

# CLASSROOM ASSESSMENT ENVIRONMENT, SELF-EFFICACY, AND MASTERY GOAL ORIENTATION: A CAUSAL MODEL

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## ABSTRACT

Uncovering how classroom assessment influences students' motivational beliefs is important for understanding how to create classroom environments focusing on learning and mastery. Using research on classroom assessment and academic motivation, the current study used path analysis techniques to test a model explaining the impact of classroom assessment environment on students' academic self-efficacy and mastery goal orientation. The study looked at the direct effects of the classroom assessment environment on mastery goals as well as the mediating effect of self-efficacy on mastery goals. Data were collected from 242 undergraduate students enrolled in an educational psychology course in the College of Education at Sultan Qaboos University during the Fall 2008 semester. The literature was consulted for measures of classroom assessment environment (e.g., Alkharusi, 2008; Church et al., 2001; Wang, 2004) and self-efficacy (e.g., Greene et al., 2004; Midgley et al., 2000). Mastery goals were measured using items from Elliot and Murayama's (2007) Achievement Goal Questionnaire-Revised (AGQ-R). The observed data strongly supported the hypothesized model. It was concluded that students' perceptions of the classroom assessment environment have both direct and indirect effects, which may be positive or negative, on their motivational beliefs. The contribution and relevance of the results to teaching, learning, and research are discussed.

## KEYWORDS

Classroom assessment, Learning environment, Classroom environment, Self-efficacy, Mastery goals, Student motivation, Path analysis

## INTRODUCTION

The purpose of this study was to test a causal model that explains the impact of classroom assessment environment on students' academic self-efficacy and mastery goal orientation. The model demonstrates how different types of the classroom assessment environment directly and indirectly influence students' adoption of mastery goals. The conceptual foundation for this model is a synthesis of previous research on classroom assessment, self-efficacy, and mastery goals. A review of this previous research is first discussed followed by the causal model guiding the present study.

### *Mastery Goals*

Goal orientation, defined as a student's purpose for engaging in academic behaviors, has been regarded as one of the prominent components of academic motivation (Midgely et al., 2000). When students' goal orientation is mastery, they are likely to persist in the face of difficult events, seek challenging activities, have high intrinsic motivation, employ deep study strategies, have long term retention of information, and display appropriate help seeking behaviors as well as adaptive attributional patterns of success and failure (Ames, 1992b; Dweck, 1986; Elliot, 1999; Nicholls, 1984; Weiner, 1990, 1994, 2000). Hence, it seems reasonable to argue that students' adoption of mastery goals should deserve recognition and investigation as an important achievement-related outcome to be promoted in the classroom learning environment.

## *Self-Efficacy*

One factor gaining increased credence as a determinant of student's goal orientation is academic self-efficacy (Schunk, 1991; Skaalvik, 1997). It refers to student's judgments of how well he or she can do class-related works (Bandura, 1986). It influences the choice of assessment tasks students make, the effort they invest, and how long they will persist in difficult tasks (Bandura, 1993). Students tend to avoid assessment tasks they believe exceed their capabilities, whereas they approach others they believe that they are capable of handling their demands (Bandura, 1993). From the perspective of Bandura's (1986) social-cognitive theory and Elliot's (1999) review of achievement goal theory, self-efficacy is assumed to be a precursor to the adoption of approach achievement goal (e.g., mastery goals). Theoretically and empirically, it has been documented that academic self-efficacy and achievement goals tend to co-vary based on environmental demands (Alkharusi, 2008; Bandura, 1977, 1982; Deevers, 2005; Maehr, 1983, 1984). In light of these perspectives, it was hypothesized in this study that self-efficacy would have a direct effect on mastery goals.

## *Classroom Assessment Environment*

In the classroom, students are daily exposed to a variety of assessment activities. Educators have long recognized that the activities presented in the classroom communicate important messages to students about what is emphasized there, which in turn may lead to different patterns of achievement-related outcomes (Linnenbrink and Pintrich, 2001, 2002; Brookhart et al., 2006). Ames (1992a) noted that the following classroom assessment practices are likely to elicit positive patterns of motivation in students: (a) designing classroom assessment tasks that include challenge, variety, novelty, and active involvement; (b) giving students opportunities to make choices and decisions in the assessment process; (c) conducting assessment practices that are private, assess progress, improvement, and mastery, and avoid social comparisons; and (d) allowing for time on the assessment task to vary with the nature of the task and student needs. These practices are typically initiated by the classroom teacher. The overall sense or meaning that students make out of the various classroom assessment events constitutes the classroom assessment environment (Brookhart and DeVoge, 1999). Brookhart and her colleagues pointed out that each classroom has its own "assessment 'character' or environment" perceived by the students and springs from the teacher's classroom assessment practices (Brookhart, 2004, p. 444; Brookhart and Bronowicz, 2003).

The concept of classroom assessment environment was first introduced by Stiggins and Conklin (1992) as a result of their observations of the assessment practices of four teachers in three sixth grade classrooms. According to Stiggins and Conklin (1992), the classroom assessment environment included eight key elements. These were assessment purposes, assessment methods, criteria for selecting the assessment methods, quality of assessment, feedback on assessment results, teacher's assessment background and preparation, teacher's perception of students, and assessment policy (Stiggins and Conklin, 1992). Given that of interest in the classroom environment research are "students' perceptions of the meaning" of the classroom assessment practices (Ames, 1992b, p. 264), Stiggins and Conklin's (1992) conceptualization of the classroom assessment environment centered more on teachers' practices than on students' perceptions of these practices (Brookhart and Durkin, 2003). As such, based on a synthesis of classroom assessment and motivation literature, Brookhart (1997) developed a theoretical framework for the role of classroom assessment in student motivation and achievement. In this framework, classroom assessment environment was construed as a classroom context experienced by students as the teacher establishes assessment purposes, assigns

assessment tasks, sets performance criteria and standards, gives feedback, and monitors outcomes (Brookhart, 1997). The model tested in the current study was partly based on the framework of the classroom assessment environment proposed by Brookhart (1997).

Building on Brookhart's (1997) theoretical model and other motivational literature, McMillan and Workman (1998) have illustrated how particular classroom assessment practices increase or decrease student motivation. Specifically, McMillan and Workman (1998) explained that the following assessment practices may enhance student motivation to learn (pp. 22 - 23): (a) being clear about how learning will be evaluated, (b) providing specific feedback following an assessment activity, (c) using mistakes to show students how learning can be improved, (d) using moderately difficult assessments, (e) using many assessments rather than a few major ones, (f) using authentic assessment tasks, (g) using pre-established scoring criteria for evaluating student work, (h) providing incremental assessment feedback, and (i) providing attainable grading criteria prior to administering the assessment task. Along similar lines, Stiggins and Chappuis (2005) described four conditions that together may foster positive motivational patterns for students. These conditions stated that classroom assessments should focus on clear purposes, provide accurate reflections of achievement, provide frequent descriptive feedback on work improvement rather than judgmental feedback, and involve students in the assessment process (Stiggins and Chappuis, 2005). This conceptualization of the assessment environment raises important research questions. For example, what do students think about the assessment tasks, assessment feedback, and assessment standards and criteria as aspects of the classroom assessment environment established by the teacher in the class? Do students think that these aspects of the classroom assessment environment as motivating them to learn and master the content materials of the subject or discouraging learning and mastery pursuits? The present study attempts to shed light on these issues. On the basis of the classroom assessment perspectives cited above, classroom assessment environment was hypothesized to influence mastery goals both directly and indirectly through self-efficacy. Figure 1 presents the theoretical model summarizing the hypothesized relationships between the constructs reviewed previously concerning classroom assessment environment, self-efficacy, and mastery goals. The purpose of the present study is to determine how well this model fits the data from a sample of undergraduate students enrolled in an educational psychology course.

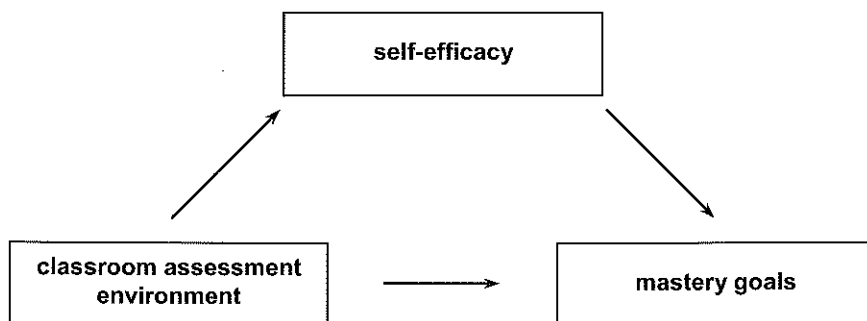


Figure 1. A theoretical model of classroom assessment environment, self-efficacy, and mastery goals

## METHODS

### *Participants and Procedures*

Participants were 242 undergraduate students enrolled in an educational psychology course in the College of Education at Sultan Qaboos University during the Fall 2008 semester. The sample was composed of 125 females and 117 males. The participants were either sophomores (71.1%) or juniors (28.9%) at the university, with a mean age of 20 years for the sample. The participants represented a diversity of education majors, including English language (27.7%), physical education (13.6%), science and math (13.2%), social studies (13.2%), Arabic language (9.1%), educational technology (9.1%), Islamic education (7%), and preschool education (7%).

The course instructor was contacted for permission to collect data from the students. The students were informed that a study of classroom assessment and motivation is being conducted. They were told that they were not obligated to participate in the study, and if they wished to participate, their responses would remain anonymous and confidential. The students were also told that participation in the study would not influence their grades or relations with the instructor in any way. Students who wished to participate were given a self-report questionnaire containing four sections about demographic information, mastery goals, self-efficacy, and classroom assessment environment. The questionnaire was administered by the instructor during a scheduled class meeting. The administration took about 15-20 minutes, and was preceded by a brief set of instructions about how to complete the questionnaire. It should be noted that the data for this study were collected in the context of a previous research; Alkharusi and Aldhafri (2008); however, none of the focal results reported in the present research has been reported in any prior work or being submitted for publication elsewhere.

### *Instrument*

The instrument used was a four-page questionnaire with four sections. The questionnaire items were phrased in relation to the educational psychology class. They were subjected to a content validation process done by a panel of three professors in the area of educational measurement and psychology at Sultan Qaboos University. They were asked to judge the clarity of wording and appropriateness of each item for the use with the targeted participants and its relevance to the construct being measured. Their feedback was used for refinement of the items. Following is a description of the four sections.

#### *Demographic Information*

The demographic information of the questionnaire covered gender, age, grade level (i.e., freshman, sophomore...etc), and major.

#### *Mastery Goals*

This section of the questionnaire included the three items ( $\alpha = .84$ ) measuring students' adoption of mastery-approach goals from Elliot and Murayama's (2007) Achievement Goal Questionnaire-Revised (AGQ-R). Responses were obtained on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A principal-components factor analysis was conducted on the three mastery goal items to determine whether they represented a single construct. This analysis yielded a single factor with an eigenvalue of 1.51, and the unifactor solution accounted for 50.43% of the total variance. All items loaded higher than .60 on the factor. Table 1 presents the factor loadings for the mastery goal items. A mastery goal measure was

constructed by averaging the three items. Internal consistency coefficient was .68 as measured by Cronbach's alpha.

**Table 1. Mastery goal items and their factor loadings**

Items	Factor loadings
1. My aim is to completely master the material presented in this class.	.77
2. I am striving to understand the content of this course as thoroughly as possible.	.75
3. My goal is to learn as much as possible from this course.	.61

### *Self-efficacy*

Informed by the literature (Greene et al., 2004; Midgley et al., 2000), six positively worded items were used to measure students' perceptions of their competence to do the work in their educational psychology class. Responses were obtained on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A principal-components factor analysis was conducted on the six self-efficacy items to determine whether they represented a single construct. This analysis yielded a single factor with an eigenvalue of 3.22, and the unifactor solution accounted for 53.73% of the total variance. All items loaded higher than .60 on the factor. Table 2 presents the factor loadings for the self-efficacy items. A self-efficacy measure was constructed by averaging the six items. Internal consistency coefficient was .82 as measured by Cronbach's alpha.

**Table 2. Self-efficacy items and their factor loadings**

Items	Factor loadings
1. I'm certain I can master the skills taught in the educational psychology course this semester.	.80
2. I'm certain I can figure out how to do the most difficult class work in educational psychology.	.75
3. Even if the work is hard, I can learn it.	.75
4. I am sure about my ability to do the assignments in this class.	.75
5. I am sure I have the ability to understand the ideas and skills taught in this class.	.69
6. I am certain I can understand the material presented in this class.	.65

### *Classroom Assessment Environment*

This section of the questionnaire was based on several existing questionnaires in the classroom assessment literature (e.g., Alkharusi, 2008; Church et al., 2001; Wang, 2004). Initially, it included 22 items, structured as statements, in the form of a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores reflecting greater agreement with the statement. Responses to the items were submitted to a principal-components factor analysis with varimax rotation. During this analysis, four items were deleted. The analyses yielded two factors as suggested by the eigenvalue rule and scree plot. Table 3 displays the factor loadings for the two-factor model of perceived classroom assessment environment. Together the two factors accounted for 35.64% of the total variance. All items loaded  $\geq .35$  on their primary factor. The first factor accounted for 21.08% of the variance (eigenvalue = 3.80) and consisted of nine items. According to the content of its items shown in Table 3 and in light of achievement goal theory and classroom assessment literature (Ames, 1992a, 1992b; Brookhart, 1997; McMillan and Workman, 1998; Wang, 2004), this factor was labeled a perceived "learning-

oriented" classroom assessment environment because its items focused on classroom assessment practices that improve student learning and mastery of content materials. The second factor accounted for 14.56% of the variance (eigenvalue = 2.62) and consisted of nine items. According to the content of its items presented in Table 3 and in light of achievement goal theory and classroom assessment literature (Ames, 1992a, 1992b; Brookhart, 1997; Church et al., 2001; McMillan and Workman, 1998; Wang, 2004), this factor was named a *perceived "performance-oriented" classroom assessment environment* because its items focused on harshness of assessment and grading as well as public evaluation and recognition practices. Measures of perceived learning-oriented and performance-oriented classroom assessment environment were constructed by averaging the items on each factor. Internal consistency coefficients for perceived learning-oriented and performance-oriented classroom assessment environment measures were .80 and .65 as indicated by Cronbach's alpha, respectively.

**Table 3. Perceived classroom assessment environment items and their factor loadings**

Items	Factor loadings	
	1	2
1. In this class, students can find out their strengths in the educational psychology course.	.74	
2. In this class, the instructor helps us identify the places where we need more effort in future.	.71	
3. In this class, the assignments and tests encourage thinking.	.70	
4. In this class, students receive continuous feedback from the instructor about their performance in the course.	.63	
5. In this class, students are given a chance to correct their mistakes.	.61	
6. In this class, the assignments and activities are related to students' every day lives.	.57	
7. In this class, the instructor holds us the responsibility to learn.	.54	
8. In this class, the instructor uses a variety of ways (e.g., tests, in-class tasks, homework assignments...etc) to assess our mastery of the learned course materials.	.47	
9. In this class, the assignments and tests are returned in a way that keeps individual student scores private.	.37	
10. The tests in this class are difficult to students		.72
11. It is difficult to achieve high grades in this class.		.70
12. In this class, the instructor gives more importance to the grades than to the learning.		.56
13. In this class, there is a mismatch between the learned course materials and the assigned homework and tests.		.51
14. In this class, the in-class and homework assignments are not interesting.		.44
15. In this class, the instructor's grading system is not clear.		.38
16. In this class, the assessment results do not fairly reflect the effort put in studying the course.		.37
17. In this class, the instructor compares students' performances to each other.		.36
18. In this class, students who do poorly are criticized in front of the whole class.		.35

*Note.* Factor 1 = perceived learning-oriented classroom assessment environment. Factor 2 = perceived performance-oriented classroom assessment environment.

## Data Analysis

Based on the results of the principal-components factor analysis of the classroom assessment environment, the theoretical model depicted in Figure 1 was extended to include the two facets of the perceived classroom assessment environment. In this model, the following hypothesized paths were tested to determine if (a) perceived learning-oriented classroom assessment environment has a direct effect on mastery goals, (b) perceived performance-oriented classroom assessment environment has a direct effect on mastery goals, (c) self-efficacy has a direct effect on mastery goals, (d) self-efficacy mediates the effects of perceived learning-oriented and performance-oriented classroom assessment environments on mastery goals, and (e) perceived learning-oriented and performance-oriented classroom assessment environments are related to each other. Figure 2 depicts these paths in the proposed model. As can be seen from Figure 2, the model consists of two exogenous variables and two endogenous variables. The exogenous variables were perceived learning-oriented and perceived performance-oriented classroom assessment environments. The endogenous variables were self-efficacy and mastery goals.

The model was estimated using the covariance structure in LISREL 8.52 (Jörkeskg and Sörbom, 2002). It was evaluated by (a) goodness-of-fit statistics which assessed how well the model fits the data, (b) chi-square divided by its degrees of freedom, (c) root mean square residual, and (d) *t* tests of specific path coefficients to determine whether each of the hypothesized relationships had been confirmed. Prior to the path analysis, the variables were screened for outliers and normality. There was no concern about deviation from normality. In addition, the means, standard deviations, and zero-order intercorrelations were computed for the variables.

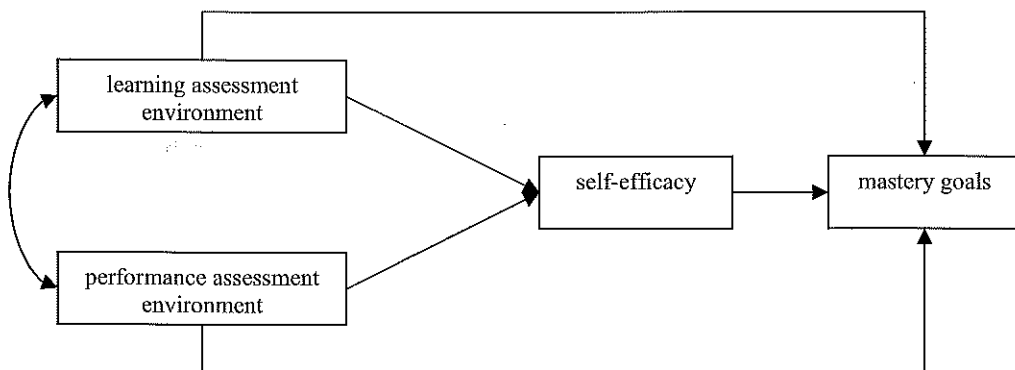


Figure 2. A proposed path model of classroom assessment environment, self-efficacy, and mastery goals

## RESULTS

Table 4 presents the means, standard deviations, and Pearson product-moment correlations of the study variables for all participants. As seen in Table 4, on average, the participants reported relatively high self-efficacy levels and tended to strongly adopt mastery goals. In addition, using paired samples *t*-test, the participants significantly perceive their classroom assessment environment to be more oriented toward learning than toward performance;  $t(241) = 17.06, p < .001$ . An examination of the zero-order correlations, shown in Table 4, provides validity evidence for the measures used in the study. Consistent with previous research and theory (Bandura, 1986; Deevers, 2005; Elliot, 1999; Midgley et al., 1998), self-efficacy was positively related to mastery goals. Perceived learning-oriented and

performance-oriented assessment environments were inversely related to each other, and each was significantly associated with self-efficacy and mastery goals (learning-oriented positively and performance-oriented negatively).

Table 4. Means, standard deviations, and intercorrelations for the study variables (N = 242)

Variables	MAG	SEF	LAE	M	SD
MAG	—			4.28	.53
SEF	.31***	—		3.95	.61
LAE	.24***	.36***	—	3.68	.62
PAE	-.15*	-.31***	-.41***	2.58	.58

Note. MAG = mastery goals. SEF = self-efficacy. LAE = learning-oriented classroom assessment environment. PAE = performance-oriented classroom assessment environment.

\* $p < .05$ . \*\*\* $p < .001$ .

Figure 3 displays results of the path analysis model of perceived classroom assessment environment, self-efficacy, and mastery goals. Based on the fit indicators, the estimated model perfectly fit the observed data. The probability associated with the  $\chi^2$  value was 1. With respect to the path coefficients, the hypotheses were generally supported. As shown in Figure 3, there was a statistically significant positive direct effect of perceived learning-oriented assessment environment on both self-efficacy ( $\gamma = .28$ ,  $t = 4.32$ ) and mastery goals ( $\gamma = .15$ ,  $t = 2.17$ ), indicating that classroom assessment environments with a strong emphasis on learning and understanding tends to foster high levels of self-efficacy and mastery goals. At the same time, the perceived learning-oriented classroom assessment environment has an indirect effect on mastery goals through self-efficacy. However, this indirect effect is weaker than its corresponding direct effect ( $.28 \times .25 = .07$ ). In addition, as predicted, self-efficacy has a statistically significant positive direct effect on mastery goals ( $\gamma = .25$ ,  $t = 3.75$ ), suggesting that students with a high sense of self-efficacy tends to adopt mastery goals.

In contrast to perceived learning assessment environment, perceived performance-oriented assessment environment has a statistically significant negative direct effect on self-efficacy ( $\gamma = -.20$ ,  $t = 3.07$ ), indicating that classroom assessment environments characterized by harsh grading and public evaluation practices are likely to discourage high sense of efficacy. Although the perceived performance-oriented assessment environment has no statistically significant direct effect on mastery goals ( $\gamma = -.01$ ,  $t = 0.11$ ), it affects mastery goals indirectly through self-efficacy ( $-.20 \times .25 = -.05$ ), which is almost the same in magnitude as the indirect effect of the perceived learning-oriented assessment environment. As also shown in Figure 3, the perceived learning-oriented and performance-oriented assessment environments are negatively related to each other ( $\phi = -.41$ ,  $t = 5.86$ ), suggesting that they represent two distinct, yet, related aspects of the classroom assessment environment. Overall, the model accounts for 11.4% of the variance in mastery goals and 16.4% of the variance in self-efficacy. It should be noted that a number of alternative models were tested in order to fully confirm that the model presented in Figure 3 best fits the observed data. However, these models were dismissed due to poor goodness of fit indices.



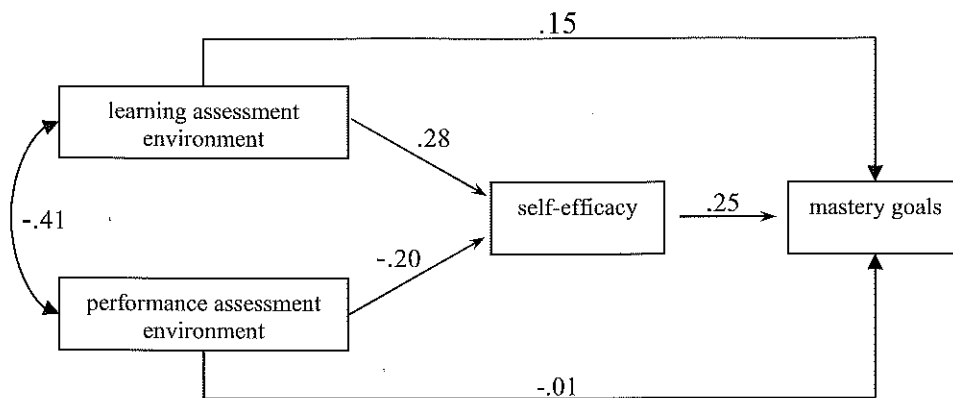


Figure 3. The estimated path model of classroom assessment environment, self-efficacy, and mastery goals

## DISCUSSION

The present study provided an empirical test of a causal model concerning relationships among classroom assessment environment, self-efficacy, and mastery goals. The results suggest that, as predicted, perceived learning-oriented classroom assessment environment has a positive effect on both student's self-efficacy and mastery goals, whereas perceived performance-oriented classroom assessment environment has an indirect effect on student's mastery goals through self-efficacy. Furthermore as predicted, self-efficacy positively affects mastery goals and mediates the effects of perceived learning-oriented and performance-oriented classroom assessment environments on mastery goals. Finally, the perceived learning-oriented and perceived performance-oriented classroom assessment environments correlated negatively with each other. These results lend support to the theoretical perspectives about the role of classroom assessment in student academic motivation and achievement (Ames, 1992a; Brookhart, 1997; McMillan and Workman, 1998; Stiggins and Chappuis, 2005). Also, the results provide additional evidence to the conclusion that classroom assessment environment have both direct and indirect effects, which may be positive or negative, on student motivational beliefs, and hence deserve further attention and investigation (Crooks, 1988).

Two decades ago, Elton and Laurillard (1979, p. 100) stated that "the quickest way to change student learning is to change the assessment system", suggesting that classroom assessment practices might be potent in their effects. The current study offers two implications for how instructors can create classroom environments conducive for learning. First, the study demonstrated that classroom environments focusing on assessment practices that ask students to do a variety of challenging and meaningful assessment tasks, with opportunities to improve the performance, followed by informative assessment feedback are likely to encourage students to hold higher levels of self-efficacy and endorse mastery goals. Second, on the contrary, as revealed in this study, classroom environments focusing on assessment practices that provide students difficult and less meaningful assessment tasks with unattainable assessment standards and criteria, emphasize the importance of grades rather than learning, and focus on public rather than private evaluation and recognition practices are likely to discourage students from the pursuit of mastery goals by lowering their sense of efficacy.

As revealed in the current study and across a large number of studies (e.g., Alkharusi, 2008; Deevers, 2005; Linnenbrink, 2005) self-efficacy was positively related to mastery goals. This relationship suggests that students connect their aim to engage in an assessment task (i.e., their achievement goal) with the level of their perceived ability likely to lead to the adoption of that goal. From the perspective of the social-cognitive theory and classroom assessment, the characteristics of the assessment task in terms of its difficulty, importance, utility, and value affect students' self-efficacy, which in turn affect students' achievement goals (McMillan and Workman, 1998). For example, when the assessment task is perceived to be difficult and less meaningful with unknown scoring criteria, then there is little basis to maintain a strong sense of efficacy, which in turn might undermine the pursuit of mastery goals (McMillan and Workman, 1998). This connection between assessment and motivational beliefs suggests that instructors need to attend to the various aspects of the classroom assessment environment in order to help students display adaptive motivational beliefs.

Although the present study provides a replication of the findings of the previous studies reporting relationships among classroom environment, self-efficacy, and mastery goals (e.g., Alkharusi, 2008; Brookhart and Durkin, 2003; Greene et al., 2004; Linnenbrink, 2005), it adds to them the empirical test of the causal ordering of these relationships. However, the results still are correlational in nature, and as such the next step in the process should be some form of experimental research to testify the causal nature of these relationships. Moreover, although research on classroom assessment and academic motivation (e.g., Ames, 1992a; Brookhart, 1997; McMillan and Workman, 1998) guided the selection of variables in this study, the findings are limited by testing only a small number of variables. Our understanding of the role of the classroom assessment on student achievement and motivation could be enhanced by considering other background and demographic variables as well as other academic achievement motivation outcomes.

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