Academic Risk-Taking and CSCL

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Abstract

Risk shift is a group consensus achieved through social interaction which tends to be more risky than the average decision of the individual members of the group. In the present study, the principle of risky shift was constructively applied to 137 elementary students working with a computerized mathematics task to increase their academic risk-taking behavior. Results of the study show that the observed risky shift in the educational situation was most likely caused by the problem-solving information shared among group members. It is proposed that an integration of risk-taking and computer supported collaborative learning environment will benefit students' learning and cognitive development.

Keywords — academic risk-taking, collaborative learning, drill-and-practice computer program, mathematics, modeling, self-efficacy.

1. Perspectives and Theoretical Framework

Psychologists have been explaining the risk shift phenomenon with several hypotheses. "Diffusion of responsibility" theory explains risky shift in terms of group members' feelings that in the case of failure, the entire group, rather than the individuals, will be blamed. "Value" theory contends that risk-taking is regarded as a valuable characteristic in American society; that group members tend to manifest a risky opinion as part of their cultural conditioning. "Familiarization" theory suggests that in a group, members have an opportunity to obtain more information about tasks, situation, and strategies, so they become bold in decision-making.

Guided by psychological theories and research, academic risk-taking has been demonstrated as a means to enhance students' learning and motivation. It has been postulated and demonstrated that moderate risk-taking maximizes satisfaction (Atkinson, 1957), enhances self-efficacy (Bandura, 1977, 1986), elicits constructive attributions (Meyer, Folkes, & Weiner, 1976), provides valued competence information (Trope, 1975), and ensures attention, concentration, persistence, and process-orientation (Csikszentmihalyi, 1990). Recent research has identified several task-related and individual difference variables, such as task objective, task criterion, task familiarity, payoff, and tolerance for failure, that affect risk-taking (Clifford, 1991). One variable that has not been explored is social environment of risk-taking, in particular a computer supported collaborative learning (CSCL) environment.

Social cognitive theorists contend that people can acquire knowledge, skills, strategies, beliefs, and attitudes by observing and imitating models (Bandura, 1977; Schunk & Gunn, 1985; Zimmerman & Ringle, 1981). They also demonstrated that both live models, who appear in person, and symbolic models, which are presented via instructions or audiovisual displays, are influential in observational learning. It can be expected that we can increase students' risk-taking by presenting a risk-taking model.

Another social environment variable is the social context of risk-taking, that is, whether the risks are taken individually or collaboratively. Based on research of risky shift (Harrell, 1991; Knowles, 1976; Turner & Cashdan, 1988; Wallach, Kogan, & Bem, 1964), it can be predicted that students will take higher risks in a collaborative risk-taking situation than in an individual risk-taking situation. This collaborative learning situation can be easily created and supported by using a computer as a learning tool.

General findings concerning the effectiveness of CSCL have been widely published. While King (1989) found no significant relationship between group ability level and success in a study of fourth graders engaged in computer-assisted problem solving, she did identify different patterns of verbal interactions between groups who were successful or unsuccessful in solving the problems. Hooper and Hannafin (1988) formed homogeneous or heterogeneous groups of low- and high-ability eighth grade students to complete a computer-assisted mathematics tutorial. Low-ability students in heterogeneous groups consistently outscored low-ability students in homogeneous groups. In a similar study with high- and average-ability fifth and sixth grade students, re-