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Educational motivation and students' achievement goal orientations

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Abstract

This paper aims to enhance teachers' understandings of the nature and importance of students' achievement goal orientations in elementary mathematics education. In particular, the study includes a theoretical background about what achievement goal orientation is, and the nature of students' goal orientations. Next, a literature review is provided about the major models identified in goal theory. Then, a discussion is made about why achievement goal orientations are important in mathematics education, supported with the research findings in the literature. Finally, a conclusion is made to summarize the main arguments discussed in the previous parts, with specific suggestions to mathematics teachers.

Keywords: Achievement goal orientation; motivation; mathematics education; teacher education.

1. Introduction

Many psychologists and educators have long considered students' motivation as an important factor for successful school learning (Ryan & Connell, 1989). Since the early 1970's, there has been a sustained research focus on how students' motivation impact learning and classroom performance (Linnenbrink & Pintrich, 2002). Research in this area has pointed out that students' motivation predict both the quality of engagement in school learning (Ames, 1992) and the degree to which students seek out or avoid challenging situations and persist in the face of difficulties (Elliott & Dweck, 1988). Especially, in recent years, education professionals have been interested in one type of motivation referred to as achievement motivation (Ames, 1992), which is concerned with what, why, and how students are motivated in different learning situations (Pintrich, 2005). Within this literature, achievement goals, also referred as "purpose goals" (Pintrich, 2005, p.473), are related with the whys of students' learning. They are based on students' beliefs about what is important in an achievement situation (Ames, 1992). For example, a student may try to learn mathematics to pursue the goal of increasing his or her competence in mathematics, whereas another student may learn mathematics to display ability or avoid unfavorable judgments about his or her competence (Elliott & Dweck, 1988).

Achievement goal theory posits that students' behavior in an achievement setting is guided by the achievement goals they construe for learning (Ames, 1992; Pintrich, 2000), and these goals determine their approach to,

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engagement in, and evaluation of performance in school learning (Urdan, 1997). Yet, the adoption of achievement goals is a dynamic and multifaceted phenomenon (Linnenbrink & Pintrich, 2002), which is a situated and domain specific variable depending on the instructional efforts and contextual characteristics of the learning environment (Linnenbrink & Pintrich, 2002). In particular, students adopting different achievement goals can be seen as approaching a situation with different concerns, asking different questions, and seeking different information (Dweck & Elliott, 1983). Achievement goal theory sustains that students' achievement goals are what best explains their cognitions, behaviors, and motivation in learning (Urdan & Maehr, 1995), and a large body of research has demonstrated the validity of using achievement goal theory to understand and promote adaptive behaviors in learning (Meahr & Anderman, 1993; Pintrich & Schunk, 1996).

2. The major models of achievement goal orientations

In literature, two major goal orientations have been identified that function in an achievement situation: mastery goal orientation and performance goal orientation (Ames, 1992; Dweck, 1986; Nicholls, 1984). These two goal orientations have alternatively been labeled as 'task-involvement goal orientation' and 'ego-involvement goal orientation' (Nicholls, 1984) or 'learning goal orientation' and 'performance goal orientation' (Dweck, 1986), respectively. Yet, even if the terminologies differ, the primary difference between these two types of goal orientations is whether learning is valued as an end in itself or as a means to reach some external goals (Meece, Blumenfeld, & Hoyle, 1988). In particular, students with mastery goals focus upon the task, and prefer situations where they can expand new skills and knowledge (Nicholls, 1989). They usually evaluate themselves using "self-referenced standards" (Ames, 1992, p. 262), such as Have I learned? Have I improved? (Pintrich, 2000). On the other hand, students with performance goals focus upon the self, and prefer situations where they can demonstrate their ability and compare it with other students (Nicholls, 1989). These students usually evaluate themselves using interpersonal norms, such as Did I do better than other students in the class? Do others think that I am smart? (Pintrich, 2000).

Many studies have revealed that a mastery goal orientation is associated with adaptive pattern of achievement related outcomes, such as having high levels of self efficacy and interest (Middleton & Midgley, 1997); holding positive attitudes in relation to tasks and the self (Turner & Patrick, 2004); persisting longer on difficult tasks (Elliott & Dweck, 1988); asking help from peers (King, 1992); and using various metacognitive and self regulation strategies (Urdan & Midgley, 2003). On the other hand, findings on performance goals is somehow mixed (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Pintrich, 2000). A number of research findings relate performance goals with adaptive learning outcomes, whereas some others relate with maladaptive outcomes. At this point, goal theorists decided to separate performance orientation into two dimensions: performance approach and performance avoidance (Elliot & Church, 1997; Harackiewicz Barron, & Elliot, 1998; Middleton & Midgley, 1997). This distinction fundamentally bases upon whether students want to look competent or avoid looking incompetent at their schoolwork (Harackiewicz, Barron, & Elliot, 1998). Research conducted according to this new distinction points out that performance approach goals do associate with adaptive achievement behaviors, such as high levels of self efficacy (Elliott & Harackiewicz, 1996), task persistence, and strategy use (Wolters, 2004). On the other hand, research on performance avoidance goals shows that holding these goals is associated with a range of maladaptive behaviors, such as low levels of self efficacy (Elliott & Harackiewicz, 1996), use of self handicapping strategies, avoidance of help seeking behaviors (Kaplan et al, 2002), and low task engagement (Elliot, 1999).

Recently a number of goal theorists started proposing a multiple goal perspective, suggesting that students pursue more than one achievement goal at a time (Pintrich, 2000).Yet, they could not reach a consensus about how to conceptualize multiple goals. For example, it is not clear whether multiple goals should be considered as having three to four separate achievement goals together, or as having achievement goals related or connected in some manner (Ng, 1999). To date, the nature of multiple goals and their relation to educational outcomes remains as an unanswered question (Midgley, Kaplan, & Middleton, 2001; Harackiewicz et al., 2002), and there is a lack of a theoretical framework as well as methodological practices guiding the treatment of multiple goals (Ng, 1999). Thus, so far, among different theoretical accounts regarding the nature and number of achievement goals, the one proposing mastery, performance approach, and performance avoidance goals is assumed to be the most prevalent achievement goal framework (Elliot, 1999; Elliot & Church, 1997), and has received the strongest empirical support in literature.

3. Significance of achievement goal orientations in mathematics education

Nowadays, mathematics is regarded as not something which is passively learned, but as something which students do (Dilworth, 1996). In this regard, the focus of mathematics education has shifted from the development of mathematical competence to prepare completely functioning and caring learners who are capable of pursuing their academic goals (Pajares, 2001). Regarding that students' achievement goals are mediators for their learning, and different achievement goals result in "different ways of approaching, engaging, and responding to achievement situations" (Pintrich & Schunk, 1996, p. 234), it is highly important to understand how students set goals for their mathematics learning and how these goals relate to their academic outcomes. In this aspect, achievement goal theory strongly emphasizes that students' achievement goals are what best explains their cognitions, behaviors, and motivation in learning (Urdan & Maehr, 1995). Thus, students' development of mastery goal orientation should be an essential goal for all mathematics teachers. However, especially in the field of mathematics education, research shows that many students perceive mathematics as a difficult and scary subject matter in which they fail to succeed (Urdan, 1997). So, how can students focus on the mastery of learning mathematics? Although, the reasons students engage in academic tasks have implications for how and what they learn (Stipek, 2002), it is important to realize that students "are not social isolates of the influence of those around them" (Bandura, 1997, p. 469).

In fact, students develop achievement goals in some way according to the broader social and psychological atmosphere in which they learn (Ames, 1992; Meece, 1991). Especially, students adopt achievement goals that are parallel to the goals of their teachers (Turner, Midgley, Meyer, Gheen, Anderman, Kang, 2002). In particular, when students believe that their teachers focus on the mastery of learning and emphasize deep understanding of the learned material, they tend to hold similar attitudes and adopt mastery goals for that subject matter (Bong, 2001). On the other hand, when students feel that their teachers highly promote competition and reward better performance, they internalize these values and adopt performance approach or performance avoidance goals for that subject matter (Ryan, Gheen, & Midgley, 1998). Especially, with regard to mathematics education, research has documented that the nature of mathematical tasks, classroom norms, and the nature of teacher practices highly influence students' reasons to learn mathematics (Meyer & Turner, 2002; Pape, Bell, & Yetkin, 2003; Turner et al., 2002). In fact, many educational psychologists choose to situate motivation research specifically in mathematics classroom, because the characteristics of many mathematics classrooms appear to facilitate maladaptive patterns of motivation (Ryan & Patrick, 2001). In this aspect, research indicates that teachers tend to teach mathematics in the manner they were taught (Brown & Smith, 1997), and most of the teachers were taught by traditional approaches that were performance oriented, which encourage the adoption of performance goals (Anderman et al., 1999; Nicholls et al., 1989).

4. Promoting the adoption of mastery goals in mathematics education

If mathematics teachers would like to improve the achievement levels of their students, they may need to screen and inspire the type of achievement goals their students pursue. It is generally acknowledged that powerful learning environments advance the adoption of mastery goal orientations (Boekaerts, 1999), mainly because holding mastery goals is generally associated with adaptive pattern of achievement related outcomes (Middleton & Midgley, 1997; Urdan, 1997). In this aspect, research points to a number of classroom variables and instructional practices that can promote the adoption of mastery goals. These practices include task design, distribution of authority, recognition of students, grouping arrangements, evaluation practices, and time allocation (Ames, 1992; Epstein, 1988). These dimensions can be used to change how students are taught mathematics and the way mathematics classrooms are organized to benefit student learning and development (Ames, 1992; Epstein, 1988).

In particular, regarding the task design, if students find that the instructional material is varied, have a functional value, and appeals to their individual interests, this may give them intrinsic motivation to learn (Deci, Vallerand, Pelletier, & Ryan, 1991), and increase their task enjoyment (Boekaerts, 1999). Next, regarding the distribution of authority, teachers can support student autonomy by minimizing external controls, having students to participate actively in planning and making decisions, and dealing with the consequences of their decisions (Ryan, Kuhl & Deci, 1997). Regarding the evaluation practices, if teachers make evaluation private rather than public, and consider students' mistakes as part of their learning, this may reduce the influence of social comparisons among students and decreases their fear of failure (Snow & Jackson, 1994).

In addition, too often teachers ask questions that have only one correct answer or can be answered with a simple yes or no response. If the student does not immediately give the expected answer, the teacher either asks to another student or directly provides the answer. This type of discourse is not supportive for fostering mastery goals (Turner et al., 2002). It sends the message to students that having the correct answer is all that matters. Instead, teachers can provide some additional wait time, ask guiding questions, or divide the task into smaller parts that build up to the original question. In addition, teachers should be careful about the kind of message they give when students give incorrect answers. If the teacher gives the message that making mistakes is a natural part of the learning, students might consider mistakes as their learning opportunities. To do this, students might be allowed to find their own errors. In a similar vein, too often students just want to get the right answer in order to get a high score. They are usually not interested in understanding the concepts, but interested in memorizing some formulas or procedures to solve problems. However, for the purpose of learning mathematics, whether the answer is correct or not should be less important than the thinking process used to solve the problem. To promote learning for its own sake, teachers should stress the importance of understanding the concepts by relating them to students' daily lives and asking meaningful problems. Finally, practices such as posting lists of grades arranged in order from highest to lowest, or grading on a curve would only stress competition among students. In order to foster mastery of learning, grading should stress self-improvement and teachers should provide substantive and constructive feedback, which involves more than just an indication of right or wrong answers.

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