Giving shareable form to collective thought using a Shared Thinking approach

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Abstract

This paper introduces the practice and theoretical framework for a new generative learning environment that creates shareable electronic artefacts from reflective dialogue across a whole-group. These artefacts are quantitative and qualitative representations of student experience. By grouping these student-generated products new measures of student experience are created that inform both research and development. This approach, created by the author, is called Shared Thinking. This research is an interdisciplinary PhD study, funded by the Kelvin Smith scholarship, at the University of Glasgow. The PhD is based in the Faculty of Education with supervision shared with Psychology and Computing Science. Collating the different ideas discussed here, this study involves the use of electronic voting systems (EVS) technology in the face to face classroom; the use of a whole-group protocol (specifically a snowball or pyramid group-discussion technique); and the use of voting to generate an electronic shareable synthesis that can function as a mediating artefact (Anderson et al., 2007; Conole, 2008). The snowball group-discussion technique used here works by sharing the individual perspective, firstly by inviting each person to write down their view. Individuals then share their ideas within and between small groups until the whole-class perspective is generated. This protocol works as a thinking routine (Ritchhart & Perkins, 2008) much in the same way as Exploratory Talk (R Wegerif, 2009). The mix of the snowball technique and the use of technology equates to a dialogical space (Mercer, 2000). However, the intention to collaboratively generate a whole-group perspective, as a synthesis of reflective conversations, changes things. This intention creates a learning disposition of collective curiosity and cooperative inquiry (Heron & Reason, 2006). Researchers and subjects work together to produce visible solutions to authentic problems. This learning disposition and the co-construction of a mediating artifact together transform the possibilities for learning, dialogue and participation. The 'dialogical space' becomes a 'generative environment' (Grabinger, 2000) that produces a mediating electronic synthesis for participants and vicarious learners (McKendree, Lee, Dineen, & Mayes, 1998). This is participation-reification as a process and product with all the consequent implications for knowledge-building and management (Wenger, 1998). I have called this new generative environment, and socio-cultural practice, Shared Thinking. This environment contains a space, a structure, a reflective dialogue, a disposition, a purpose and a shareable product. This, in turn, informs the development of a shared understanding of the social, cognitive and developmental context.

Keywords

Group Learning, Collective Learning, Shared Thinking, Cooperative Inquiry, Electronic Voting Systems, Classroom Technologies, Networked Learning, Mediating Artefacts, Constructionism, Generative Learning, Vicarious Learning, Shared Understanding, Diversity

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Introduction

This research is about the externalization of collective thinking. It is about a process supported by electronic voting systems (EVS). By putting this into electronic form it becomes more flexible in the way it can be used by the group and by others. It can also serve as a bridge between different groups and across different spaces.

There are 2 projects that informed my thinking in this research. One of them was 'Thinking Together' (R. Wegerif, Mercer, & Dawes, 1999) for the way it was interested in scaffolding high-order discussion and for the way it highlighted the reciprocal influence of social interaction on individual thinking. Mercer re-conceptualized the Vygotskian notion of scaffolding (Vygotsky, 1978) into a dialogical phenomenon (Mercer, 2000) maintained and supported by the creation of an inter-mental zone of proximal development (Fernandez, Wegerif, Mercer, & Rojas-Drummond, 2001; Mercer, 2000) – a 'dialogical space.' In this space, and through interaction, a shared understanding (Crook, 1996) can be developed. In the Thinking Together project, the creation of a dialogic space is supported by the use of Exploratory Talk. This is a set of ground rules to help participants to interact in this inter-mental and social space. The space and the ground rules work together as a form of overall scaffolding that facilitates inter-mental 'tuning' (Mead, 1934) and learning.

The second project that influenced my work here was 'Making Learning Visible' (MLV). This was about communicating thinking to others in a shareable form. It can be done through speech, images and through documentation (Ritchhart & Perkins, 2008). For example, teachers might draw together the work of different individuals to create a display of the collection. The teacher facilitates the sharing of ideas and the participation of others by creating a display of whole-class work. This class-product creates a social resource – a mediating artifact - for learning conversations amongst both vicarious learners (McKendree et al., 1998) and participants in the generative process. The MLV project talks about 'thinking routines' that help create a 'learning disposition' of curiosity and inquiry. Thinking routines are another form of scaffolding helping to shape the way participants look at an issue together. In some respects Exploratory Talk can be understood as a thinking routine. It consists of a set of ground rules for the way participants conduct their discussion an issue. Thinking routines and Exploratory Talk both shape and support learning and social interaction.

In many respects networked learning has similar ideas of public learning and mediating artefacts that support both dialogue and participation. For example, online conversations, as a process, are captured and shared in a group. Individuals and groups are able to use the transcripts to support further dialogue and thinking. Networked learning is partly defined by the public nature of interaction (McConnell, 2000). Group products are shared online to help participants see 'what they have built together' (Pea, 1994). This likewise scaffolds further discussion and reflection across the network as participation and production help learning with and about each other. This dynamic process of participation and reification (Wenger, 1998) re-appears in the current conversations relating to representations of course designs that use technology (Conole, 2008; Goodyear, 2005; Goodyear & Steeples, 1998). The current conversation relates to formats and granularity etc but what ever form they take, these representations of different designs, also expresses the thinking and experience of a group. They are mediating artefacts that contribute towards the idea of an electronic collection of similar designs informing thinking and practice elsewhere. They are an act of communication back into the group and outwardly to others.

From this discussion, we have the idea of a thinking routine, the idea of an inter-mental space for dialogue and the idea of mediating and shareable artefacts. Alongside this we have the idea of creating a learning

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disposition that fosters a shared sense of inquiry – a purpose as well as a product. We see these ideas in both online settings and in face to face classes. In this study, I want to bring all these ideas together and to show their relevance and application to higher education.

With these ideas in mind, I will use this paper to set out the emerging theory and model of Shared Thinking. This has been implemented and developed across 5 different mini-case studies in higher education. My aim here is to offer a detailed outline of Shared Thinking. Space does not permit discussion of the data or analysis. That task will be part of other publications. Here, I want to set out my conceptual stall. This will follow a brief summary of theoretical perspectives that inform this study.

Background Theory

Piaget's theory of Constructivism describes learning from experience. Put briefly, new experience is reconciled with current knowledge by resolving the tension between them. New mental structures are created as a result. Despite the social aspect of any experience this is typically viewed as an internal process. Vygotsky's theory of Social Constructivism (Vygotsky, 1978) points towards the social influence and the socially embedded nature of learning. Learning is a product and an expression of experience in a social context. Others in that context have a significant influence upon our learning. The gap between what can be done alone and what might be achieved with the support of more knowledgeable others defines the Zone of Proximal Development (ZPD). Papert's theory of Constructionism (Papert & Harel, 1991), as it relates to learning, describes the idea of externalizing our thinking and making it shareable. This is the idea of giving some form to experience and making internal processes visible.

Foreground Theory

In Shared Thinking, the background theories above are adopted and changed. Kilgore's Collective Learning theory (Kilgore, 1999) proposes the idea that groups can also be constructors of knowledge. This theory also highlights the reciprocal influences in terms of identity and learning between individuals and collectives. Through interaction each has an effect, one upon the other. Collective Learning theory also seeks to understand the complexity of difference within groups and to avoid a reductionist view of groups.

Wells has highlighted the idea of an extended ZPD "as an attribute of interaction among participants jointly engaged in a learning activity" (Wells, 1996). Similarly, Mercer, Wegerif and others also highlight the inter-personal spaces in which interaction occurs as dialogical (R. Wegerif, 2007) and inter-mental (Mercer, 2000) in nature. Such ideas serve to highlight the social and conversational nature of interaction the implicit goal of which is to facilitate the creation of a shared understanding (Crook, 1996).

To this is added the idea of a collective view of Constructionism in learning. This refers to the idea of eliciting the thinking of a whole-group and making it shareable. This whole-group expression then becomes a resource for individuals, groups and those outside the originating group. The potential richness of this resource is only limited by a possible lack of diversity within and between groups (Kilgore, 1999). Finally, a sense and process of cooperative inquiry (Heron & Reason, 2006) is seen as a feature of Shared Thinking. This involves helping people in making sense of their lives in a partnership between researchers and subjects. It is a practical approach that seeks solutions to authentic concerns through a shared investigation. In the context of this study, it is also part of a change in learning disposition for the way it orientates the group towards a collective curiosity.

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The Research Context

This research is an interdisciplinary PhD study funded by the Kelvin Smith scholarship at the University of Glasgow. The PhD is based in the Faculty of Education but supervision is shared with Psychology and Computing Science.

A case study approach (Yin, 2003) has been adopted for this study. This is a case study of the use of EVS technology and the snowball group-discussion technique to create a socio-cultural learning environment (SLE) in a 'listening pedagogy' (Rinaldi, 2005). An action research approach was adopted for the development of the overall environment as a model. Such an approach is 'a small scale intervention in the functioning of the real-world and a close examination of the effects of such an intervention' (Cohen & Manion, 1994). This was developed iteratively in cycles across five different settings. These interventions function as mini-case studies in the research strategy. The mini-case studies were:

- Case Study 1: First and Second Year Students in a new University
  Application: Induction and transition
- Case Study 2: First and Second Year Students in an old university
  Application: Induction (a modified design of Shared Thinking by Dr. Quintin Cutts, Computing Science, University of Glasgow)
- Case Study 3: Support staff from different institutions at a Conference Workshop
  Application: CPD for support staff
- Case Study 4: Final Year Students at a new university
  Application: placement review
- Case Study 5: Tutors in an academic department
  Application: CPD for tutors reviewing assessment practices

Towards a Theory of Shared Thinking

The research hypotheses that contribute towards a theory of Shared Thinking are:

1. The use of a protocol that supports the development of ever-widening and visible student-generated perspectives will support a greater sense of the social self. This means a greater understanding of individual identity relative to the social context (Mead, 1934).
2. By constructing an inter-mental space for reflective dialogue that is orientated towards cooperative inquiry and the production of a visible synthesis, attention will be directed towards the shared search for understanding. This is in contrast to competitive learning or a search for the 'right answer.' At the same time this will support linguistic and cultural induction (Bruffee, 1993).
3. The co-construction of a whole-group perspective as an electronic artefact will support and structure participation within a session and across different sessions. It will also facilitate further dialogue both on and off-line. It is an iterative process of participation and reification (Wenger, 1998) for a given group but also across different groups – the community. This is supported by pooling and grouping artefacts derived from multiple sessions.
4. The co-construction of whole-group artefacts adds an additional communicative layer constructed through aggregated dialogue. This is a collective act of communication that speaks back into the generative group and outwards to others as vicarious learners (McKendree et al., 1998).

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5. The goal of showing diversity, rather than a goal of reaching consensus amongst individuals, will provide a richer resource for individuals in terms of developing support for socialisation, learning and participation.
6. Any goal of consensus in Shared Thinking relates more to a consensus (or shared understanding) about the social context as much as it does about a given issue. The mediating artifact serves to portray the landscape rather than any agreement.
7. The goal of facilitating cooperative inquiry that generates a quantitative and qualitative whole group view will simultaneously support research as well as development within the social context. This is achieved in a given single display and by grouping electronic artefacts (Anderson et al., 2007).
8. Mediating artefacts have greater additional powers when considered in relation to other artefacts. Such relations between artefacts include others created by a Shared Thinking process and other digital representations such as those pertaining to course design (Conole, 2008; Goodyear, 2005; Goodyear & Steeples, 1998).

The Shared Thinking Environment

Shared Thinking is a practice, a research strategy, a socio-cultural learning environment and a model. Students collaboratively generate question-options by reflecting upon and sharing their experiences. Shared Thinking is a generative process fostering a 'listening pedagogy' (Paciottie & Bolick, 2009). Figure 1 below shows the Shared Thinking environment derived from 5 mini-case studies of implementation. The key point is that participants are learning about the issues and the social context in which these issues are experienced. The collaborative production of mediating artefacts, in a notional set of networked artefacts, communicates the experience of learners and simultaneously supports research and development.

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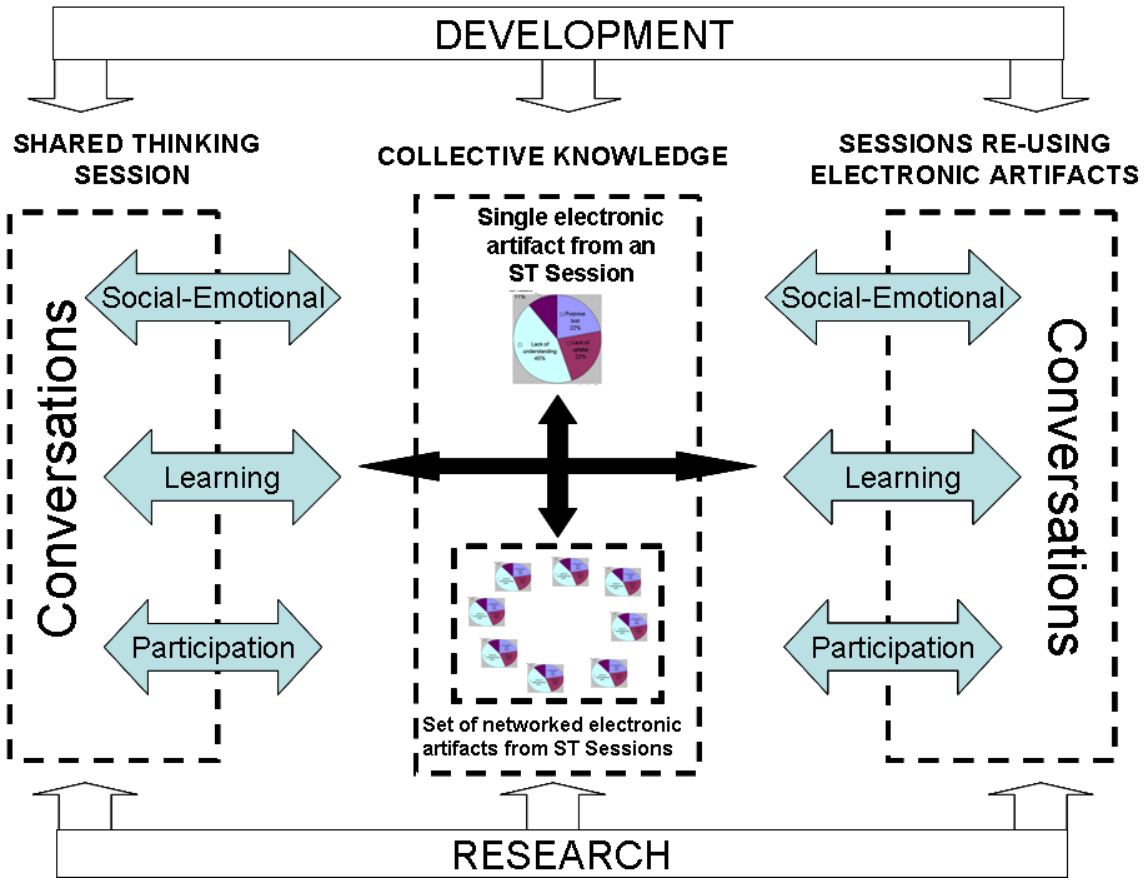

Figure 1: The Shared Thinking Environment

The Shared Thinking environment and model shown in Figure 1 has 3 main parts:

1. The Shared Thinking Session
2. The Collective Knowledge
3. Sessions re-using the electronic artefacts

1. The Shared Thinking Session

The basic recipe for Shared Thinking (below) uses a snowball group-discussion technique as a way of co-constructing ever-widening perspectives. The use of EVS transforms the list into an electronic pie-chart with the issues quantified in relation to each other.

- Individual Questionnaire/Writing – for externalising knowledge to the self, giving form to thought and as preparation for group discussion.
- Small Group Session – to voice initial thoughts, listen to the views and experiences of others and to choose an option to share with the whole-group
- List Construction – to collect and share each group's options which are recorded on the screen and to give a wider perspective(s)

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- Voting – to give individuals a further voice and to enable consideration of the widest perspective available and to transform the text-based list into a graphical and quantified display of the student-generated issues in relation to each other
- Display of Voting Results – the outcome of the individual voting is shown as a pie-chart (or other chart if preferred) providing an electronic and representational document of the whole-group view on a given issue at a point in time.
- Optional Grouping and Re-use of Pie-Charts – done either in the sessions or outside the sessions creating different measures and resources for different conversations and a variety of participants

2. The Collective Knowledge

In practice, within the Shared Thinking session, the resulting pie-chart constitutes a learning resource for all involved. These artefacts were grouped in a single session (Case Study 1); artefacts from two different sessions were compared to create the agenda for a third cross-group session (Case Study 1).

In these mini-case studies of implementation, the grouping of pie-charts and the re-use of them meant carrying them between sessions on a laptop. There is no reason why these anonymous artefacts should not be hosted in a networked database as a collection drawn from different sessions. This would open up the possibility for a variety of research and development applications. It would allow individual learners to compare and contrast the artifact from their session with others generated elsewhere. It would allow groups to use the collection as a workshop resource; and it would allow researchers, tutors and senior management to carry out investigations across departments, faculties and beyond. Each artefact is generated from the sharing of experience that creates qualitative and quantitative data for a year-group. It is a grounded picture of situated student experience that constitutes a huge potential for research and development.

3. Sessions Re-Using the Digital Artefacts

In the mini-case studies listed above, artefacts created in one session were re-used in other sessions (Case Study 3 and 5). In addition, they were circulated on a national email discussion list (Case Study 3) and sent privately to an individual tutor for evaluation (Case Study 4); they were emailed by tutors to the rest of a course team for planning discussions (Case Study 4). Likewise sessions that re-use objects generated elsewhere may or may not include a Shared Thinking approach.

The key point here is the possibility and flexibility offered by being able to draw down from the notional networked collection, or draw from earlier sessions, artefacts created elsewhere. It is equally possible to take a blended learning approach using the pie-charts generated in a face to face session as the starting point for further discussion online. This could involve participants in the generative session plus or minus others as vicarious learners (McKendree et al., 1998). In case study 3, the pie-chart generated in a Shared Thinking session for staff was shared online on an email discussion list. The email list included some of those attending the session and the wider topic-related community. This gave rise to further dialogue and wider participation amongst a highly distributed group. Finally, these resources can also be independently or collaboratively re-used once networked.

Conclusion

Collating the different ideas discussed here, this study involves the use of electronic voting systems (EVS) technology in the face to face classroom; the use of a whole-group protocol (specifically a snowball or pyramid group-discussion technique); and the use of voting to generate an electronic shareable synthesis

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that can function as a mediating artifact (Anderson et al., 2007; Conole, 2008; Goodyear & Steeples, 1998). The snowball group-discussion technique used here works by sharing the individual perspective, firstly by inviting each person to write down their view. Individuals then share their ideas within and between small groups until the whole-class perspective is generated. This protocol works as a thinking routine much in the same way as Exploratory Talk (R Wegerif, 2009). The mix of the snowball technique and the use of technology constructs a dialogical space (Mercer, 2000). However, the intention to collaboratively generate a whole-group perspective, as a synthesis of reflective conversations, changes things. It is argued that this intention creates a learning disposition of collective curiosity and cooperative inquiry (Heron & Reason, 2006). Researchers and subjects work together to produce visible solutions to authentic problems. This learning disposition and the co-construction of mediating artefacts together transform the possibilities for learning, dialogue and participation. The 'dialogical space' thus becomes a 'generative environment' (Grabinger, 2000) that produces a mediating electronic synthesis for participants and vicarious learners (McKendree et al., 1998). This is participation-reification as a process and product with all the consequent implications for knowledge-building and management (Wenger, 1998). I have called this new generative environment, and socio-cultural practice, Shared Thinking. This environment contains a space, a structure, a reflective dialogue, a disposition, a purpose and a shareable product. This, in turn, informs the development of a shared understanding of the social, cognitive and developmental context. Evidence to substantiate such claims will be presented elsewhere in forthcoming publications.

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