



The interrelationship of emotion and cognition when students undertake collaborative group work online: An interdisciplinary approach

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ABSTRACT

In order to determine how emotions and cognition are experienced during collaborative group work online students' descriptions of their learning experience were interpreted using a qualitative approach. A common feature of these accounts was reference to difficulties and problems. Four main themes were identified from this data set. Two of the themes, '*Constraints on autonomy*' and '*Reflections about collaboration*', encapsulate the experience of engaging in group work. The other two themes '*Virtual others*' and '*Communicating online*'. The '*impact on progress and achievement*' provide some insight into what is unique about the socio-emotional experience of collaborating online and how it can influence motivation and learning. The findings were considered from two perspectives of the role of emotion in learning: the socio-cognitive model of self-regulated learning and the community of inquiry framework (COI). An interdisciplinary approach was adopted by taking into account recent research in social cognitive neuroscience. Some practical recommendations about the deployment of technologies for group work online and for empowering students' understanding of the value of collaborative learning are made. The value of verbal immediacy practices as a way of counteracting the disembodied nature of the relational experience of others online is discussed.

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1. Introduction

When a learning context supports the exchange and discussion of ideas there is the opportunity for each individual to assimilate new information and to build on their current understanding by accommodating the ideas of other students (Hodgson, 2002; Laurillard, 2002). By including a requirement that learners collaborate on a shared task there are some additional pedagogical benefits. The process of co-constructing an artifact together with other students provides each learner with an opportunity to reflect on practice and to adapt practice (Laurillard, 2009, 2012). The development of technologies such as forums, wikis and virtual worlds, has meant that group work can take place online. Text based forums and wikis allow for asynchronous communication and therefore offer the practical advantage of flexibility as to when and where engagement with the group and the shared group task takes place; there is no requirement for participants to be co-located. For distance learners, and the tutors who support them, the impact of these technologies has been profound. Institutions can now offer opportunities to connect and learn with others at a distance in a way that was not possible previously (Gaskell, 2009). The availability of these technologies also means that workspaces are increasingly distributed and federated and there are many informal online spaces where collaboration can take place. For example, by using wiki technology 'thousands of dispersed volunteers can create fast, fluid and innovative projects that outperform those of the largest and best financed enterprises' (Tapscott & Williams, 2006, p. 65). Enabling students to acquire the competence to communicate and collaborate by using digital technologies benefits economic and social capital and opens up career opportunities (Ala-Mutka, 2011). Organizations and businesses increasingly seek to recruit employees who have the ability to collaborate and work effectively within a team, including online.

However, there is a discrepancy between the conceptual view that values collaborative activities as a way to develop critical thinking and the empirical evidence that takes account of the student perspective. Some students view group work with hostility and apathy (Roberts & McInerney, 2007) and find it frustrating (Capdeferro & Romero, 2012). Such negative views are not confined to online group work. Findings based on an analysis of the survey responses of students who had undertaken group work face-to-face led Burdett to conclude that 'group work can be hard both emotionally and intellectually' (Burdett, 2003, p. 179).

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The objective of this study is to carry out a qualitative analysis of students' accounts of experience with group work online in order to further our knowledge of their emotional and learning experience when required to engage in a shared task remotely using computer mediated communication (CMC).

2. Learning and the role of emotion

This section draws exclusively on those theories of the role of emotion in learning that take into account contexts that are both interpersonal and virtual. There are two theories that fulfill these criteria the socio-cognitive model of self-regulated learning (Bandura, 1997) and the community of inquiry (COI) framework (Garrison & Anderson, 2003; Garrison, Anderson, & Archer, 2010). In the concluding chapter of a recent book devoted to critical review of the role of emotion in education the editors call for inquiry in this research area to integrate and enlarge theoretical perspectives (Pekrun & Schutz, 2007). They are not alone in advocating that the time has come to consider a trans-disciplinary and multilevel approach for educational research (Bransford et al., 2006; OECD, 2007). Therefore a brief review of recent developments from the relatively new area of social cognitive neuroscience (the use of neuroscience methodology to study social cognition) is also included in this section.

2.1. A socio-cognitive model of self-regulated learning

Bandura (1997) proposed an account of how we learn based on our capacity for observing others and our access to symbolic modes of communication; that we learn through observing, modeling and speaking with others. This social-cognitive model takes into account both the subjective influences that learners bring to a learning situation and the influence of emotion. In this model factors such as self-efficacy and beliefs about task value combine with encounters in the learning environment to mediate emotional experience. The emotions evoked are conceptualized as both an outcome and then, in turn, a causal factor that influences the way in which cognition and learning strategy are mediated by the learning context (Bandura, 1997, 2006; Pekrun, 2006). Agency, the ability of people to self-regulate and reflect, is a key element of the socio-cognitive model. Another important element is self-efficacy; Bandura (2006, p. 121) attributes 'staying power', the way that some students persist despite problems and setbacks, to self-efficacy. This model takes into account that people do not exist in isolation that they need to engage in collective agency including in online contexts 'individuals who are assured in their efficacy to manage the Internet technology are the ones who take advantage of this expansive environment' (Bandura, 2006, p. 119).

2.2. The community of inquiry (COI) framework

The COI framework specifically addresses the socio-emotional aspects of online discussion (Rourke, Anderson, Garrison, & Archer, 1999). The COI framework proposes that in order to successfully interact and communicate within online forums learners will need to adapt communicative practice so that their online presence will be perceived in a way that allows the trustful relationships that support and enhance collaboration to develop. The development of the COI was influenced by assumptions that when learning online there are some unique elements, in particular a sense of the 'realness' of other participants, that determine the quality of the learning process (Garrison & Arbaugh, 2007). Therefore the COI focuses on how teachers and students present as 'real' in online contexts and in particular the relational aspects of 'realness', that set and maintain a suitable climate for learning and support the discourse in online text based forums. The model conceptualizes 'realness' as presence and assumes that participants 'must strive to recreate the social and knowledge building processes that occur via moment by moment negotiation of meaning' (Shea et al., 2010, p. 10). The COI has as its main focus the influence of three elements, social presence (Rourke et al., 1999), teaching presence (Anderson, Rourke, Garrison & Archer, 2001) and cognitive presence, that can combine in a way that supports a worthwhile educational experience when using text based forums (Garrison, Anderson, & Archer, 2000). Proponents of the COI model argue that when social and teaching presence are satisfactory then the student learning experience is both emotionally satisfactory and pedagogically productive despite the disembodiment of all interpersonal interaction.

The provenance of these two perspectives of emotion and learning are very different. However, they are complementary in that both affirm that emotion and cognition interrelate and therefore support the view that emotional factors should be taken into account in learning design. Both perspectives recognize the influence of elements within the learning environment on emotional experience but conceptualize the motivational force as residing within the individual.

2.3. Social cognitive neuroscience and the embodied manifestation of emotional experience

An area of social cognitive neuroscience research that is relevant has as its focus the potency of the communicative cues of co specific for influencing the experience of emotion. It takes an interdisciplinary perspective to explore psychological constructs such as mentalizing (making inferences about the mental states of others) and empathy (the capacity to understand the thoughts and feelings of someone else) during face to face encounters (Walter, 2011) and in narrative texts (Coplan, 2004). This perspective takes the view that the mode of communication has implications for the way that interpersonal relationships are experienced. When learners are required to do group work online the co-presence of other members and communication with them is mediated by technology. They do not have access to non-verbal communication cues and they rarely engage in discussion concurrently. The implications of this altered sense of co-presence for the collaborative process can be usefully considered from a social cognitive neuroscience perspective by drawing attention to the contrasts between the relational experience of face-to-face encounters, imaginary encounters with fictional characters, and online (disembodied) encounters.

3. Emotions and their sources: group work and technology

Conflict can be a source of emotion and emotions can cause conflict. In this section the inherent conflict that results from the transactional processes involved in doing group work, whether taking place face-to-face or online, will be described and discussed in the context of what is involved when learners are required to undertake a collaborative task. Frustration is another emotion that is considered in some

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