Effects of within-class ability grouping on social interaction, achievement, and motivation

MOHAMMAD SALEH, ARD W. LAZONDER & TON DE JONG
Department of Instructional Technology, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands (E-mail: a.w.lazonder@utwente.nl)

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Abstract. This study examined how grouping arrangements affect students’ achievement, social interaction, and motivation. Students of high, average and low ability were randomly assigned to homogeneous or heterogeneous ability groups. All groups attended the same plant biology course. The main results indicate that low-ability students achieve more and are more motivated to learn in heterogeneous groups. Average-ability students perform better in homogeneous groups whereas high-ability students show equally strong learning outcomes in homogeneous and heterogeneous groups. Results on social interaction indicate that heterogeneous groups produce higher proportions of individual elaborations, whereas homogeneous groups use relatively more collaborative elaborations. In the discussion, these differences in social interaction are used to explain the differential effects of grouping arrangements on achievement scores. Practical implications are discussed and topics for further research are advanced.

Keywords: collaborative learning, group formation, social interaction

Introduction

The concept of collaborative learning has been studied for over 30 years. Despite this long-standing history there is still some controversy over the exact definition of “collaborative learning”. By and large, the term refers to a pedagogy in which students of equal status work together in small groups toward a common goal. This form of teaching and learning has repeatedly been found to lead to educational advantages over individual learning methods. One of the most salient benefits which can be interpreted from the literature on collaborative learning is the increase in academic achievement (Johnson et al., 1986; Slavin, 1995). Other studies have demonstrated facilitative effects from collaborative learning on social and communication skills as well as on student motivation (Johnson & Johnson, 1999).

While the superiority of collaborative learning is well-established, there appears to be no single best way to divide students into learning
groups. The most widely studied issue underlying group composition is whether groups should be composed of students who are similar or dissimilar in ability. Lou et al. (1996) reviewed twelve studies comparing the effects of homogeneous ability grouping to heterogeneous ability grouping. Their meta-analysis revealed that the effects of group ability composition are different for students of different relative ability. Low-ability students learn more in heterogeneous groups, average-ability students achieve more in homogeneous groups, and high-ability students learn just as much in either group.

Social interaction might be the key to understanding these differential effects, especially because it is generally considered an important meditational factor in small-group learning. From an epistemological viewpoint, two lines of interpretation have emerged. The first dwells on the notion that group learning stimulates peer elaboration. Giving explanations encourages a student to clarify and reorganize the material to make it understandable to others. Such elaborative talk helps both parties to understand the material better. The gains for the students receiving explanations are self-evident. The explainer benefits from the cognitive restructuring involved in peer tutoring in that it might trigger the detection and repair of misconceptions and knowledge gaps (e.g., Webb & Palinscar, 1996). The second interpretation emphasizes the role of peer interaction in the social construction of knowledge. According to this view, knowledge is being co-constructed by group members on the basis of equal partnership. Students construct a shared understanding of a given topic by building on each other’s ideas, discussing the significance of personal beliefs until mutual agreement is reached (Damon & Phelps, 1989; Slavin, 1995). The knowledge basis that results from these argumentative discussions is synergetic by nature and shared by all group members.

It is not the mere production of talk that mediates the construction of knowledge. Learning dialogues should include specific types of verbalizations for peer elaboration and co-construction to occur. Although both processes are elicited by the same kinds of verbal behavior, namely asking and answering of questions, reasoning and conflict resolution, they differ in focus. Peer elaboration pertains to the individual knowledge construction that results from group interaction, whereas co-construction focusses on the way in which a group of students interacts to come to a shared understanding of the subject matter. Van Boxtel (2000) united both perspectives by considering elaboration as a social process that can be either individual or collaborative. Individual elaboration occurs when only one student answers a question, solves a conflict or reasons about the subject matter. In collaborative elabora-