analyses of transcripts. Fahy (2002) has adopted a sentence-level approach, arguing for a finer level of granularity. The distinction between the unit of transcript analysis is blurred when applied to the analysis of text-messages, which are limited to 160 alphanumeric characters. Indeed many of the messages sent were far shorter than that.

An analysis of the messages sent during the Structured Academic Controversy tasks showed that of a total of 229 messages, 144 were sent during what Garrison, Anderson and Archer term the exploration phase. This works out to 63 percent of the total number of messages, which is exactly the same percentage that emerged in Garrison et al.’s own work in 2001. Fahy’s study a year later was also consistent with this, with a figure of 62 percent. For the integration phase, 64 messages were sent, which represent 28 percent of the total. The corresponding figures for Garrison et al and Fahy are 19 percent and 14 percent respectively. Finally, for the resolution phase, 21 messages were sent, which represent 9 percent of the total. The corresponding figures for Garrison et al and Fahy are 6 percent and 20 percent respectively.

It would appear therefore that the application of the Structured Academic Controversy in the context of a field-based mobile-telephonically-afforded learning environment does result in a worthwhile contribution to the corpus of research on the model of practical inquiry. The relatively high number of messages sent during the integration phase can be accounted for by the structure imposed by the Academic Controversy task, and is particularly encouraging, given that Garrison, Anderson and Archer specifically point out that integration appears to be “more challenging than exploration” for learners, and as a consequence, “students will be more comfortable remaining in a continuous exploration mode”.

A secondary way in which the data gathered during the Structured Academic Controversy task was analysed was in terms of the subjects of the various photographs which the students took and selected to be incorporated into multimedia messages, as evidence of their respective given perspective. These were analysed in order to gain an insight into the kinds of issues, scenes and objects which the students found meaningful with respect to their given topic. Chandler’s (2002) caution that “just because an item occurs frequently in a text does not make it significant” notwithstanding, the strategy chosen for this part of the study was indeed that of content analysis, as opposed to a more semiotic one. This decision was made because it was assumed that the spontaneous way in which the photographs were taken, and the fact that they were taken by amateurs using relatively simple cameras, would mean that attempts to analyse them from a structural-semiotic perspective (with its consequent presumptions of deliberate compositing and juxtaposition) would be misleading at best.

From this premise, it was therefore interesting that although each of the students in the pilot conducted their structured academic controversy task at one of five different locations, and each location had its discussion topic related to one of the three themes of ‘development’, ‘tourism’ and ‘environment’, there still emerged several common subjects in the photographs which they chose to take, and subsequently to select for incorporation into their multimedia messages as pictorial evidence supporting their respective perspective.

For example, photographs illustrating various forms of pollution, those illustrating flora (both native and alien), and those illustrating related to accessibility and modes of transport were frequently taken by the students, regardless of
whether their given theme was on ‘development’, ‘tourism’ or ‘environment’. Fellow classmates also detected such skews, as evidenced during the peer critique session, with written comments such as “why is all about rubbish and dust bin but not other things to against the question” and “why are all related to pollution”.

These emphases accorded by adolescents to these subjects in particular are most likely explained, not only by prior knowledge from the curriculum, but also by the conditioning they have received throughout their lives so far (in both formal and non-formal educational contexts), that as Singaporeans, they live in a land-scarce nation state with few natural resources of its own. Since independence, the national government has thus needed to attract foreign investment and to plug into the global economy. Two strategies by which it has chosen to do so are to promote Singapore, through high-media-saturation public education campaigns, as a ‘clean and green’ Garden City, as well as to ensure that the country has a world-class public transport infrastructure integrated with carefully-planned policies regulating private-car ownership and usage to prevent gridlock. It would appear, at least from the evidence of the pilot study, that the government has been successful in this regard, and teachers might wish to take these biases in students’ preconceptions about the three topics into consideration when planning their lessons.

On the other hand, there was also evidence that the peer critique sessions afforded sufficient opportunities for students to respond constructively to their peers’ explorations. Written comments such as “why do you think this is so?” (appended beside an extract of a messaging transcript which read “though there is rubbish bin, ppl still any how throw their rubbish”), “construction is common. It is not the government responsibility to protect guilin. It is the citizen responsible” and “should fishing be allowed den” were typical of such exchanges.

4 Conclusion

The intervention was divided into two complementary halves, namely the orienteering task and the perspectives task. The former represented an attempt to hold constant the ‘landmarks’ (that is, the checkpoints) which punctuate the socially-constructed vista space. This was so that the variable to be analysed would be more explicitly the nature of the discourse itself.

Conversely, the perspectives task represented an attempt to hold constant the nature of the discourse (by stipulating a highly structured format for debate – the Structured Academic Controversy), thereby permitting examination of the ‘meaningful landmarks’ variable, inter alia, instead.

One of the primary findings from the orienteering task was the difference in discourse modes used by participants who were successfully able to complete the task, as compared to those who could not. ‘Lead’ pairs in successful teams used ‘instructions’, ‘directed tips’, ‘questions seeking elaboration’, ‘questions addressing misconceptions’ and ‘statements of assurance’ more frequently than their counterparts in unsuccessful teams. Further, a discriminant analysis revealed a group of discourse types – so-called ‘focussing expressions’, corresponding to Laurillard’s (2001) teachers giving feedback to learners – that the former group used significantly more of.

As for the ‘follow’ pairs, those in successful teams used ‘statements reporting attainment’ and ‘procedural questions’ more frequently than those in teams which could not complete the orienteering task in time. Again, a discriminant analysis revealed that the former used significantly more ‘yearnings’ – corresponding to Laurillard’s (2001) learners modifying actions in light of feedback – and fewer ‘utterances of desperation’ than the latter group of participants.

The data from the pilot study was supported by that from the main study, in which almost all participants were able to successfully complete the orienteering task. In the main study, the categories of discourse modes deduced from the pilot study were correlated against the time taken to complete the orienteering task. There was a significant correlation between the time taken to complete the orienteering task, and the use by ‘lead’ pairs of ‘expressions for instruction’ – corresponding to Laurillard’s (2001) setting of task goals. This indicates that as the task progressed, members of successful ‘lead’ pairs persevered in guiding their peers along the given route. They did not give up.

As for the ‘follow’ pairs, there was a significant correlation between the time taken to complete the task and the use of both ‘utterances of desperation’ and ‘fundamentals of learning’. In other words, as the task progressed, members of successful ‘follow’ pairs, while growing increasingly desperate as to their chances of success, nevertheless persevered and used the ‘fundamentals of learning’ – Laurillard’s (2001) actions to achieve task goals – to complete the route within the allotted time. These ‘fundamentals of learning’ include ‘questions seeking elaboration’,
questions seeking purpose’, ‘exploratory and procedural questions’, and ‘statements or questions seeking to either verify or report attainment’. The lessons for teachers and learners would seem to be clear: when faced with a challenge, do not give up but instead continue to ask particular types of questions and give feedback to the teacher about the perceived progress of the learning.

The second half of the intervention, complementary to the orienteering task, was the perspectives task. The primary finding from this part of the study was that the Structured Academic Controversy format can indeed be successfully applied in an online environment in which participants are not necessarily co-located. In my review of the literature, this had not been attempted before. In fact, the very structure of the format provides an ideal conduit for encouraging (or possibly, enforcing) participants in an online discussion to deepen their investigation by moving on from what Garrison, Anderson and Archer (2001) term the ‘exploration’ phase, to the important ‘integration’ phase, in which explicit attempts are made to analyse, critique and build upon whatever information has been put forward to that point. The proportion of messages in the ‘integration’ phase, resulting from the perspectives task, is higher than anything reported so far in similar studies on e-learning and online collaboration.

Further, the perspectives task revealed biases that adolescents in Singapore have in their perceptions of their local environments. This was evidenced by the propensity, especially in the earlier iterations of the task during the pilot study, for participants to view the world around them through green-tinted lenses – that is to say, when tasked to look for evidence pertaining even to issues of development or tourism, participants would regard instances of environmental pollution as suitable subjects to photograph and submit. Such biases are corroborated by Kong (1999, 2000), who has argued that children and adolescents in highly-urbanised Singapore view nature as something which is orderly and well-maintained. She continues that this rather limited perception arises from the fact that nature is “a ‘waste of time’. All the teenage members of the school group acknowledged that nature was not very much a part of their consciousness. When bored and thinking about places to visit and what things to do, the tendency was not to think of activities associated with nature. When thoughts about the natural world did surface in their minds, it was often in the context of school work, for example, their geography lessons, during which nature was more about conceptual issues and scientific processes than everyday environments of potential fun and enjoyment” (Kong, 1999).

References


