*International Journal of Instruction* *January 2013 ● Vol.6, No.1*
*e-ISSN: 1308-1470 ● www.e-iji.net* *p-ISSN: 1694-609X*

# Canonical Correlational Models of Students' Perceptions of Assessment Tasks, Motivational Orientations, and Learning Strategies

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The present study aims at deriving correlational models of students' perceptions of assessment tasks, motivational orientations, and learning strategies using canonical analyses. Data were collected from 198 Omani tenth grade students. Results showed that high degrees of authenticity and transparency in assessment were associated with positive students' self-efficacy and task value. Also, high degrees of authenticity, transparency, and diversity in assessment were associated with a strong reliance on deep learning strategies; whereas a high degree of congruence with planned learning and a low degree of authenticity were associated with more reliance on surface learning strategies. Implications for classroom assessment practice and research were discussed.

Key Words: Classroom Assessment, Motivation, Learning Strategies, Assessment Tasks, Canonical Analysis

## INTRODUCTION

A substantial proportion of the classroom time involves exposing students to a variety of assessment tasks (Crooks, 1988; Mertler, 2003). As students process these tasks, they develop beliefs about the importance, utility, value, and difficulty of the tasks as well as their personal chance of success (McMillan & Workman, 1998). The characteristics of the assessment tasks as perceived by students are central to the understanding of student motivational orientations and learning strategies (Alkharusi, 2008, 2010, 2011; Black & Wiliam, 1998; Schaffner, Burry-Stock, Cho, Boney, & Hamilton 2000; Segers & Dochy, 2006; Struyven, Dochy, & Janssens, 2002).

Research has shown that assessment tasks can be evaluated from students' perspectives along a variety of dimensions that might make a difference in terms of student motivation and learning. For example, based on a sample of 658 science students in English secondary schools, Dorman and Knightley (2006) developed a 40-item inventory measuring students' perceptions of the assessment tasks along five dimensions: congruence with planned learning, authenticity, student consultation, transparency, and diversity. Congruence with planned learning refers to the extent to which students perceive the assessment tasks align with the subject's learning objectives

and activities. Authenticity refers to the extent to which students perceive the assessment tasks are related to their everyday living. Student consultation refers to the extent to which students are involved and consulted in the assessment process. Transparency refers to the extent to which students are clearly informed about the purposes and forms of the assessment. Diversity refers to the extent to which students perceive that they can complete the assessment tasks at their own speed (Dorman & Knightley, 2006).

The present study aims at developing canonical correlational models to demonstrate the ways in which these dimensions of the assessment tasks might relate to a particular set of student motivational orientations and learning strategies. The conceptual foundation for these models is a synthesis of research integrating classroom assessment environment as perceived by students, their motivational orientations, and learning strategies. Following is a review of this research.

**Classroom Assessment Environment**

Educators have long recognized that the assessment tasks used in the classroom communicate important messages to students about the value, importance, and usefulness of the tasks. These messages may influence students' motivational orientations and learning strategies in how they would approach and accomplish the tasks (Ames, 1992b; Ames & Archer, 1988; Linnenbrink & Pintrich, 2001, 2002). For example, Ames (1992a) noted that certain classroom assessment practices are likely to enhance student motivation to learn by developing a sense of efficacy, perceiving the task as being important and meaningful, mitigating test anxiety, and emphasizing deep meaning and understanding as opposed to surface meaning and rote memorization. According to Ames (1992a), these practices are: (a) designing assessment tasks that include challenge, variety, novelty, and active involvement; (b) giving students opportunities to make choices and decisions regarding their learning; (c) providing private recognition and rewards that focus on individual student effort and improvement; (d) creating small groups of heterogeneous abilities that encourage working effectively with others on learning tasks and developing a feeling of belongingness; (e) conducting evaluation practices that are private, assess progress, improvement, and mastery, and avoid social comparisons; and (f) allowing for time on the assessment task to vary with the nature of the task and student needs.

The assessment practices are typically initiated by the classroom teacher. The overall sense or meaning that students make out of the various assessment tasks constitutes the classroom assessment environment (Brookhart & 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 assessment practices (Brookhart, 2004, p. 444; Brookhart & Bronowicz, 2003). Based on a synthesis of classroom assessment literature and motivation theory, Brookhart (1997) developed a theoretical framework for the role of the classroom assessment in motivating students to learn. In this framework, classroom assessment environment is 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. Based on this framework, it has been postulated that students' perceptions of the classroom assessment environment may influence their motivational beliefs and achievement (Brookhart, 1997).

Building on Brookhart's (1997) theoretical model and other motivational literature, McMillan and Workman (1998) illustrated how particular assessment practices increase or decrease student motivational orientations and learning strategies. Specifically, McMillan and Workman (1998) explained that the following assessment practices may enhance students' learning approaches and motivation: (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 tests, (f) using authentic assessment tasks, (g) using preestablished criteria for evaluating student work, (h) providing incremental assessment feedback, and (i) providing scoring criteria prior to administering the assessment task.

Along similar lines, Stiggins (1999) as well as Stiggins and Chappuis (2005) contend that day-to-day classroom assessment can be used in more productive ways to motivate students to learn and increase their learning confidence. Stiggins and Chappuis (2005) described four conditions that together may foster positive motivational patterns for students. These conditions state 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. In addition, when students are involved in the assessment process through self-assessment, they are more likely to assume responsibility for their own learning (Conderman, Hatcher, & Ikan, 1998). In an empirical study of 264 students enrolled in the first year Introductory Commercial Law course, Dancer and Kamvounias (2005) found that increased class participation and an improved class performance resulted from involving students in the development of assessment criteria for class assignments. This suggests that students' perceptions of assessment might be instrumental in improving student learning-related outcomes such as motivational orientations and learning strategies.

**Assessment Environment and Student Motivational Orientations**

Of increasing interest to the educational assessment community is the effect of classroom assessment on student motivation-related beliefs. In a study investigating part of Brookhart's (1997) theoretical model, Brookart and DeVoge (1999) used observation, survey, and interview techniques to collect data from four classroom assessment events in two third-grade language arts classes. Results revealed positive relationships among assessment tasks' characteristics as perceived by students, their perceptions of ability to do the task, effort, and achievement. During the interviews, students expressed the importance of the assessment tasks in accordance with their motivational orientations. Some students indicated the importance of the tasks in terms of their value for learning. Other students expressed task importance in terms of getting good grades. At the conclusion, Brookhart and DeVoge (1999) suggested that students'

perceptions should be considered when studying the impact of classroom assessment on student motivation.

Although the focus was on college level students, Church, Elliot, and Gable (2001) conducted two studies to examine the relationships among perceptions of classroom environment and motivational orientations for undergraduate students enrolled in chemistry classes. Results indicated that students' perceptions of the assessment environment as being interesting and meaningful were positively related to their adoption of mastery goals, whereas their perceptions of the assessment environment as being difficult and focusing on grades rather than learning were negatively related to their adoption of mastery goals and positively related to their adoption of performance goals. When perceived assessment environment and motivational goal variables were tested together as predictors of graded performance and intrinsic motivation, results showed that the perceived assessment environment influenced adoption of motivational goals, which in turn directly influenced graded performance and intrinsic motivation after controlling for student's gender, competence valuation, and SAT scores.

Likewise, in a study of 503 first year Chinese EFL students, Wang (2004) found that after controlling for student gender, students' perceptions of the assessment environment as being learning oriented contributed positively to their adoption of mastery goals, whereas students' perceptions of the assessment environment as being test oriented contributed negatively to their adoption of performance goals. The findings of both Church et al. (2001) and Wang (2004) suggest that educators need to understand that assessment environments featuring stringent evaluative standards may represent a risk factor in students' motivational orientations.

In a related study of classroom assessment and motivation of 96 high school students enrolled in social studies classes, Brookhart and Durkin (2003) examined relations among student perceptions of the assessment tasks, self-efficacy, and goal orientations. Using content analyses of student interviews and implications of students' responses on other instruments, results indicated that correlations between mastery goal orientations, self-efficacy, and perceived assessment task characteristics were positive and moderate in strength.

Greene, Miller, Crowson, Duke, and Akey (2004) used a path analysis technique to test predictions of a model explaining the impact of students' perceptions of the assessment environment on their motivational orientations in English classes for 220 high school students. They found that students who perceived the assessment tasks as being meaningful and motivating tended to endorse mastery motivational orientations. Similarly, Alkharusi (2009) used a path analysis to examine a model of the relationships among students' perceptions of the assessment environment, self-efficacy, and motivational orientations for 242 undergraduate students enrolled in psychology classes. Results indicated that students' perceptions of the assessment environment as being learning oriented were positively related to students' self-efficacy and mastery orientations whereas students' perceptions of the assessment environment as being hard and emphasizing grades contributed negatively to students' self-efficacy and mastery orientations. Both studies of Green et al. (2004) and Alkharusi (2009) point to a

conclusion that students' perceptions of assessment might have direct or indirect effects, which may be positive or negative, on students' motivational orientations, and as such they deserve further attention.

**Assessment Environment and Student Learning Strategies**

Research on learning suggests that students have preferred strategies for learning, usually known as either deep learning strategies like elaboration, organization, and critical thinking; or surface learning strategies like rehearsal (Biggs, 1979; Pintrich, Smith, Garcia, & Mckeachie, 1993). McMillan and Workman (1998) postulated that the type of assessment tasks; whether it is multiple-choice, essay, or performance-based; might affect students' learning strategies. In a study of 206 second year Education students from Sydney, Scouller (1998) investigated the influence of assessment methods on students' approaches to learning. Results indicated that students were more likely to employ surface learning strategies when preparing for multiple-choice examination and deep learning strategies when preparing for essay assignments. These results suggest that assessment tasks perceived as demanding higher level cognitive processes are likely to encourage students to focus on elaboration, meaning, and understanding rather than on rehearsal.

In their review of literature on perceptions of assessment, Struyven, Dochy, and Janssens (2002) indicated that there is a reciprocal relationship between students' perceptions of assessment and their learning strategies. This has been confirmed by Segers, Nijhuis, and Gijselaers' (2006) study of the relationship between students' intentions to employ a particular learning strategy, their perceptions of assessment demands, and their actual use of the learning strategy. Two groups of students enrolled in an International Business Strategy course were compared. The first group of 406 students attended the course using an assignment-based format, whereas the second group of 312 students attended the course using a problem-based format. Results indicated that in both assessment conditions, students who intended to employ surface learning strategies tended to perceive the assessment demands as surface and actually use surface learning strategies. In a study of 118 senior students of a vocational training program, Gulikers, Bastiaens, Kirschner, and Kester (2006) examined relationships between perceptions of assessment authenticity and alignment on students' approaches to learning. Results showed that when students perceive the assessment task as being more authentic and more aligned to the classroom instruction, they are more likely to employ deep learning strategies. However, there were no relationships between perceptions of assessment task authenticity and alignment and surface learning.

Gijbels, Segers, and Struyf (2008) examined relationships between change in students' perceptions of the assessment tasks and change in their learning strategies in an Educational Psychology course for participants in a teacher training program. Results showed that as students perceive the assessment tasks as more demanding; they tend to employ deep strategies of learning. Also, changes in students' perceptions of the assessment demands towards less surface levels tend to be associated with changes in their learning strategies to be more surface oriented. Recently, in a survey of perceptions of assessment and learning strategies among university level students,

Ullah, Richardson, and Hafeez (2011) found that students who held positive perceptions of the assessment tasks tended to adopt deep learning strategies whereas students who held negative perceptions of the assessment tasks tended to adopt surface learning strategies. These results imply that students may vary their learning strategies depending on their interpretations of the demands of the assessment tasks, and as such their perceptions of the assessment tasks might need to be considered.

Although much has been written about the role of classroom assessment in student motivation- and learning-related variables, research investigating assessment antecedents and predictors of those variables has languished. Despite the number of potentially assessment variables that may influence student motivational orientations and learning strategies, there is no clear evidence that a particular set of assessment variables consistently predict student motivational orientations and learning strategies. One reason that might account for the limited attention given to this issue is the lack of a comprehensive model describing the nature and underlying patterns of the relationships of students' perceptions of assessment tasks to their motivational orientations and learning strategies. Therefore, the current study is expected to fill this gap in the literature.

Overall, previous studies have showed that enhancing student motivational orientations and learning strategies is universally accepted as one of the goals of the classroom assessment. Building on these studies and on the theoretical works of Ames (1992a), Brookhart (1997), and McMillan and Workman (1998); the purpose of the present study was to further examine the ways in which certain dimensions of assessment tasks might relate in meaningful patterns to a particular set of motivational orientations and learning strategies. The dimensions of assessment consisted of the extent to which students perceive the assessment tasks as being congruence with planned learning and authentic, involve student consultation, and feature transparency and diversity (Dorman & Knightley, 2006). The motivational orientations include students' perceptions of self-efficacy which refer to their judgements about their ability to accomplish the tasks; their task value beliefs which refer to their judgments of how interesting, useful, and important the subject materials to them; and test anxiety which refers to their worry and concern when taking tests (Pintrich et al., 1993). The learning strategies include students' use of rehearsal, organization, and elaboration when studying for the subject. Using a canonical correlation analysis, the study aimed at establishing multivariate models that can account for a greater amount of variance in students' motivational orientations and learning strategies as a function of the perceived characteristics of the assessment tasks.

**Purpose of the Study and Research Questions**

This study aimed at building canonical correlational models describing the nature of the relationships between students' perceptions of the assessment tasks and (a) their motivational orientations and (b) learning strategies. The study was guided by the following research questions:

1. How do students' perceptions of the assessment tasks relate to their motivational orientations?
2. How do students' perceptions of the assessment tasks relate to their learning strategies?

**Context of the Study**

This study sought to canonically analyze the relationships among students' perceptions of the assessment tasks, motivational orientations, and learning strategies using data from a sample of tenth grade students in English language classes in Oman. The canonical analysis was utilized because it helps understand the multivariate relationships among assessment, motivation, and learning. The tenth grade was chosen because it is the exit grade for basic education schools in Oman, and as such it represents the culmination of the basic education school years in Oman. The students in this grade level are expected to be much more able to evaluate the featured characteristics of the assessment tasks. The subject of English was chosen because it is a required subject for basic education students with a variety of components such as listening, speaking, grammar, reading, and writing; and as such it seems an intriguing context for studying variability in students' perceptions of assessment tasks, motivational orientations, and learning strategies.

**METHOD**

**Participants and Procedures**

The participants in this study were 198 Omani tenth grade students (103 females and 95 males) enrolled in English language classes at Muscat public schools in Oman. Their ages ranged from 15 to 17 years with an average of 16.13 and a standard deviation of .52. After obtaining schools' permission, the data collection process took place, three weeks prior to the final exam week, during a regular scheduled class meeting. The students were informed that a study of classroom assessment and student motivation and learning strategies is being conducted. They were informed that they were not obligated to participate in the study, and if they wished to participate, their responses would remain anonymous and confidential. They were also told that participation in the study would not influence their grades or relations with the teacher in any way.

Students who wished to participate were asked to respond to a self-report questionnaire, which will be described in a later section of this study. It contained four main sections about demographic information in terms of gender and age; motivational orientations in terms of self-efficacy, task value, and test anxiety; learning strategies in terms of elaboration, organization, and rehearsal; and perceptions of assessment tasks in terms of congruence with planned learning, authenticity, student consultation, transparency, and diversity. The questionnaire was administered by the author during a scheduled class meeting. The administration took about one hour, and was preceded by a brief set of instructions about how to complete the questionnaire.

**Instrument**

The instrument used was a self-report questionnaire with four main sections. The questionnaire items were phrased in relation to the assessment tasks used, motivational orientations adopted, and learning strategies employed in the English language 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. Internal consistency reliability was established using Cronbach's alpha. Following is a description of the four sections.

*Demographic Information*

The demographic information of the questionnaire covered gender and age.

*Motivational Orientations*

This section of the questionnaire included 19 items measuring students' self-efficacy (8 items, $\alpha$ = .93; e.g., "I am confident that I can learn the basic concepts taught in the English language class"), perceptions of task value (6 items; $\alpha$ = .90; e.g., "I am very interested in the content area of my English language class"), and test anxiety (5 items; $\alpha$ = .80; e.g., "I feel my heart beating fast when I take an exam in the English language class") from Pintrich et al.'s (1993) Motivated Strategies for Learning Questionnaire (MSLQ). Responses were obtained on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

A principal-components factor analysis with varimax rotation was conducted on the 19 items of the motivational orientations to determine whether they represented the constructs being measured. The analyses yielded three factors as suggested by the eigenvalue rule and scree plot. Together the three factors accounted for 43.67% of the total variance. The first factor accounted for 20.91% of the variance (eigenvalue = 2.28) and consisted of the eight self-efficacy items, with loadings ranging from .35 to .65. The second factor accounted for about 14% of the variance (eigenvalue = 2.07) and consisted of the five test anxiety items, with loadings ranging from .34 to .64. The third factor accounted for 8.76% of the variance (eigenvalue = 1.56) and consisted of the six task value items, with loadings ranging from .30 to .64. Internal consistency coefficients for the measures of self-efficacy, task value, and test anxiety were .75, .70, and .64 as indicated by Cronbach's alpha, respectively. The score reliabilities of the current sample seem comparable to those reported by Pintrich et al. (1993). Each measure was constructed by averaging its corresponding items.

*Learning Strategies*

This section of the questionnaire included 14 items measuring students' use of learning strategies such as elaboration (6 items; $\alpha$ = .75; e.g., "When I study for the class, I pull together information from different sources such as student book, readings, and class notes"), organization (4 items; $\alpha$ = .64; e.g., "I make simple charts or tables to help me organize my English language class materials"), and rehearsal (4 items; $\alpha$ = .69; e.g. "I make lists of important items for my English language class and memorize the lists") from Pintrich et al.'s (1993) Motivated Strategies for Learning Questionnaire (MSLQ). Responses were obtained on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

A principal-components factor analysis with varimax rotation was conducted on the 14 items of the learning strategies to determine whether they represented the constructs being measured. The analyses yielded three factors as suggested by the eigenvalue rule and scree plot. Together the three factors accounted for 39.65% of the total variance. The first factor accounted for 15.85% of the variance (eigenvalue = 1.87) and consisted of the six elaboration items, with loadings ranging from .50 to .61. The second factor accounted for 13.21% of the variance (eigenvalue = 1.31) and consisted of the four organization items, with loadings ranging from .53 to .60. The third factor accounted for 10.60% of the variance (eigenvalue = 1.27) and consisted of the four rehearsal items, with loadings ranging from .55 to .58. Internal consistency coefficients for the measures of elaboration, organization, and rehearsal were .73, .74, and .69 as indicated by Cronbach's alpha, respectively. The score reliabilities of the current sample seem comparable to those reported by Pintrich et al. (1993). Each measure was constructed by averaging its corresponding items.

*Perceptions of Assessment*

This section of the questionnaire included 35 items measuring students' perceptions of assessment tasks in terms of congruence with planned learning (7 items; $\alpha$ = .73; e.g., "I am assessed on what the teacher has taught me"), authenticity (7 items; $\alpha$ = .75; e.g., "My assessment tasks in the English language class are meaningful"), student consultation (7 items; $\alpha$ = .74; e.g., "I am asked about the types of assessment I would like to have in the English language class"), transparency (7 items; $\alpha$ = .85; e.g., "I am told in advance when I am being assessed"), and diversity (7 items; $\alpha$ = .63; e.g., "I am given a choice of assessment tasks") from Dorman and Knightley's (2006) Perceptions of Assessment Tasks Inventory (PATI). Responses were obtained on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

A principal-components factor analysis with varimax rotation was conducted on the 35 items of the perceptions of assessment tasks to determine whether they represented the constructs being measured. The analyses yielded five factors as suggested by the eigenvalue rule and scree plot. Together the five factors accounted for 43.78% of the total variance. The first factor accounted for 10.27% of the variance (eigenvalue = 2.32) and consisted of the seven transparency items, with loadings ranging from .49 to .68. The second factor accounted for 9.80% of the variance (eigenvalue = 2.11) and consisted of the seven authenticity items, with loadings ranging from .37 to .67. The third factor accounted for 9.26% of the variance (eigenvalue = 2.09) and consisted of the seven diversity items, with loadings ranging from .44 to .62. The fourth factor accounted for 7.42% of the variance (eigenvalue = 1.97) and consisted of the seven congruence with planned learning items, with loadings ranging from .30 to .69. The fifth factor accounted for 7.04% of the variance (eigenvalue = 1.69) and consisted of the seven student consultation items, with loadings ranging from .36 to .62. Internal consistency coefficients for the measures of congruence with planned learning, authenticity, student consultation, transparency, and diversity were .71, .72, .65, .66, and .63 as indicated by Cronbach's alpha, respectively. The score reliabilities of the

current sample seem comparable to those reported by Dorman and Knightley (2006). Each measure was constructed by averaging its corresponding items.

**Data Analysis**

Two canonical correlation analyses were used. The first was between students' perceptions of the assessment tasks and their motivational orientations. The second was between students' perceptions of the assessment tasks and their learning strategies. The underlying logic of the canonical correlation analysis used in this study was stated by Hair, Anderson, Tatham, and Grablowsky (1979, p. 182) as involving "the derivation of a linear combination of variables from each of the two sets of variables so that the correlation between the two linear combinations is maximized". Prior to the canonical correlation analyses, descriptive statistics and bivariate correlations among the variables were examined. In addition, multivariate analyses of variance were conducted in order to examine whether gender would account for variability in the students' perceptions of the assessment tasks, motivational orientations, and learning strategies.

**RESULTS**

**Preliminary Multivariate Analyses**

Findings from past research (e.g., Author, 2008; de Lange & Mavondo, 2004; Wehrwein, Lujan, & DiCarlo, 2006) showed potential gender differences on motivational orientations, learning strategies, and perceptions of assessment tasks. Therefore, in this study, three preliminary multivariate analyses were conducted to assess the degree to which gender would account for variability in the three motivational orientations of self-efficacy, task value, and test anxiety; three learning strategies of elaboration, organization, and rehearsal; and five perceptions of assessment tasks in terms of congruence with planned learning, authenticity, student consultation, transparency, and diversity. Table 1 presents the means and standard deviations for males and females on the motivational orientations, learning strategies, and perceptions of assessment tasks. The results indicated nonstatistically significant multivariate effects of gender on the motivational orientations, $F$ (3, 194) = 1.60, $p$ > .05, Wilks' Lambda = .98; learning strategies, $F$ (3, 194) = .55, $p$ > .05, Wilks' Lambda = .99; and perceptions of assessment tasks, $F$ (3, 194) = .77, $p$ > .05, Wilks' Lambda = .98. Hence, the remaining analyses of central interest in this study were conducted on the pooled data including both males and females.

Table 1: Means and standard deviations for males and females on the motivational orientations, learning strategies, and perceptions of assessment tasks

| Variable | Males ($n$ = 95) | | Females ($n$ = 103) | |
|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* |
| Motivational orientations | | | | |
| Self-efficacy | 3.75 | .72 | 3.72 | .78 |
| Task value | 4.17 | .62 | 3.98 | .78 |
| Test anxiety | 2.52 | .88 | 2.63 | .77 |
| Learning strategies | | | | |
| Elaboration | 3.56 | .66 | 3.56 | .72 |

| | | | | |
|---|---|---|---|---|
| Organization | 3.57 | .77 | 3.52 | .71 |
| Rehearsal | 3.51 | .68 | 3.51 | .69 |
| Perceptions of assessment tasks | | | | |
| Congruence with planned learning | 3.48 | .81 | 3.52 | .75 |
| Authenticity | 3.70 | .78 | 3.62 | .77 |
| Student consultation | 3.46 | .70 | 3.45 | .70 |
| Transparency | 3.61 | .76 | 3.55 | .68 |
| Diversity | 3.35 | .68 | 3.35 | .67 |

**Bivariate Correlational Analyses**

The purpose of this study centers on the interrelationships between (a) students' motivational orientations and perceptions of the assessment tasks and (b) students' learning strategies and perceptions of the assessment tasks. Descriptive statistics and bivariate correlations among these variables are presented in Table 2. Inspection of Table 2 shows that the correlations among the motivational orientations ranged from .09 to .49, the correlations among the learning strategies ranged from .52 to .65, and the correlations among the perceptions of assessment tasks ranged from .44 to .68. The perceptions of assessment tasks correlated from .24 to .50 with the motivational orientations and from .40 to .59 with the learning strategies. At the same time, test anxiety correlated negatively with learning strategies and perceptions of assessment tasks. These bivariate correlations between the motivational orientations and perceptions of assessment tasks as well as between the learning strategies and perceptions of assessment tasks suggested multiple patterns or differential relationships between each of the two sets of variables.

Table 2: Intercorrelations and descriptive statistics for study variables

| Variable | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | M | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Self-efficacy | .49* | -.09 | .46* | .46* | .35* | .37* | .44* | .34* | .42* | .31* | 3.73 | .75 |
| 2. Task value | | -.26* | .44* | .37* | .34* | .41* | .50* | .39* | .50* | .41* | 4.07 | .72 |
| 3. Test anxiety | | | -.28* | -.19* | -.20* | -.24* | -.27* | -.27* | -.28* | -.27* | 2.57 | .82 |
| 4. Elaboration | | | | .63* | .65* | .52* | .59* | .50* | .56* | .48* | 3.56 | .69 |
| 5. Organization | | | | | .52* | .59* | .59* | .49* | .57* | .50* | 3.54 | .74 |
| 6. Rehearsal | | | | | | .51* | .43* | .40* | .47* | .40* | 3.62 | .78 |
| 7. Learning congruence | | | | | | | .66* | .68* | .65* | .46* | 3.50 | .78 |
| 8. Authenticity | | | | | | | | .54* | .60* | .46* | 3.66 | .78 |
| 9. Student consultation | | | | | | | | | .62* | .44* | 3.46 | .70 |
| 10. Transparency | | | | | | | | | | .51* | 3.57 | .71 |
| 11. Diversity | | | | | | | | | | - | 3.35 | .67 |

*$p < .001$

**Canonical Correlation Analysis of Motivational Orientations and Assessment**

To study the underlying patterns of the relationships between the motivation variables and the assessment variables, a multivariate linear model was fitted to the data by means of canonical correlation analysis. The perceptions of assessment tasks were utilized as predictor variables of the student motivational orientations. Collectively, the full model across all variates was statistically significant, $F$ (15, 524.91) = 10.95, $p < .001$, Wilk's Lambda = .48; suggesting some relationship between the variable sets across the variates. The analysis yielded three canonical variates with squared canonical coefficients of .52, .02, and .002 for each successive variate. Based on the dimension reduction analysis, with the first pair of the canonical variates removed, the test was not statistically significant, $F$ (8, 382) = .56, $p > .05$. Therefore, only the first pair of

the canonical variates should be interpreted. Table 3 presents the standardized canonical coefficients between motivational orientations and perceptions of assessment tasks.

Table 3: Canonical correlation analysis summary of motivational orientations and perceptions of assessment tasks

| *Variable* | *Canonical coefficient* |
|---|---|
| Motivational orientations | |
| Self-efficacy | .48 |
| Task value | .54 |
| Test anxiety | -.28 |
| % of variance | 55.03 |
| Redundancy | .29 |
| Perceptions of assessment tasks | |
| Congruence with planned learning | -.10 |
| Authenticity | .55 |
| Student consultation | .07 |
| Transparency | .48 |
| Diversity | .09 |
| % of variance | .67 |
| Redundancy | .35 |
| canonical correlation ( $R_c$ ) | .72 |
| Squared canonical correlation ($R_c^2$) | .52 |

As shown in Table 3, 52% of the multivariate variance of the motivational orientations was accounted for by the perceptions of the assessment tasks. The canonical variate extracted 55.03% of the variance in the motivational orientations and 67% of the variance in the perceptions of assessment tasks. Further, the canonical variate from the motivational orientations extracted 35% of the variance in the perceptions of assessment tasks, whereas the canonical variate from the perceptions of assessment tasks extracted 29% of the variance in the motivational orientations. Among the motivational orientations, self-efficacy and task value were correlated with the canonical variate. Among the assessment variables, authenticity and transparency were correlated with the canonical variate. As shown in Table 3, high authenticity and high transparency in assessment tasks were associated with positive students' judgments of their self-efficacy for learning the course materials and positive students' beliefs about how interesting, useful, and important the course materials are to them.

**Canonical Correlation Analysis of Learning Strategies and Assessment**

To study the underlying patterns of the relationships between the learning strategies and the assessment variables, a multivariate linear model was also fitted to the data by means of canonical correlation analysis. The perceptions of assessment tasks were utilized as predictor variables of the student learning strategies. Collectively, the full model across all variates was statistically significant, $F$ (15, 524.91) = 18.91, $p < .001$, Wilk's Lambda = .30; suggesting some relationship between the variable sets across the variates. The analysis yielded three canonical variates with squared canonical coefficients of .66, .09, and .002 for each successive variate. Based on the dimension reduction analysis, with the first and second pairs of the canonical variates removed, the

test was not statistically significant, $F$ (3, 192) = .16, $p$ > .05. Therefore, the first two pairs of the canonical variates should be interpreted. Table 4 presents the standardized canonical coefficients between the learning strategies and the perceptions of assessment tasks. The first canonical variate accounted for 67% of the common variance between the learning strategies and the perceptions of assessment tasks, whereas the second canonical variate accounted for 9% of the common variance between the two sets of the variables.

Table 4: Canonical correlation analysis summary of learning strategies and perceptions of assessment tasks

| *Variable* | *Canonical coefficients of the first canonical variate* | *Canonical coefficients of the second canonical variate* |
|---|---|---|
| Learning strategies | | |
| Elaboration | .43 | - 1.49 |
| Organization | .56 | - .32 |
| Rehearsal | - .10 | 1.37 |
| % of variance | .76 | .0878 |
| Redundancy | .50 | .01 |
| Perceptions of assessment tasks | | |
| Congruence with planned learning | .19 | 1.61 |
| Authenticity | .39 | - 1.26 |
| Student consultation | .09 | .21 |
| Transparency | .26 | .17 |
| Diversity | .24 | .04 |
| % of variance | .71 | .05 |
| Redundancy | .47 | .01 |
| canonical correlation ( $R_c$ ) | .82 | .30 |
| Squared canonical correlation ( $R_c^2$ ) | .67 | .09 |

As shown in Table 4, the learning strategies associated with the first canonical variate were elaboration and organization; whereas the assessment variables correlated with the first canonical variate were authenticity, transparency, and diversity. Taken as a pair, high degrees of authenticity, transparency, and diversity in in assessment were associated with a strong reliance on deep learning strategies like elaboration and organization. The second canonical variate on the learning strategies was composed of elaboration and rehearsal, and the corresponding canonical variate from the assessment side was composed of congruence with planned learning and authenticity. A high degree of congruence with planned learning and a low degree of authenticity in the assessment tasks were associated with more reliance on surface learning strategies like rehearsal and less reliance on deep learning strategies like elaboration. The first canonical variate explained 76% of the variance in the learning strategies, and 71% of the variance in the assessment variables. The second canonical variate explained 8.78% of the variance in the learning strategies, and 5% of the variance in the assessment variables. The first and second canonical variates from the learning strategies extracted 50% and 1% of the variance in the assessment variables, respectively. The first and second canonical variates from the assessment variables extracted 47% and 1% of the variance in the learning strategies, respectively.

## DISCUSSION

Classroom assessment is a continual activity for teachers to improve the quality of instruction and motivate students to learn (Gronlund, 2006). A substantial proportion of the classroom time is devoted to the assessment for and of student learning (Crooks, 1988; Mertler, 2003). As such, it seems reasonable to argue that careful consideration of the students' perceptions of the assessment process is certainly warranted. Understanding students' perceptions is critical to understanding the consequential validity of the assessment process (Schaffner, Burry-Stock, & Cho, 2000). The present study examined the ways in which students' perceptions of the assessment tasks might relate to a particular set of motivational orientations and learning strategies using data from tenth grade students in English language classes.

Results from the canonical correlation analyses yielded one unique root that accounted for the common variance between students' perceptions of assessment and motivational orientations and two roots that accounted for the common variance between students' perceptions of assessment and learning strategies. The assessment-motivation root suggested that high degrees of authenticity and transparency in the assessment tasks were associated with positive students' judgments of their self-efficacy for learning the subject materials and positive students' beliefs about how interesting, useful, and important the subject materials are to them. According to McMillan and Workman (1998), student's self-efficacy is affected by the perceived characteristics of the assessment tasks. When students perceive the assessment tasks as being related to their everyday living, then they are likely to consider them as worthy of effort and to have a strong self-efficacy because they would tend to believe that the tasks are within their capabilities to do them well. Also, when students know in advance the scoring criteria of the assessment tasks, they are better able to discern what needs to be done (McMillan & Workman, 1998).

The assessment-learning strategies roots suggested that on one side high degrees of authenticity, transparency, and diversity in the assessment tasks were associated with a strong reliance on deep learning strategies like elaboration and organization; and on the other side a high degree of congruence with planned learning and a low degree of authenticity in the assessment tasks were associated with more reliance on surface learning strategies like rehearsal and less reliance on deep learning strategies like elaboration. From the standpoint of assessment, authentic tasks place high emphasis on understanding and transfer of learning to untaught problems rather than recall of factual knowledge, and as might be expected, these tasks require deep processing startegies (McMillan & Workman, 1998). Taking together, these results theoretically support educational perspectives of Ames (1992a), Brookhart (1997), and McMillan and Workman (1998) described early in this study regarding the role of classroom assessment in student motivation and learning. The results also add support to the previous studies investigating relationships between assessment and motivation (e.g., Alkharusi, 2009; Greene et al., 2004) and those examining relationships between assessment and learning strategies (e.g., Gijbels et al., 2008; Gulikers et al., 2006).

The results of the present study seem to have clear implications for classroom assessment practices. If students are to be encouraged to learn, then conditions that favor positive motivational orientations and deep learning strategies over negative motivational orientations and surface learning strategies are desirable. These conditions include asking students to do authentic assessment tasks linked to their real life experiences and that involve higher order skills such as prediction, debating, speculation, and problem solving. These tasks are likely to encourage students to focus on meaning and understanding of the subject materials rather than on memorization and simple application of rules, and are likely to stimulate students' interest and to develop confidence in their abilities (Hargreaves, Early, & Schmidt, 2002). Also, teachers can help students value the subject materials and develop confidence in their abilities to learn by using a variety of attainable assessment tasks and allowing a degree of student autonomy in the choice of the assessment tasks. These kinds of tasks might help reduce students' worry and concern over tackling the tasks and facilitate active processing of the learned materials (Ames, 1992a; McMillan and Workman, 1998). In addition, informing students about the purposes of the assessment and clearly communicating with them the assessment criteria might help students develop a sense of ownership in the assessment process, which in turn might make the learning environment more intrinsically motivating to students for learning (Shepard, 2000). Furthermore, providing students with clear informative feedback about their performance and progress on the assessment tasks are likely to direct students toward employing deep learning strategies and to cultivate in them more intrinsic interest on the tasks and high self-efficacy levels that they can successfully accomplish the tasks (McMillan and Workman, 1998; Schunk, 1991).

Although the correlational nature of the results does not permit causal conclusions, they help understand how the most silent aspects of the assessment tasks may relate in meaningful ways to student motivation and learning. Yet, a number of limitations exist in this study which could be considered in the future research. First, the generalizability of the findings may be limited to the small sample size of the tenth grade students in the English language subject. This might question the ability to replicate the findings in studies utilizing large sample sizes. In addition, past research has indicated that there might be differences in students' perceptions of the assessment environments, their motivational orientations, and learning approaches in various subject areas and across different grade levels (Bong, 2001; Marachi, Gheen, & Midgley, 2000). As such, our understanding could be enhanced by testifying the findings in various academic settings using large sample sizes. Second, this study examined the assessment context from students' perspectives, whereas teachers play a critical role in creating the assessment context, which in turn might have influences on students' motivation and learning outcomes. As such, future research might need to consider how the shared perceptions of the teachers and students affect student outcomes.

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