Collaboration in Online Communications

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INTRODUCTION

Collaboration and cooperation have become firmly established as teaching methods in face-to-face classes (e.g., Johnson, Johnson, & Smith, 1998). They are also rapidly becoming widespread in online teaching and learning in both hybrid (mixed traditional and online) course and distance courses. The methods are likely to be most effective if they are firmly grounded in how people actually work together. Some groups collaborate more successfully than others. Frequently, instructors may place students into groups in the expectation that they will collaborate without a clear idea of what collaboration is or how to recognize and encourage it. We must define what we mean by the terms, both so that we can use the techniques successfully and so that we can research them accurately.

In addition, we must distinguish between groups in which people act independently from those who act collaboratively. As Surowiecki (2004) has pointed out, when all the results are aggregated, a large number of people acting independently may give a more accurate solution to a problem than an expert. Interdependent groups may often produce results inferior to the results obtained by their best-performing members or may be affected by a "groupthink" mentality.

Some writers (e.g., Dillenbourg, Baker, Blaye, & O'Malley, 1996) distinguish between cooperation and collaboration. Cooperation, sometimes called "divide-and-conquer," is defined as individuals in a group dividing the work so that each solves a portion of the problem. Collaboration is the interdependence of the individuals of a group as they share ideas and reach a conclusion or produce a product. If a group of students were given a story to write, its members could cooperate by each being assigned to write a portion of the story and then stitching the parts together. To collaborate, the students would discuss each part of the story, contributing ideas and discussing them until they reach consensus, and then write the story together. Individuals in cooperative groups may compete to produce the best portion of the project. Individuals in collaborative groups cannot compete against one another because they are accountable for the product as a group. Collaborative groups, by definition, share ideas and develop them into new products.

Some instructors use a hybrid technique that involves dividing the class into groups and assigning tasks to be done, with either the students or the instructor choosing the roles. The whole group is then graded on the outcome. Thus, the entire group is accountable for an individual's efforts, and there is no provision for compensating for a slacker. If one participant fails to complete his or her task, then no one else can step in to complete it. This type of cooperation/collaboration may only provoke resentment and anger and, therefore, it should be avoided.

Collaboration places more challenging demands on individuals than cooperation. Readers actively construct mental representations of text (situational models) to understand situations and make predictions, using a combination of the information in the text and prior knowledge and beliefs (Kintsch, 1994). In a cooperative group, individuals only need to create an adequate situation model of the problem described to submit a solution. In a collaborative group, members must create a situation model and share it with the group. Each must also develop an understanding of the models of other participants so that the group can develop a shared solution.

To study collaboration, we must look closely at the patterns of communication within groups. This is easier to do with text-based online groups than with face-to-face ones, both because there is a permanent record of all interactions and because there are fewer variables in a text-based online discussion (which does not include intonations, facial expressions, and body language). Collaboration cannot occur unless there is

roughly equal participation among group participants. Group members must actively respond to one another. If not, they may talk past one another, never reacting or changing as the discussion progresses. The product of the group must be a synthesis of ideas from all the group members. Without these three key characteristics, group interaction may be many things, but it is not collaboration.

ONLINE COLLABORATION

The rise of computers and networks has led to new means of computer-mediated communications (CMC). In synchronous CMC, all participants are online at the same time, while asynchronous CMC occurs without time constraints. Synchronous discussion uses chat rooms, instant messengers, or audio and video programs to enable participants to exchange messages in real time. Because of the swift exchange of messages, synchronous discussion may be best suited for brainstorming and sharing ideas. In asynchronous discussions, such as occur over e-mail or threaded Web discussion, students participate at any time and from any location. Participants have more time for considered opinions (Kaye, 1992) and to engage in deeper discussion of ideas (Smith, 1994). Participants are better able to contribute to the discussion equally.

We (Hathorn & Ingram, 2002b; Ingram & Hathorn, 2005), developed analyses specifically for asynchronous CMC using a threaded Web discussion board, where messages are arranged under defined topics, enabling students to add to the discussion with a new message to a series or "thread." These methods are explained in more detail and demonstrated briefly elsewhere in this Encyclopedia.

Web-based discussions allow instructors to use instructional strategies in which students solve complex real-world problems. When the groups are successful, learning takes place and students acquire new knowledge and the ability to apply it. The use of text-based messages enables reflection and rethinking of prior knowledge as students ask questions and discuss ideas. In productive discussions, students reflect on ideas while they develop their reasoning abilities through discussion, reading, and analysis (Pugh, 1993).

We have identified three critical attributes of a collaborative group: interdependence (Johnson et Al., 1998), synthesis of information (Kaye, 1992), and independence (Laffey, Tupper, Musser, & Wedman, 1998). These three factors can be used to operationalize the definition of collaboration for research.

The interaction in a group provides insight into how individuals learn through sharing information and testing ideas (Henri, 1992). A key element is the interdependence of the individuals in the group as they work towards the common goal (Kaye, 1992). Positive interdependence leads to individuals promoting learning in others rather than obstructing it (as in a competitive group) or ignoring it (as in a collection of individuals). The individual's goal cannot be achieved unless the group goal is accomplished (Johnson et al., 1998; Kaye, 1992). Each participant is responsible for contributing to both the other members' knowledge base and the group project. This process involves offering, challenging, and defending information and experience and making concessions and compromises. Interaction requires participation by all members, responding to one another during the discussion**.**

The second characteristic of collaboration requires that the group generate a product distinct from the individual contributions of its members. Collaboration must include the creation of new insights during the discussion (Henri, 1992; Kaye, 1992). For collaboration to occur, the group should have a shared goal that requires the *synthesis* of shared information and ideas. When successful, this creates a product different from any that the individuals could have produced alone.

The third requirement of a collaborative group in education is that the group should be independent of the instructor. This is often difficult for students who are accustomed to referring questions and problems to the teacher rather than using their own resources to find solutions (Laffey et al., 1998). They may try to keep the instructor in the role of knowing all the correct answers instead of developing problem-solving skills with peers (Kaye, 1992). Unless they overcome this tendency, they cannot be a truly collaborative group. Participants and the instructor are all responsible for fostering independence. The instructor must be available for questions but not intrude on the discussion unless collaboration fails.

How can we measure the amount of collaboration in a group, using the three elements of interdependence, synthesis, and independence? It is not possible to use one measure to categorize groups definitively