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The Relationship Between Classroom Assessment Practices and Student Motivation and Engagement: A Literature Review

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**The Relationship between Classroom Assessment
Practices and Student Motivation and Engagement**

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Introduction

Assessment is becoming increasingly important in classrooms as school systems respond to federal and state testing mandates. The increasing emphasis on assessment surely impacts student outcomes such as engagement and motivation, and ultimately achievement. While it is clear that classroom assessment is receiving more attention as a critical component of teaching that directly affects student learning, there is still a lack of systematic research that addresses many classroom assessment issues. There is some evidence that effective formative assessment enhances achievement (Black & Wiliam, 1998), and that certain grading practices result in greater student motivation and achievement (Brookhart, 2004b). However, researchers have not sufficiently investigated how classroom assessment and grading practices should be categorized, and have not demonstrated strong relationships between these practices and student self-efficacy and motivation at different grade levels.

Overview of the Conceptual Model

The following conceptual model provided the foundation for this study and was based on the self-system model of Connell and Wellborn (1991), as well as Eccles and Wigfield (1995) (see Figure 1). Both of these models highlight important links between the context, self, action, and outcomes in explaining the role of motivation and its relationships to other key educationally related variables.

Research has demonstrated a link between teachers' focus on mastery versus performance goals and teacher practices. According to Ames (1992) teachers' instructional practices and strategies have an impact on the types of goals students develop with regard to academic tasks. Specifically, the way students are evaluated and how students' achievements/progress is recognized can directly influence whether students form a mastery or performance goal orientation in the classroom. Midgley, Anderman & Hicks (1995) also support

a link between teachers' goal orientations, their instructional practices and student' self-system processes such as self-efficacy.

It is proposed that *teachers' grading and assessment practices* function as the context variables in the model. These include the type of assessments teachers use; their grading criteria, including whether effort is graded; the type, frequency, and manner in which teachers provide feedback; and the opportunities teachers' provide for students to self-evaluate or self-monitor their progress toward goals. Based on existing literature, teachers' grading and assessment practices are hypothesized to directly influence students' goal orientations because they communicate information to students about the relative importance placed by teachers on mastery versus performance goals in the classroom. Finally, the impact of grading and assessment practices on student motivation is also partially mediated by students' self-system processes, operationalized in this study as students' general self-efficacy beliefs with regard to classroom tasks.

In this study, student motivation was operationalized as the goal orientations (or reasons why) students choose to participate in classroom activities and complete academic tasks. Research on goal theory has identified two categories of goals – mastery and performance, although there is debate as to whether these are mutually exclusive categories or opposite ends of a continuum. In addition, researchers have distinguished between performance-approach and performance-avoidant goals.

According to the self-system model, student motivation influences student outcomes such as academic achievement not directly, but indirectly through the engagement of students in the classroom. Student participation in and behavior during academic tasks are believed to be the mechanisms through which students' goal orientations impact academic outcomes.

In the current model, the behavioral component of *student engagement* was the focus. Specifically, academic behaviors such as student effort, initiative-taking, attentiveness, participation, and persistence are operationalized. These behaviors have been identified most often in the literature as being those impacted by student motivation and are those that show the most consistent relationships to academic outcomes such as grades, achievement and school completion. Academic behaviors such as those identified are believed to be the overt actions students take with regard to academic tasks and are expected to be directly influenced by whether students have mastery or performance goals, and low or high self-efficacy. It is also postulated that they are indirectly influenced by the types of assessment (and learning) tasks presented by teachers; as well as how they are presented. Exactly which (as well as how) academic behaviors are influenced by students' goal orientations and teachers' grading and assessment practices have not been firmly established in the literature. Given the importance of student engagement in general, and academic behaviors in particular, as well as the wealth of education literature promoting different strategies to foster student engagement, it is important that we have a clear sense of what personal, instructional, social, and contextual factors affect 'what students do' in the classroom.

Finally, in an era of accountability, it is proposed that these teacher practices, student factors, and academic outcomes are related. Prior research has identified strong, consistent positive relationships between academic behaviors such as effort, initiative-taking, attentiveness and academic achievement regardless of how achievement has been measured. The current model defines academic achievement in terms of performance on the end of year Virginia Standards of Learning Tests (SOLs). Also, the use of subject area standardized tests in the middle and high school grades allows us to focus on students' self-efficacy, goal orientation, and academic behaviors in a specific domain.

Literature Review

Assessment practices

Selected or constructed response. The first dimension is whether the test items are selected-response or constructed response. Selected-response assessments are those in which students select an answer from choices that are provided (e.g., multiple-choice, binary choice, and matching). Constructed response assessments require students to supply an answer, whether as a short answer item or essays, projects/research, and performance assessments. The research demonstrates that there is considerable variation in the extent to which different kinds of assessments are used across different disciplines (McMillan, 2001, 2002).

The literature suggests that motivation is generally greater when the constructed response format is used (Brookhart & Durkin, 2003; Ormrod, 2006). Generally, but not always, the students rated themselves higher on mastery goals after completing performance assessments. There is some indication that constructed response items and performance assessments are related to an increase in student mastery goal orientation and self-efficacy, while traditional objective tests are negatively related to self-efficacy and mastery and performance goals (Brookhart et al., 2003).

Student Self-Evaluation. Student self-evaluation, self-monitoring, or self-reflection, typically requires students to rate their own performance against an established rubric or set of standards to determine what they need to do to enhance their understandings, skills, and performance. Shepard (2000) summarizes research that indicates that students who practice self-evaluation are more motivated and interested in substantive feedback than students who do not self-evaluate. Shepard maintains that self-evaluation improves students' responsibility for their learning. As students internalize the criteria for evaluating their work they are better able to connect their performance with their preparation, which enables the development of an internally

oriented, controllable sense of self-efficacy (Stiggins, 2005). The research suggests that when students self-evaluate, they stay focused on what they need to do to improve. They are more motivated and have a strong sense of self-efficacy. Some research finds that this is especially true for low ability students (Ross, Rolheiser, & Hogaboam-Gray, 1998).

Authenticity. A third important dimension of classroom assessments is the extent to which the item and/or task is authentic. Authentic assessment reflects “real world” issues, problems, and situations, and usually requires students to apply deep understandings. Assessments that are not authentic typically use content that does not relate to students in a meaningful manner. For example, science can be assessed using multiple-choice tests that concentrate on basic terms (unauthentic) or through a performance assessment project in which actual data are gathered from a known location (authentic).

Authentic assessments enhance motivation by emphasizing real life activities or situations, which increases student perceptions of the importance, utility, and value of the content being assessed. It is well-established that these perceptions are essential to motivation because they represent a dimension of motivation consistent with the expectancy-value framework (McMillan, 2004).

Level of Difficulty. A fourth dimension relates to the difficulty of the assessment. It can be theorized that assessments that are either too easy or too hard mitigate student motivation (Bonesronning, H., 2004). In contrast, moderately difficult assessments improve motivation (Pintrich & Schunk, 2002). Tasks that are too easy do not challenge students nor, when successfully completed, do not inform the student about how they have changed or developed. Tasks that are too difficult may cause students to become confused and frustrated, resulting in less effort. Moderately difficult tasks encourage student attributions to effort, which enhances

student self-efficacy. Motivation is greatest, then, in situations in which students learn, by applying some effort, that they are capable of successful performance.

Formative Assessment. A fifth way to categorize assessment practices is the extent to which formative assessments are used. Formative assessment is typically informal and occurs during instruction as students learn. Formative classroom assessment has been identified as a set of activities that is undertaken by teachers to be able to design instruction to meet student needs and provide feedback to students to enhance their motivation and learning (Black & William, 1998; Brookhart, 2005; Chappuis & Stiggins, 2002; McMillan, 2003). These assessments include informal observation, quizzes, homework, and oral or written classwork. Evidence of student learning is used on a daily basis to inform teachers about student performance as learning occurs. Research finds empirical support for a positive relationship between the use of effective formative assessment and student motivation and achievement (Black et al., 1998; Brookhart, 2005)

Teacher Feedback. Finally, feedback has long been regarded as an essential component of the instructional and assessment process and is broadly recognized as a mechanism to support student learning. The specific nature and content of feedback teachers provide determines the impact it has on student learning. Comments that are specific, informative and tailored to each individual student's performance have been shown to be most effective in promoting improved outcomes. This type of feedback provides students with specific information about the positive aspects of their performance as well as the targets areas for improvement while including suggestions for how they can enhance their performance. Ovando (1992) further described meaningful teacher feedback as having the following characteristics: relevant, immediate, factual, helpful, confidential, respectful, tailored, and encouraging. Research has shown that specific, meaningful teacher feedback is a powerful tool classroom teachers can employ to

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support student learning and enhance achievement and subject-specific attitudes (Butler, 1987; Elawar & Corno, 1985; Krampen, 1987). On the other hand, feedback that emphasizes grades, praise, and how performance compares to that of classmates has a negative effect on student attitude and achievement. The effects of feedback are particularly noticeable for lower ability students.

Grading Practices

Once information about student proficiency is gathered through the application of appropriate assessment techniques, teachers evaluate student work, assign grades and give feedback to students. The aspects of grading with the greatest relevance to motivation can be organized into two areas: the nature of the comparisons used and factors that are used by teachers to determine grades.

Bases Used for Comparison

Brookhart (2004) points out that there are essentially three methods for determining grades – criterion (standards) referenced, norm-referenced, and student self-reference. The recent emphasis on standards promotes a criterion-referenced basis for comparison in giving grades. With this approach, grades are determined by comparing achievement to established levels of proficiency rather than with the achievement of other students. Thus, if all students reach the level of proficiency designated as A, all students would achieve that grade. There is some evidence that using criterion-referenced approaches results in stronger motivation as well as higher achievement (Brookhart, 2004). Criterion-referencing seems to be most effective for motivation when standards are high and attainable with moderate effort (Crooks, 1988). This approach also allows for opportunities for assessment retakes so that there are multiple opportunities to achieve a higher grade.

In norm-referenced grading, grades are determined by how students compare to each other. High grades are given to students who perform the best, low grades given to students who perform poorest. Research suggests that heavy reliance on norm-referenced grading focuses motivation on performance goals (as opposed to mastery goals) by emphasizing competition and focusing on performance rather than competence or mastery (Shunk, 1995; Stipek, 2002; Stiggins, 2005).

Factors Used to Determine Grades

The literature on grading strongly supports the finding that teachers believe it is important to combine non-achievement factors, such as effort, ability, and conduct, with student achievement, to determine grades (Brookhart, 1993 & 1994; McMillan, 2001, 2002; Stiggins, Frisbie & Griswold, 1989). Measurement specialists often consider this a “hodgepodge” approach to grading (Brookhart, 1993; Cross & Frary 1996; Friedman and Manley, 1991; Frary, Cross & Weber, 1993; McMillan, 2001, 2002; and Truog and Friedman, 1996). Second, the literature supports the detrimental impact of using zero in the calculation of grades (Brookhart, 2004; McMillan, 2004; Stiggins, 2005). A zero reduces the accuracy of grades as a measure of achievement because it confounds behavior management and punishment with achievement. Third, the literature finds that there is a great amount of variation between teachers on the weight given to different grading factors (Brookhart, 1994; Cizek, Fitzgerald, & Rachor, 1995; McMillan 2001, 2002). Nevertheless, while descriptions of grading practices are plentiful, there is little research on the relationship between grading practices and student motivation. There is a strong research base with respect to the two major contributors to motivation (self-efficacy and importance, utility, and value), but not much about how specific assessment and grading practices effect these two components.

The use of performance-based or more authentic assessment tasks, incorporation of student self-evaluation, and provision of specific, meaningful feedback are all anticipated to promote mastery versus performance goals and improve students' sense of self efficacy, which also leads to more mastery-focused goal orientations. Classroom assessment tasks that are viewed as less competitively structured (e.g., more criterion-referenced, involving absolute interpretations) are deemed to be those most likely to foster mastery goals, promote self-efficacy and student participation, ultimately leading to enhanced academic achievement.

Student Motivation

Student Self-efficacy. Self-efficacy refers to a person's belief that he or she has the capability to perform well (Bandura, 1989). A person with self-efficacy is more likely to take on a challenging task if he or she feels capable of completing it. According to Bandura, the stronger a person's self-efficacy is, the stronger his or her level of motivation, effort, and perseverance.

Some classroom assessment practices have been found to affect student self-efficacy. For example, the type of feedback that students receive can affect their self-efficacy. When students receive rewards contingent on performance rather than merely on task engagement, it increases self-efficacy because it indicates task mastery (Shunk, 1991). Shunk and Swartz (1993) argue that feedback about the value of a chosen strategy, and progress in mastery raised self-efficacy. In addition, students who had a process goal, and received process feedback, had higher judgments of self-efficacy on the post-test and showed higher scores on the skills assessed.

Rodriguez (2004) examined the role of classroom-level assessment practices on student achievement, and looked at the mediating roles of student perceptions of self-efficacy and effort. The study found that for students who were embedded in classrooms that relied heavily on the use of teacher-made objective tests, the positive effects of perceived self-efficacy on

achievement was reduced, and students attributed success or failure to uncontrollable variables (e.g., doing well is a function of natural talent and good luck, rather than studying hard).

Self Efficacy and Achievement Motivation

Some research suggests that self-efficacy may mediate students' achievement goal orientations (Middleton, Kaplan & Midgley, 2004; Skaalvik, 1997, Wolters, 2004). Pintrich and DeGroot (1990) found that students who reported higher self-efficacy also reported higher levels of interest and preference for mastery goals, as well as more frequent use of self-regulatory strategies. In addition, both self-efficacy and intrinsic value were positively correlated with all measures of academic performance (seatwork, exams/quizzes, essay/reports, and semester grades). However, when included in regression analyses with self-regulation and cognitive strategy use, these variables were not significant predictors of academic performance. Although this result contradicts prior findings suggesting that self-efficacy has a direct relationship with achievement (see Lau, Roeser, & Kupermintz, 2002); it supports the idea that "how" students engage in academic tasks mediates the relationship between self-efficacy and academic outcomes.

The existing research clearly identifies the importance of self-efficacy to students' motivational goals, as well as academic achievement. In addition, some evidence indicates that the types of assessment tasks, along with teacher feedback are important determinants of students' self-efficacy. However, it is unclear how other assessment and grading practices influence self-efficacy. Finally, empirical research has not yet established the mechanisms whereby self-efficacy affects motivation and subsequent achievement, though a mediational role is suggested by some research.

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The Goal Theory Perspective on Motivation

While numerous theories of motivation exist, social-cognitive theories, such as goal theory have much to say about how school environments and teacher practices affect student motivation to learn. Goal theory is so powerful that it has formed the basis for classroom level (e.g., Ames, 1992c) and school level (e.g., Maehr & Anderman, 1993) reforms. Anderman and Maehr (1994) argue that goal theory is one of the more prominent developments in motivation research since the mid 1980s.

The goal theory perspective (Anderman et al., 1994) suggests that students' goal beliefs are influenced by school context variables that shape the kind of tasks given to students, how they are presented, and how students' ability is conveyed, etc. In turn, the goals that students adopt are related to student self-efficacy, the cognitive strategies that they use, student engagement, student affect, etc. While a number of goals can be associated with schooling, including social goals, the research has focused primarily on two types of goals. Those goals are discussed in the literature as task, mastery, or learning goals and as ability, performance, or ego goals. Recently authors have separated ability goals into two types: performance-approach goals and performance-avoidance goals (Pintrich, 2000b; Midgley, Kaplan, & Middleton, 2001). As Anderman et al. (1994) point out, mastery and performance goals are not mutually exclusive as if at opposite ends of a continuum. Instead, they are best understood as orthogonal.

Mastery Goals

Students with mastery goals typically show a cluster of characteristics that are considered most adaptive to learning. Elliot and Dweck (1998) argued that students with mastery/learning goals work to develop their abilities. They are more likely to choose tasks of moderate difficulty, and are willing to make mistakes in the quest for mastery. When learning/mastery goals were highlighted, children's beliefs about whether they had high or low ability were

irrelevant (Elliot et al, 1998). In both cases, students sought to increase competence by taking on challenging tasks, using opportunities to increase skill, developing more sophisticated problem solving abilities, and accepting mistakes as opportunities to learn.

Maehr and Anderman (1993) found that students with task focused goals learn for the sake of learning, and show interest in problem solving and challenge. They are more likely to strive to understand the material and use effective learning strategies. Furthermore, Midgley, et al. (2001) argues that students with mastery goals are more interested in developing their competence and gaining understanding and insight.

Performance Goals

Students with performance goals work to maintain positive judgments of their ability from teachers, parents, and peers. These students are more likely to take on easy tasks and avoid making mistakes. When mistakes are made, students develop debilitating responses, including giving up (Elliot et al., 1998). They also focus on demonstrating their ability, doing better than others, and getting high grades (Midgley, et al., 2001). They were more likely to use surface level strategies and avoid problem solving and critical thinking. These students also were less likely to pursue challenging activities and tasks (Maehr et al.,1993). Performance goals are consistently associated with the use of self-handicapping strategies, the avoidance of novelty and challenge, the avoidance of help seeking behavior, the use of cheating, and a reluctance to cooperate with peers (Midgley et. al.).

The literature has also found that performance goals do appear to have some positive outcomes in some contexts. Hence some authors have considered separating performance goals into two types: performance-approach goals and performance-avoidance goals (Pintrich, 2000b).

Furthermore, the most recent adaptation of the PALS instrument distinguishes the two (Midgley, Maehr, Hruda, Freeman, Gheen, Kaplan, Kumar, Middleton, Nelson, Roeser, & Urdan, 2000).

Students with performance approach goals are more concerned with doing better than others, demonstrating their ability and competence. Some research finds that performance-approach goals alone, may be adaptive for high ability students (Bergin, 1995; Smiley & Dweck, 1994). Other research suggests that performance goals are less detrimental to elementary aged students, and this may reflect the distinction between performance-approach and performance-avoidance goals (Midgley et al. 2001). Midgley et al. conclude that the data in support of the adaptive nature of performance-approach goals is inconsistent, and needs further research.

Students with performance avoidance goals are more concerned that they not look incompetent or stupid. They tend to avoid tasks that will lead to negative judgments of their ability. Students with performance-avoidance goals have consistently been found to have maladaptive approaches to learning (Elliot & Harackiewicz, 1996; Skaalvik, 1997).

While the need for two types of performance goals is mixed in the literature, clearly additional research will be helpful. In addition, research should examine grade and gender differences and how students perform with a combination of goals (Anderman, Austin, & Johnson, 2000).

Developmental Issues within Goal Theory

The negative effects of performance goals for elementary-aged students was observed in a study by Anderman, Eccles, Yoon, Roeser, Wigfield, and Blumenfeld (2001). When teachers reported that they emphasized performance-oriented instructional strategies such as emphasis on high test scores and that students should perform as well as the best students, the valuing of mathematics and reading declined over the academic year. The negative effects of performance

goals are also noticeable with middle school students. For example, Anderman, Griesinger, and Westerfield (1998) noted that academic cheating may be related to performance goals.

Research indicates that as students move into adolescence, they endorse performance goals more and mastery goals less (e.g. Anderman & Anderman, 1999). This shift seems to be in response to changes in the expectations of schools and teachers, in that middle school teachers use instructional practices that induce performance goals more. Roesser, Midgley, and Urdan (1996) also found that students who perceived schools as endorsing performance goals also tended to endorse them as well. Similarly, when schools endorsed mastery goals, students tended to do well.

Little research has followed students across the transition into high school (Anderman, Austin, & Johnson, 2001). One exception is Gheen, Hruda, Middleton, and Midgley (2000, as cited by Anderman et al., 2000) which found that students reported a decrease in their perception of an emphasis on performance goals, and some reported an increased emphasis on mastery after the transition to high school.

Effects of Assessment Practices on Student Goal Orientation

The evaluation of student learning is one of the more salient instructional practices that can influence students' motivational goals. Ames (1992a) identifies evaluation strategies that support mastery goals:

1. evaluate student progress, improvement and mastery
2. give students opportunities to improve; treat mistakes and errors as part of learning
3. vary methods of evaluation, including only feedback for some assessments rather than grades
4. make evaluation private

nd Anderman & Midgley (1998) add others as they discuss implementation of a mastery/learning focus in middle schools.

- e in
5. use alternatives to tests, such as portfolios,
 6. grade for progress and improvement and involve students in determining their grades

It is not just how students are evaluated that is important, but also the type, form, and purpose of evaluation. As Mac Iver (1987) notes, students' perceptions and interpretations of the meaning or intent of the evaluation may be more important than what is actually done. He suggests that evaluation systems also need to:

1. reduce normative evaluation approaches (the most common form of evaluation in school)
2. avoid announcing the highest or lowest grade,
3. avoid only posting perfect papers

on
er Kaplan and Maehr (1999) suggest that evaluation strategies should measure progress and improvement over past performance. They should be based on specific and absolute standards. They should reward students who collaborate across groups. Evaluative criteria should employ a variety of practices that reduce feelings of threat and reward students who learn from their mistakes.

Stefanou and Parkes (2003) found that when students had paper and pencil tests and performance assessments, it tended to foster mastery goals. Interviews suggested that students were concerned about how performance assessments would affect grades. They also preferred paper and pencil tests because they were a familiar format that indicated mastery to them. With performance assessments the students seemed concerned about the ambiguity of what the teacher wanted and how it would affect their grades. When grades were removed from the equation, students showed more favorable orientation to performance assessments. "What seems to be emerging is that it may not be so much the assessment format per se that influenced the goal

orientation of students but the assessment format in interaction with the stakes or consequences attached to the results of the assessment (p. 158).”

Meece (1994) found that teachers whose students were high in mastery goals promoted the importance of meaningful learning in their classrooms. Students were expected to understand the material, synthesize it so that they could make sense of it, and apply it. Grades and extrinsic incentives were rarely used in an effort to motivate students. In low mastery classrooms a high emphasis was placed on grades and performance.

Evaluation practices have been found to have a clear impact on whether students adopt mastery goals or performance goals. In general, research suggests that teachers should avoid practices that compare students with one another, emphasize student progress, improvement, or mastery, and use more criterion referenced approaches.

Student Engagement

Current research identifies three distinct components of student engagement – behavioral, affective, and cognitive (see Fredericks, Blumenfeld & Paris, 2004; Furlong, Wipple, St. Jean, Simental, Soliz, & Punthuna, 2003). The behavioral component is comprised of both academic (e.g., effort, attentiveness, initiative-taking) and social behaviors (e.g., disruptiveness, working collaboratively with peers) (Finn, Pannozzo, & Achilles, 2003; Jimerson, Campos & Grief, 2003; Johnson, Crosnoe & Elder, 2001). The affective component is linked to students’ feelings about school in general, but it is also specifically tied to the classroom and peers. Typically, it encompasses beliefs about such things as belongingness, valuing, attachment, and identification (Goodenow, 1993; Maddox & Prinz, 2003; Voelkl, 1997). The cognitive component, relates to students’ thought processes, usually in relation to specific academic tasks or content (Newmann, Wehlage, & Lamborn, 1992).

s For this study, the behavioral component, specifically academic behavior of student
engagement is the focus. Behaviors such as paying attention in class, putting more than the
l minimal levels of effort into assignments, independently initiating participation in academic
tasks, and continuing to work through tasks in the face of difficulty all directly impact students'
learning of academic content. These behaviors facilitate the construction of new knowledge and
understanding by helping students interact with content during academic tasks; and are those
frequently referenced in the literature in relation to student motivation.

The majority of research on academic behavior has focused on the relationship between
student (in)attentiveness and academic achievement. Both large- and small-scale studies have
or demonstrated that student attentiveness is associated with higher student achievement; and this is
consistent across all grade levels (Finn, Pannozzo & Voelkl, 1995; Marks, 2000; McDermott &
Beitman, 1984; Peterson, Swing, Stark, & Waas., 1984; Rowe & Rowe, 1992, Wentzel, 1993).
In addition, these relationships remain consistent regardless of whether student engagement is
ral, rated by teachers or outside observers (see Alexander, Entwisle, & Dauber, 1993; Finn et al,
1995; Rowe et al., 1992; Wentzel, 1993) or student self-reports (see Marks, 2000). Additionally,
c Rowe et al. (1992) and Marks (2000) both found that the relationship between academic
behaviors and academic achievement were typically stronger as students got older.

igs The Relationship of Student Engagement to Student Motivation

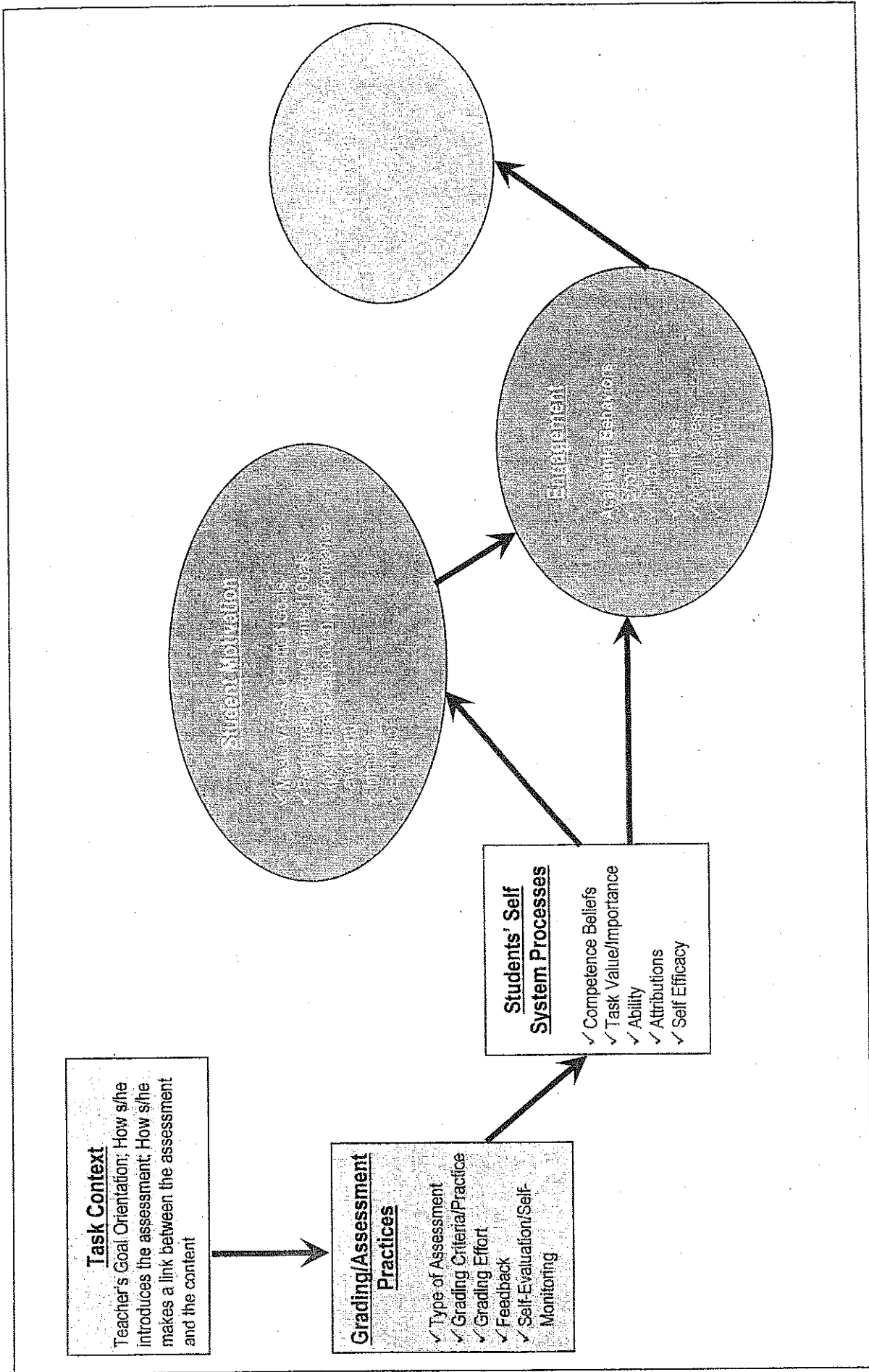
t In this study, student engagement and motivation are conceptualized as distinct, but
on related constructs. Motivation has been defined as students' goals or underlying reasons why
o they choose to participate in classroom activities and complete academic tasks. Engagement is
m, the participation in classroom activities and academic tasks on some level, be it behaviorally,
affectively, cognitively, or some combination of these. Prior research has found that whether
students adopt mastery/task versus performance/ability, the oriented goals are significantly

related to the amount of effort, persistence, initiative-taking, etc. the students demonstrate during academic tasks.

Research Questions

1. How do teachers determine grades?
2. What types of assessment practices do teachers use?
3. What are teachers' goal orientations?
4. What are student self-reported levels of engagement, self-efficacy, and goal orientation?
5. What are student perceptions of their teachers' goal orientations?
6. What is the relationship between teacher grading practices and student motivation?

Figure 1: Conceptual Model - The Influence of Teacher Grading & Assessment Practices on Student Motivation, Engagement and Achievement



Methodology

Procedures

During the fall of 2006, superintendents of local school districts from a metropolitan area in central Virginia were contacted to determine their level of interest in the study. There was overall support for the study and schools within each division were purposively identified for participation to ensure diversity of the student sample. Schools then elected to participate in the survey administration resulting in a volunteer sample of convenience.

Researchers arranged to meet with teachers during their monthly staff meeting to explain the purpose of the research, the administration procedures, as well as, answer questions and assure confidentiality and voluntary participation. Teachers received a packet of administration instructions containing: a teacher letter, teacher consent form, instructions for administration, parent letters, script to obtain student assent, student assent forms, and surveys. Teachers were consented by the researchers at the end of the informational meeting.

Teachers sent home the parent information letters approximately two weeks prior to the survey administration. Parents were instructed to contact their child's teacher or primary investigators identified on the letter if they had any questions or did not want their child to participate in the study. Teachers first obtained written assent from students and then verbally reviewed instructions for completing the surveys.¹ Secondary teachers administered the student surveys to students for whom assent was obtained in their first period academic class and sealed the responses in an envelope. Elementary teachers administered surveys to students at a time they agreed was least disruptive and were given the option of reading the questions aloud to students. Elementary teachers in the same grade administered surveys at the same time.

¹ Teachers in grades 4 and 5 read the survey items aloud to students; it was suggested that when possible teachers should administer surveys to each other's classes rather than their own classes.

Each student was instructed to put their survey in a class envelope upon completion. This envelope was then sealed. Assent forms were sealed in a separate envelope. After sealing their own survey in a separate envelope, teachers returned all unmarked envelopes to the main office of the school. Researchers then returned to collect all packets from the school office. Each survey was coded in a way which would preserve student and teacher anonymity, while enabling researchers to match the student survey data to the teacher data.

In order to capture the student/teacher relationship, a key aspect of the procedure was that students were asked to complete the surveys in their classroom and make their responses specific to that class. Teachers were also asked to respond with that class in mind. Class averages were computed for students so that the unit of analysis was the class, not individual students, in relating student motivation to teacher assessment practices.

Participants

Sample characteristics indicate variability in experience, classroom settings, student ability, subject area, and grade level as well as representation of the student population of the four school districts. The 4,278 fourth through twelfth-grade student participants in this study came from 6 elementary schools ($n = 1,036$), 3 middle schools ($n = 1,764$), and 2 high schools ($n = 1,478$) from a metropolitan area in central Virginia during the 2006-2007 school year. The participants were evenly distributed across grade levels with the eighth grade sample being the largest (16.6%) and the eleventh grade representing the smallest sample (7%). There were a total of 209 participating teachers representing elementary ($n = 48$), middle ($n = 75$) and high schools ($n = 86$) (Table 1). For the purpose of this study, students in grades 6-12 are referred to as "secondary" level students. The schools represent 4 school districts.

Table 1

Participants by School Level

	<u>Students</u>		<u>Teachers</u>	
	<i>n</i>	%	<i>n</i>	%
Elementary School	1,036	24.2	48	23.0
Middle School	1,764	41.2	75	35.9
High School	1,478	34.1	86	41.1
Total	4,278		209	

Table 2 reports demographic information on both students and teacher participants. Students reported their ethnicity as White ($n = 2,113, 52\%$), African-American ($n = 1,367, 34\%$), Hispanic ($n = 206, 5\%$), Asian-American ($n = 115, 3\%$), Native- American ($n = 55, 1\%$). The remaining students reported being "Other" ($n = 195, 5\%$). The participants were evenly distributed between males and females. Teachers reported their ethnicity as White ($n = 183, 88\%$), African-American ($n = 21, 10\%$), and Hispanic ($n = 2, 1\%$). The remaining teacher selected "Other." The majority of teachers possess greater than 23 years of classroom experience with the average for the sample being 14 years. The majority teach standard or regular classes (55%) and 27 percent teach advanced or honors courses. Teachers working with basic skills/remedial students comprise 8 percent and blended/inclusion settings account for 10 percent. These participants were 80% female and 20% male.

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Table 2

Participants by Race/Ethnicity

	<u>Students</u>		<u>Teachers</u>	
	<i>n</i>	%	<i>n</i>	%
White	2,113	52	183	88
African-American	1,367	34	21	10
Hispanic	206	5	2	1
Asian-American	115	3	--	--
Native-American	55	1	--	--
Other	195	5	1	<1
Total identified	4,051		207	

Measures

The purpose of the study was to examine the relationship between teacher grading and assessment practices and student motivation and engagement in school. Two self-report survey instruments, a student survey and a teacher survey, were used to gather information for the study.

Student Survey

The student survey collected information on four demographic characteristics: grade level, gender, race, and the class name (i.e., math, English, etc.), and included 37 five-point Likert-scale items to measure student perceptions of: 1) their levels of motivation, self-efficacy, engagement, 2) goal orientation, and 3) their teacher's grading and assessment practices. The first ten questions asked students to report the frequency of their classroom behaviors by asking students what they do in the class regarding class work, participation, and effort using a 5-point Likert scale (1 = never to 5 = always). The next section included eighteen questions asking students to rate their level of agreement

from 1 = strongly disagree to 5 = strongly agree with statements regarding their goals and self-perceptions of competence in that class. The final nine questions explored students' perceptions of their teacher's purposes for learning on a 1 (strongly disagree) to 5 (strongly agree) scale measuring teacher behavior. These questions were based on definitions of mastery and performance goal orientations from research on goal theory.

Student survey variables. The dependent variables in this study were: student self-efficacy, engagement, mastery goal orientation, and performance goal orientation. These were scales created by combining individual questionnaire items from the student survey that measured the construct of interest. However, before conducting any statistical analyses, the underlying factor structure of the secondary level student data as it aligned with the theoretical literature was explored. The elementary data did not support the use of factor analysis and the subscales reflect the original groupings upon which the survey was based. To examine the factor structure of the student survey, scores on the last 28 items of the student survey were analyzed using principal components extraction with orthogonal rotation (varimax) to confirm the presence of the aforementioned subscales. The initial extraction revealed six components with eigenvalues over 1.0. Items were retained for later analyses if they had a factor loading of .50 or higher and if the loading on another factor was no higher than .30, or if they were theoretically relevant. This resulted in 22 items for a second factor analysis. The final scale included four components, which accounted for 54% of the variance. Items and factor loadings are reported in Table 3. This results in different items within the scales for elementary and secondary samples and the specific differences are discussed below.

Table 3
Items and

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Table 3
Items and Factor Loadings

Item	Factor loadings			
	1	2	3	4
It's important to me that other students in my class think I am good at my class work.	.64	.20	.08	.10
I don't want my teacher to think I know less than other students in class.	.49	.12	.04	.13
One of my goals is to show others that class work is easy for me.	.72	.14	.08	-.05
It's important to me that I don't look confused in this class.	.73	.03	.06	.03
It's important to me that I look smart compared to other students in my class.	.82	0	.09	-.01
I don't want anyone in the class to know if I'm having trouble doing the work.	.66	-.04	-.07	0
One of my goals is to look smart compared to other students in this class.	.82	-.02	.06	-.03
One of my goals is to show others that I'm good at my class work.	.76	.17	.11	-.01
It's important to me that I learn a lot in this class.	.08	.75	.16	.15
It's important to me that I completely understand my class work.	.12	.57	.27	.24
One of my goals is to learn as much as I can in this class.	.08	.81	.22	.15
It's important to me that I improve my skills in this class.	.12	.78	.06	.07
I am certain that I can understand the ideas taught in this class.	.03	.04	.67	.26
I expect to do well in this class.	.10	.38	.66	.11
I'm sure I can do an excellent job on the work in this class.	.11	.19	.76	.14
I know that I will be able to learn the material for this class.	.06	.19	.75	.17
I think that I will receive a good grade in this class.	.07	.14	.78	.09
If I can't understand an assignment at first, I keep going over it until I understand it.	.04	.21	.08	.66
I would rather do assignments that are challenging than assignments that are really easy.	.04	.20	.18	.53
If I don't know the answer to a question, I try to figure it out on my own.	.08	.03	.12	.58
I stop trying when the assignment or homework is very difficult. (R)	.00	.11	.11	.69
I give up when I make mistakes. (R)	-.05	.06	.13	.62

Self-efficacy. Students' sense of self-efficacy was measured using a Likert scale to measure students' perceptions of their ability to successfully complete tasks in class. The five items in this scale were adapted from Pintrich & DeGroot (1990) to reflect student perceptions within the immediate context. The survey items have reliability of .82 for the secondary student data and .76 for the elementary data. This scale emphasized student feelings, or efficacy, toward future performance in the class. Examples of questions in the self-efficacy scale included "I am certain I can understand the ideas taught in this class" and "I expect to do well in this class."

Student engagement. For the elementary data, student engagement was measured based upon the theoretical and conceptual foundation on which the original survey items were developed. The elementary data did not support separate factors to measure engagement. For the elementary sample, engagement was measured using ten items adapted from the Student Participation Questionnaire (SPQ) (Finn, Folger & Cox, 1991). Students were asked to respond to questions about the frequency of their class behaviors using a 5-point Likert scale reflecting judgments from 1 = never to 5 = always. The questions targeted the affective and behavioral components of engagement and the items result in a combination of effort, initiative, and non-participatory behavior which reflect student engagement. For the elementary sample the ten items had an internal consistency, as measured by Cronbach's alpha, of .65. Examples of the questions used included "I try hard when I do my homework" and "If I can't understand an assignment at first, I keep going over it until I understand it."

The secondary student data did support multiple factors to measure engagement and, based on factor analysis, the scale is termed *persistence*. Of the ten items in the original scale, the items which emerged during the principal components analysis indicated there were 5 theoretically relevant items with factor loadings greater than .50. These five items within the engagement subscale had Cronbach's Alpha of .65 and were used for the secondary level analysis. Examples of questions were

“I give up when I make mistakes” (reverse coded) and “I give up when the assignment is very difficult” (reverse coded).

Student *mastery orientation* was measured based on student reports of their reasons for gaining knowledge or skills in the class. The five items in the scale were adapted from the Patterns of Adaptive Learning Survey (PALS) (Midgley et. al, 2000) by changing the Likert scale and the wording of some questions and included questions such as “One goal is to gain new skills in this class” and “It is important to me that I completely understand my class work.” For the elementary sample, the combined items have a Cronbach’s alpha of .74. The reliability of the items for the secondary sample, using the same items, was .80.

Student performance approach orientation and *student performance avoidance orientation* were viewed as separate constructs in the literature and the PALS survey, upon which the current instrument was based. Both performance orientations emphasize the peer aspect of performance; performance approach students seek to outperform their peers. Conversely, performance avoidant students seek to avoid appearing less competent than their peers. For the elementary sample, the constructs were measured separately with performance goal orientation using five items and the performance avoidant using three. As with the mastery scales, the Likert response scale was changed, most questions were somewhat reworded, and one question was eliminated from the performance-avoidance scale. Cronbach’s alpha indicates reliability of performance avoidant questions at .634 and approach was .844. Examples of performance approach questions are “It is important to me that other students in my class think I am good at my class work” and “It is important to me that I look smart compared to other students in the class.” Based on the factor analysis, the secondary data scale indicated that both approach and avoidant shared a latent structure and were combined to represent a *performance orientation*. This scale was comprised of 8 questions with an alpha level of .86.

Student perceptions of teachers' goal orientation were measured similarly to the student goal orientations in order to capture students' perceptions of the learning environment in the classroom. Scales were again adapted from the PALS (Midgley et al., 2000). Student perceptions of teacher mastery orientation were measured using four items, for example, "My teacher thinks mistakes are okay as long as we are learning" and "My teacher compliments students when they try hard even if they don't get the answers right." Cronbach's alpha for the items was .65. Students' perceptions of teacher performance orientation were based on five items, for example, "My teacher tells us the students who get good grades are an example for all of us," and "My teacher tells us it is important we learn what is being taught because it will be on the SOL test." Cronbach's alpha for these items was .54.

Teacher survey. The assessment questions on the teacher survey were adapted from a prior study on grading and assessment practices (McMillan, 2001; 2002). The original survey was developed based on literature and reviewed by eight educators involved with the public school system. The survey was pilot tested with 33 teachers across elementary, middle, and high school and had internal reliability of .80. The teacher survey included eight demographic questions to gather grade, content, and ability level taught. Teachers also indicated their gender, race, number of students and number of years taught and whether or not the course was preparing for the Standards of Learning (SOL) tests. All questions prompted participants to report for the specific class they were in. There were 58 five-point Likert scale items. The first eleven questions measured the frequency of use of factors teachers consider when determining grades using a scale from 1 = not at all to 5 = extensively. These questions included observable student behaviors and grading practices such as extra credit or inclusion of zeros. Thirty-five questions examined the frequency of use of different types, formats, and use of assessments. For example, graded homework, and tests of varying difficulty. Twelve

questions explored teacher agreement with specific approaches to instruction and teachers responded to the questions from 1 = strongly disagree to 5 = strongly agree. These questions focused on how teachers establish the purpose for learning in their classrooms based on their pedagogical beliefs.

Subscales to evaluate teacher mastery and performance orientation were adapted from the PALS (Midgley et al, 2000). This construct was measured based on responses to questions indicating whether assessment and grading practices promote self-referential learning focused on knowledge acquisition and foster mastery orientations in their classrooms. Teachers who utilize grading and assessment practices that emphasize the comparison of performance among students foster student goal orientations that focus on performance and competition among classmates. The mastery scale was calculated based on 6 items with a Cronbach's alpha of .68. Examples of items from this scale are "I make a special effort to recognize students' individual progress even if they are below grade level" and "I tell students it's important to learn what is being taught because understanding the material is important." Teacher performance orientation was based on 5 items with a Cronbach's alpha of .65. Examples of items are, "I help students understand how their performance compares to others" and "I display work of the highest achieving students as examples for other students."

Elementary Results

Elementary Sample

Teachers. A total of 48 teachers in grades 4 and 5 from six local elementary schools completed surveys. Selected characteristics of the teacher sample can be found in Table 4. The average class size was 22.2 students, and ranged from 14 to 28 students. Teachers were split relatively equally by grade, with grade 4 teachers comprising 52.1%, and grade 5 teachers comprising 47.9%, of the sample. In terms of gender and ethnicity, the sample was overwhelmingly female (93.7%), and relatively homogenous. The majority of teachers were white (87.5%) and the remaining teachers were African

American. Finally, teachers reported anywhere from two to 34 years of prior teaching experience (mean = 14.1 years).

Table 4

Selected Demographic Characteristics of the Elementary Teacher Sample

<i>Characteristics</i>	<i>Elementary Teachers (n = 48)</i>	<i>Elementary students (n = 1,036)</i>
Grade 4	52.1%	54.4%
Grade 5	47.9%	45.6%
Male	6.3%	50.8%
Female	93.7%	49.2%
African American	12.5%	30.9%
White	87.5%	54.8%
Hispanic	n/a	7.0%
Other ^a	n/a	7.3%
Teaching Experience (yrs.) ^b	14.1	n/a
Class Size ^b	22.2	n/a
Schools	6.0	n/a

Notes: a. "Other" includes small percentages of students who selected Asian American or Native American.

b. Means are reported. Teaching experience ranged from 2-34 years; Class size ranged from 14-28 students.

Students. Selected student characteristics are also presented in Table 4. A total of 1, 036 students completed surveys, with a slightly higher percentage of students in grade 4 (54.4%) than grade 5 (45.6%). Students were split relatively evenly by gender across the two grades (50.8% and 49.2%, respectively). In comparison to teachers, students reported more diverse ethnic backgrounds. White and African American students were the two largest groups, accounting for 54.8% and 30.9%, respectively. The remaining students indicated they were Hispanic (7.0%) or Other² (7.3%).

² This category also included small percentages of students who selected Asian American or Native American.

ience

How Elementary Teachers Determine Grades

Table 5 presents teachers' responses to items asking them about factors they use to determine students' end of semester grades. Overall, the two factors teachers use most extensively in determining students grades across both grades were specific learning objectives mastered (91.5%) and work completed in class (78.7%). In addition, teachers were least likely to determine grades based extensively on improvement from the beginning of the year (17.7%) and work habits and neatness (14.9%). Finally, similar percentages of teachers reported "quite a bit" or "extensive" use of student effort (32.0%), attention in class (25.5%), and homework (21.3%) when determining teacher grades.

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Table 5

Percentage of Teachers Identifying Use of Specific Practices to Determine Students' Grades^a

<i>Factors</i>	<i>Grade 4 (n = 25)</i>	<i>Grade 5 (n=23)</i>	<i>Both (n=48)</i>
Specific learning objectives mastered (SOLs)	95.9	86.9	91.5
Class work	82.6	75.0	78.7
Effort	33.3	30.4	32.0
Attention in class	25.0	26.1	25.5
Inclusion of Zeros for Incomplete Assignments	17.3	26.1	21.7
Homework	20.8	21.7	21.3
Class participation	13.0	26.0	19.6
Improvement from the beginning of the year	8.3	28.5	17.7
Work habits and neatness	8.3	21.7	14.9
Performance compared to other students	0.0	17.3	8.7

Notes: a. Percentage of teachers reporting "quite a bit" and "extensively".

However, there were also differences in what teachers reported using to determine grades depending on the grade level of the class. For example, grade 4 teachers were slightly more likely than grade 5 teachers to use work completed in class extensively (82.6% versus 75.0%, respectively). In addition, a higher percentage of grade 4 than grade 5 teachers reported they used comparisons to other students when determining grades "minimally" or "not at all" (77.2% versus 60.8%, respectively).

While approximately 17.7% of all teachers reported they made use of how much students had improved from the beginning of the year to help determine grades, approximately 2.5 times as many grade 5 teachers (28.5%) reported that they used this practice "quite a bit" or "extensively," compared

to grade 4 teachers (8.3%). Grade 5 teachers were also more likely than grade 4 teachers to determine grades based on extensive use of work habits and neatness (21.7% versus 8.3%) and class participation (26.0% versus 8.3%). Finally, only grade 5 teachers reported “quite a bit” or “extensive” use of comparisons made to other students as a criteria included in their determination of students’ grades.

Types of Assessments Elementary Teachers Use

Unlike the practices teachers used to determine grades, there were no notable differences across grades 4 and 5 in the extent of their use of different types of assessments, therefore, teachers’ responses on these items are presented across grades in Tables 6, 7, and 8. Teachers reported using more traditional objective assessments (89.3%) as well as formative assessments (89.4%), and assessments that measure student application of learning (83.0%) the most extensively. Approximately half of all teachers responded that they made extensive use of assessments that require students to explain their answer (45.7%) and rubrics to evaluate the work of students (47.8%). Practices use to a lesser extent by teachers included performance assessments (28.9%), essays or other constructed response assessments (19.5%), authentic assessments (e.g., “real world” performance tasks) (18.2%), and homework that was graded (i.e., A – F) (17.4%).

Table 6

Percentage of Teachers Identifying "Quite a Bit" or "Extensive" Use of Different Assessment Practices

<i>Type of Assessment Practice</i>	<i>Grades 4 & 5 (n = 48)</i>
Formative assessments	89.4
Objective assessments	89.3
Assessments measuring application of learning	83.0
Assessments that require students to explain their answer	45.7
Use of rubrics to evaluate student work	47.8
Performance assessment	28.9
Authentic assessments (e.g., "real world" performance tasks)	18.2
Homework that was graded (e.g., A-F)	17.4

Teachers were specifically asked about their use of formative assessment practices and how they provide feedback to students. A high percentage of teachers also reported that they engaged in ongoing monitoring of the progress of the class (77.0%). A majority of teachers (72.3%) also reported more extensive use of feedback that contained suggestions for further learning (see Table 7).

Table 7

Percentage of Teachers Identifying "Quite a Bit" or "Extensive" Use of Specific Formative Assessment Practices

<i>Type of Formative Assessment Practice</i>	<i>Grades 4 & 5 (n = 48)</i>
Ongoing, in class monitoring of student progress	77.0
Feedback containing suggestions for further learning	72.3
Feedback (written or verbal) given privately to students	68.1
Assessments used to guide further instruction	65.3
Specific, individualized feedback (written or verbal)	61.7
Assessments to diagnose student weaknesses	40.4

In terms of how feedback was provided to students, 68.1% of teachers responded that feedback given privately to students was used more extensively in their classrooms. With regard to whether teachers provide specific, individualized feedback, a smaller percentage, but still the majority of teachers (61.7%) identified that they did this more extensively for students in their classrooms. A majority of teachers responded that they used assessments to guide further instruction extensively in their classrooms (65.3%); but less than half of all teachers made extensive use assessment as a means of diagnosing student weaknesses (40.4%)

Finally, teachers were asked about their use of assessment practices that offer students opportunities to have input into the assessment process and engage in self-assessment (See table 8).

Table 8

Percentage of Teachers Identifying “Not At All” or “Minimal” Use of Specific Assessment Practices that for Allow Student Input and Opportunities for Self-Assessment

<i>Type of Practice</i>	<i>Grades 4 & 5 (n = 48)</i>
Student choice of assessment or grading criteria	84.4
Grading where students kept a log of their progress and/or grades	54.3
Students review each other’s work	51.1
Student involvement in understanding or developing grading criteria	48.9
Structured class time for self-reflection or self-assessment	46.7

Overall, teachers in grades 4 and 5 reported minimal use of these types of assessment practices. For example, only 84.4% of teachers reported allowing students to have a choice of assessment or grading options “quite a bit” or “extensively”. Approximately half of all teachers reported minimal use of grading where students kept a log of progress and/or grades (54.3%) and one-quarter have students peer review of each other’s work (51.1%), involving students in developing grading criteria (48.9%) and providing students with structured class time for self-reflection or self-assessment (46.7%).

Elementary Teachers’ Goal Orientations

Overall, elementary teachers in the study reported a stronger orientation toward mastery as opposed to performance goals. The mean score on the mastery goal items was 4.21 ($SD = 0.48$), while the mean score on the performance goal items was 3.11 ($SD = 0.74$).

There were some noteworthy differences between grades 4 and 5 teachers on their patterns of responses to the items on each of the scales. From Table 9, a slightly higher percentage of grade 4 than

grade 5 teachers responded that they “agreed” or “strongly agreed” that they “made a special effort to recognize students’ progress even if they are below grade level (100.0% versus 90.9%, respectively). Grade 4 teachers also more strongly agreed that they give a wide range of assignments matched to students’ needs and skill level (83.3%) compared to grade 5 teachers (72.8%). However, grade 5 teachers were more likely to agree with the statements “during class I often provide several different activities so that students can choose among them” (54.6% versus 41.7% in grade 4) and “I tell students mistakes are okay as long as they are learning” (100.0% versus 95.8%).

On the performance scale items, grade 5 teachers were more likely than grade 4 teachers to report that they helped students understand how their performance compares to others (45.4% versus 29.2%), and point out students who do well as models for other students (68.2% versus 60.9%). In addition, while it was a focus of all teachers, grade 5 teachers were more likely to tell students it is important to learn what is being taught because it will be on the SOL test (95.5%), compared to grade 4 teachers (87.5%). In contrast, grade 4 teachers were more likely than grade 5 teachers to display the work of the highest achieving students as examples for others (33.4% versus 23.8%), give special privileges to students who do the best work in class (29.2% versus 22.7%), and point out students who get the highest scores on tests or assignments (29.2% versus 22.7%).

A modest significant positive correlation ($r = .37, p < .05$) was found between the mastery and performance scales. This finding suggests that these teachers hold both types of goal orientations, and that those with stronger mastery orientations are also likely to have stronger performance orientations. It also supports more recent literature suggesting that mastery and performance goals should be viewed as a continuum, rather than a mutually exclusive dichotomy.

Student Engagement, Self-Efficacy, Mastery and Performance Goal Orientations

Scale means and standard deviations for the five student self-report scales can be found in Table 9. For all scales, the possible range is 1 to 5. On average, students reported being relatively engaged in their classes ($M = 4.01, SD = 0.49$), very efficacious ($M = 4.24, SD = 0.58$) and more strongly oriented toward mastery goals ($M = 4.50, SD = 0.53$) than either performance-approach ($M = 3.12, SD = 0.98$) or performance-avoidance goals ($M = 3.30, SD = 1.00$). In general, students' responses were also consistent regardless of grade level. Specific item level responses for each scale can be found in Tables AB– AD; and are addressed in the subsections that follow.

Table 9

Means and Standard Deviations for Student Scales

<i>Scale</i>	<i>Grades 4 & 5 (n = 1036)</i>
Engagement ¹	4.01 (0.49)
Self-Efficacy	4.24 (0.58)
Mastery Goal Orientation	4.50 (0.53)
Performance-Approach Goal Orientation	3.12 (0.98)
Performance-Avoidance Goal Orientation	3.30 (1.00)

Notes: ¹Engagement Scale Response Categories: 1 = Never, 2 = Not Very Often, 3 = Sometimes, 4 = Most of the Time, 5 = Always
 All Other Scales: 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree Nor Disagree, 4 = Agree, 5 = Strongly Agree

Student Engagement

The student engagement scale asked students to respond to items in terms of how frequently they engaged in certain behaviors indicative of effort, persistence, and attentiveness in relation to academic activities. Response categories ranged from “Never” to “Always” (Table 10). In general, students reported high levels of effort and attentiveness in their classes. With a few exceptions, virtually all students (99.6%) reported that they “try hard when I do my classwork”, with the majority of those students selecting “most of the time” or “always” (89.4%). The majority of students also reported that they frequently (responded ‘most of the time’ or ‘always’) “get assignments done on time” (74.0%), and “volunteer to answer questions when [they] know the answer” (76.9%). In contrast, only 10.7% of students responded that their teacher frequently “has to remind me to get going on my work.” Finally, students also reported relatively high levels of persistence in the face of difficulty in that they “keep going over assignments until they understand them,” (70.4%), and rarely “give up when [they] make mistakes,” (3.7%) or “stop trying when the assignment or homework is very difficult,” (7.7%).

The ten items on the student engagement scale were averaged for each student, yielding a student engagement score that was used for in the correlation analyses. The average engagement across fourth and fifth grade students in the sample was 4.01 ($SD = 0.49$) with a Cronbach’s alpha of .65.

Table 10

Percentage of Elementary Students Responding "Sometimes," "Most of the Time," and "Always" on Selected Engagement Scale Items

<i>Scale Item</i>	<i>Sometimes</i>	<i>Most of the Time</i>	<i>Always</i>
I try hard when I do my classwork.	10.2	36.9	52.5
I get my assignments done on time.	21.9	44.9	29.1
I stop trying when the assignment or homework is very difficult.	14.6	4.6	3.1
If I can't understand an assignment at first, I keep going over it until I understand.	22.9	29.1	41.3
I volunteer to answer questions when I know the answer.	17.0	28.7	48.2
My teacher has to remind me to get working on my work.	18.6	5.3	5.4
When I don't understand something, I ask the teacher or my classmate for help.	24.7	22.6	36.7
I give up when I make mistakes.	7.0	1.4	2.3
I would rather do assignments that are challenging than assignments that are really easy.	34.7	18.6	19.5
If I don't know the answer to a question, I try to figure it out on my own.	30.7	34.3	23.7

Self-Efficacy

Items on the self-efficacy scale related to students' beliefs about their likely success and performance in their class. The overwhelming majority of all students in grades 4 and 5 reported that they felt relatively efficacious with regard to their schoolwork (Table 11). Percentages ranged from 76.3% for "I'm certain I can understand the ideas taught in this class" to 91.8% for "I expect to do well

ways" on in this class." Given the overwhelming positive responses, students in these grades appear to have a fairly positive sense that they will be successful in their attempts to learn and be successful in their classes. The average self-efficacy rating reported by fourth and fifth grade students in this sample was 4.24 ($SD = 0.58$). The self-efficacy scale had a Cronbach's alpha of .76.

Mastery Goal Orientation

Of the three scales that are likely to be more related to positive outcomes, students responded most positively to items on the mastery scale, which measured students' focus on the importance of learning for the purpose of mastering and understanding content. Over 85% of all students responded with "Agree" or "Strongly Agree" to each of the five items on this scale. Students appear highly oriented toward learning and improving skills in grades 4 and 5 (Table 11). The overwhelming majority of fourth and fifth grade students reported that they agreed or strongly agreed that they have goals to "learn as much I can" (93.7%) and "improve my skills in this class" (92.5%). The average self-efficacy scale score across the five items for students in the elementary sample was 4.50 ($SD = 0.53$) and the Cronbach's alpha reliability was .74.

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Table 11

Percentage of Elementary Students Responding "Agree" and "Strongly Agree" to Self-Efficacy and Mastery Goal Orientation Items

<i>Scale Items</i>	<i>Students (n = 1036)</i>
<u><i>Self-Efficacy</i></u>	
I expect to do well in this class	91.8
I'm sure I can do an excellent job on the work assigned for this class	85.6
I think I will receive a good grade in this class	85.6
I know that I will be able to learn the material for this class	81.5
I'm certain I can understand the ideas taught in this class.	76.3
<u><i>Mastery Goal Orientation</i></u>	
One of my goals is to learn as much as I can	93.7
It's important to me that I improve my skills in this class.	92.5
It's important to me that I learn a lot in this class.	92.2
One of my goals is to gain a lot of new skills in this class.	87.7
It's important to me that I completely understand my class work.	87.3

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It would appear that for this sample, students at this age place a strong focus on learning for “the value of learning.” However, given the age of the students and the wording of the items, we should be cautious in our interpretation of these results. Children at this age may still be oriented toward pleasing adults; as such there is an increased potential for students to have responded to these (as well as the performance goal items) in ways they believe to be the most socially appropriate.

Performance-Approach and Performance-Avoidance Orientation

The five items on the performance-approach scale and the three items on the performance-avoidance scale measure students’ focus on appearing more competent or avoid appearing less competent to their classmates and teachers, respectively. In general, lower percentages of students responded that they agreed with these statements (Table 12). For the performance-approach items, percentages ranged from 30.8% (“One of my goals is to look smart compared to other students in this class”) to 52.8% (“One of my goals is to show others I’m good at my classwork”). The mean for elementary students on the performance-approach scale was 3.12 ($SD = .98$) with a scale reliability (Cronbach’s alpha of .82.)

For the performance-avoidance items, students were slightly more concerned about not wanting their teachers “to think I know less than other students in the class” (60.9%), and less concerned about “looking confused” (38.9%) or having others “know if [they are] having trouble doing the work” (37.5%). The mean for these items was 3.30 ($SD = 1.00$). However, the reliability for this three-item scale for elementary students was low ($\alpha = .59$), suggesting that as a scale these items do not demonstrate strong enough internal consistency to measure performance-avoidance goal orientations in students of this age. This may in part be due to a combination of a small number of items as well as the wording on items causing confusion to students. Each of these items asked students how strongly

they agreed with statements asking them about how they did not want to be perceived by their peers or teachers (e.g., "It's important I don't look confused in this class"). Fourth- and fifth-grade students may have had difficulty interpreting the meaning of such statements. As a result, the results for these items with the age sample should be interpreted cautiously.

Table 12

Percentage of Elementary Students Responding "Agree" and "Strongly Agree" to Performance-Approach and Performance-Avoidance Items

<i>Scale Items</i>	<i>Students (n = 1036)</i>
<u><i>Performance-Approach</i></u>	
One of my goals is to show others that I'm good at my class work.	52.8
It's important to me that other students in my class think I am good at my class work	46.8
One of my goals is to show others that classwork is easy for me.	39.5
It's important to me that I look smart compared to other students in my class.	31.8
One of my goals is to look smart compared to other students in this class.	30.8
<u><i>Performance-Avoidance</i></u>	
I don't want my teacher to think I know less than other students in the class.	60.9
It is important to me that I don't look confused in this class.	38.9
I don't want anyone in the class to know if I'm having trouble doing the work.	37.5

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Overall, students seem less concerned with how others interpret their performance in class, although this is slightly less true with regard to perceptions of their teachers. Students also make some distinction between “being good at their classwork,” and “appearing smart compared to others;” with the former being more important than the latter. In general, the measures of mastery and performance-approach goal orientations seem to offer more reliable information about elementary students’ motivation in this sample. However, there is a possibility students were influenced by a desire to respond to these items in ways that were most socially appropriate or how they felt their teachers would expect them to respond.

Relationships Among the Student Scales

Table 13 presents the simple correlations among student’ reported engagement, self-efficacy, mastery goals, and performance goals. With the exception of the relationship between the performance-approach and performance-avoidance and engagement scales, all other correlations were significant with $p < .01$. Moderately strong positive correlations were found between self-efficacy and engagement ($r = .512$), and self-efficacy and mastery ($r = .522$). These relationships suggest that students who feel more efficacious and confident of their success in terms of learning are also more likely to be more highly engaged – they report being more attentive, giving more effort, and persisting in the face of difficulty; and have a stronger orientation toward mastering and understanding content. Student engagement was also moderately positively associated with mastery goal orientation. Students who were more engaged also reported being more oriented toward learning for ‘learning’s sake’ than students who were less engaged.

Table 13

Correlations Among Student Engagement, Self-Efficacy, Mastery and Performance Scales

<i>Scales</i>	<i>Engage</i>	<i>Self-Efficacy</i>	<i>Mastery</i>	<i>Perf. Approach</i>	<i>Perf. Avoid</i>
<i>Engagement</i>	1.00				
<i>Self-Efficacy</i>	.512**	1.00			
<i>Mastery</i>	.389**	.522**	1.00		
<i>Performance – Approach</i>	.036	.211**	.194**	1.00	
<i>Performance – Avoid</i>	-.034	.107**	.121**	.508**	1.00

** $p < .01$

Not surprisingly, performance-approach and performance-avoidance goals were also moderately positively correlated ($r = .508$). Students who expressed being more focused on appearing competent or smart to others, were also more likely to focus on not appearing “confused” or as if they “know less” than others. Performance-approach and performance-avoidance goals were not significantly related to student engagement, but they were positively related to students’ report self-efficacy and mastery goals. Although the magnitude of the correlations was generally small ($r = .107$ to $r = .211$), the correlations between the performance-approach scale and self-efficacy ($r = .211$) and mastery ($r = .194$) were stronger than the relationships the performance-avoidance scale and self-efficacy ($r = .107$) or mastery ($r = .121$). In general, students who report being more concerned with completing academic tasks for the purposes of looking smart or avoiding looking confused are

somewhat more likely to report feeling efficacious and having a focus on learning to master content than students who have less of a performance-goal orientation. However, having a stronger performance-goal orientation is not associated with students being more attentive, exhibiting more effort, or being more persistent.

Conclusion

Students in grades 4 and 5 generally report a relatively high sense of efficacy, a greater tendency to focus on academic tasks for the purpose of mastering content, and suggest they are generally engaged in their classes. In addition, students also express less of a performance-goal orientation, regardless if the focus is to appear competent or avoid appearing as if they are “having difficulty.” It is not surprising that students more oriented toward learning are also more engaged and feel more efficacious. It is somewhat surprising that students who have a stronger performance-goal orientation also tend to feel more efficacious and also have an orientation toward learning; although this is not completely contradictory to recent research. In particular, it suggests some tentative support that mastery and performance goals are not mutually exclusive or dichotomous as they were originally conceptualized, but may in fact function along a continuum allowing students to hold both orientations simultaneously.

Students' Perceptions of Their Teachers' Goal Orientations and Their Relationships to Student Engagement, Self-Efficacy and Motivation

We asked students about their teachers' goal orientations to examine whether there were similarities between teachers' self-reports and students' perceptions of their teachers' focus on mastery and performance goals. Students were asked to indicate their level of agreement with statements that paralleled the teacher self report items. For example, instead of “I tell students mistakes are okay as long as they are learning,” students responded to “My teacher tells us mistakes are okay as long as we

are learning.” Because all students within each class were asked about their perceptions of their teachers, we created a class perception for each teacher on the two scales by averaging the responses of all students within a class on each item. Table 14 reports the means and standard deviations for the two scales that measured students’ perceptions of their teachers’ mastery and performance goal orientations.

Table 14

Scale Means and Standard Deviations for Students’ Perceptions of their Teachers’ Mastery and Performance Goal Orientations

<i>Scale</i>	<i>Grades 4 & 5 (n = 1036)</i>
Student Perceptions of Teacher Mastery Goal Orientation	4.10 (0.64)
Students’ Perceptions of Teacher Performance Goal Orientation	3.12 (0.78)

Students perceived their teachers to be slightly more strongly oriented toward mastery goals ($M = 4.10$, $SD = 0.64$) compared with performance goals ($M = 3.12$, $SD = 0.78$). Overall, students’ perceptions were very similar to teachers’ self-reports of their goal orientations – teachers’ self reports were $M = 4.21$ and 3.11 for mastery and performance goals respectively.

Students’ perceptions of their teachers’ goal orientations were significantly positively correlated with students’ reported engagement, self-efficacy and their own mastery and performance goal orientations (see Table 15). The strongest correlations were between students’ perceptions of their teachers’ performance goal orientation and students’ reported performance-approach goal orientation ($r = .381$, $p < .01$); and students’ perceptions of their teachers’ mastery goal orientation and

students' reports of self-efficacy ($r = .369, p < .01$) and their own mastery goal orientation ($r = .336, p < .01$).

Table 15

Correlations of Students' Perceptions of their Teachers' Goal Orientations with Engagement, Self-Efficacy, Mastery and Performance Scales

<i>Scales</i>	<i>Perceptions of Teachers' Mastery Orientation</i>	<i>Perceptions of Teachers' Performance Orientation</i>
<i>Engagement</i>	.274**	-.026
<i>Self- Efficacy</i>	.369**	.114**
<i>Mastery</i>	.336**	.096**
<i>Performance – Approach</i>	.174**	.381**
<i>Performance – Avoid</i>	.035	.228**

** $p < .01$

Students who perceived their teachers to be focused more strongly on performance goals were more likely to report that their focus when completing tasks in the classroom was to appear competent or smart to their teacher and/or classmates. In comparison, students who perceived their teachers to have a stronger focus on mastery goals in the classroom tended to report feeling more efficacious and having a stronger orientation toward completing academic tasks for the purpose of learning. Interestingly, students' perceptions of their teachers' mastery orientation was not significantly correlated with students' reported performance-avoidance goal orientation, while students' perceptions of teachers' performance orientation was not correlated with their self-reported engagement in academic tasks.

In general, students' perceptions of teachers' goal orientations were more strongly correlated with self-reported goal orientations of the same type (e.g., mastery with mastery, performance with performance). It should not be surprising that students who are in classrooms where they perceive teachers to send stronger messages about working on academic tasks, because it is important to understand and learn material regardless of whether mistakes are made, are more likely to have a stronger orientation toward focusing on the importance of participating in academic activities for learning. Similarly, students who are in classrooms where they perceive teachers to send strong messages about performance on high-stakes tests and where comparisons to others are routinely made are more likely to develop an orientation toward academic activities that includes a preoccupation with doing well on tasks in order to appear smarter or avoid looking less competent than their peers. Finally, promoting performance goals (either consciously or unconsciously) appears less likely to positively affect students' engagement, self-efficacy and development of a mastery orientation than promoting mastery goals.

Relationships of Teacher Grading Practices with Student Engagement, Self-Efficacy, and Motivation

One of our primary interests was to examine how teachers' grading and assessment practices were related to student engagement, self-efficacy, and motivation. In order to do this we aggregated students' individual scores on the engagement, self-efficacy and goal orientation scales to create class averages for each variable. We then correlated teachers' grading and assessment practices with these class averages. Given the small teacher sample at the elementary level, a subset of teacher practices was selected such that they represented a range across more traditional, formative and student centered practices. Results of these analyses are presented in Table 16.

Table 16

Correlations of Student Engagement, Self-Efficacy, Mastery, and Performance-Approach Scales with Selected Assessment Practices

<i>Assessment Practice</i>	<i>Engage</i>	<i>Self-Efficacy</i>	<i>Mastery</i>	<i>Perf. Approach</i>	<i>Perf. Avoid</i>
Objective Assessments	.081	.022	.244	.259	.207
Assessments that measure student application of what they have learned	.045	.199	.291*	.187	.010
Feedback that contained suggestions for further learning	.003	.130	.313*	.309*	.341*
Student choice of assessment or grading options	.218	.217	.398**	.041	-.067
Assessments encouraging students to explore content on their own	.216	.240	.367*	.220	.123
Assessments promoting active engagement	.207	.411**	.392**	.143	-.077

* $p < .05$ ** $p < .01$

In general, the selected teachers' grading and assessment practices demonstrated the greatest number of significant correlations with students' mastery goals. Of the six practices presented in the table, only "objective assessments" was not significantly correlated with mastery goal orientation. All of the five remaining practices were positively correlated with students' mastery goal orientation – students were more likely to report having a stronger mastery goal orientation in classes where these practices were used more frequently by teachers. The strongest correlations were moderate in magnitude and were found for "student choice of assessment or grading options" ($r = .398, p < .01$), "assessments promoting active engagement" ($r = .392, p < .010$), and "assessments encouraging

students to explore content on their own" ($r = .367, p < .05$). "Feedback that contained suggestions for further learning" ($r = .313, p < .05$) and "assessments that measure student application of what they have learned" ($r = .291, p < .05$) were slightly smaller in magnitude. Practices that offer students options and require more active participation for completion, as well as those encouraging students to be more self-directed appear to be associated with students' having a stronger orientation toward engaging in tasks with learning as their focus.

Surprisingly, none of the grading and assessment practices were significantly correlated with student average engagement. This is particularly interesting given practices such as providing choices on assessment or grading options, encouraging students to independently explore content, and those designed to promote active engagement, which we would expect from the literature might encourage students to be more active in the learning process. However, these were also practices elementary teachers reported using less frequently.

In terms of self-efficacy, the item "assessments promoting active engagement" was significantly moderately correlated with students' reports of how confident they were about their likely success in the class ($r = .411, p < .01$). Not surprising, students' appear more likely to report higher levels of self-efficacy in classes where teachers make more frequent use of this type of practice. However, none of the other practices were significantly correlated with self-efficacy. For these students in these classrooms, the frequency with which teachers engage in these practices does not appear to be associated with their sense of efficacy.

Finally, with regard to students' performance goal orientations, only one of the selected teacher practices was significantly correlated with students' reports that they engage in academic tasks in order to appear more competent (performance-approach) or avoid appearing less competent (performance-avoidance) to peers and their teachers. The practice of providing "feedback that contained suggestions

r for further learning” was significantly positively correlate with both performance-approach ($r = .309, p < .05$) and performance-avoidance ($r = .341, p < .05$) goals. It is interesting that students who are more concerned with completing academic tasks because it relates to how competent they are perceived to be by others tend to have teachers who report providing this type of feedback more frequently. Further, it is interesting that this practice was more strongly correlated with the performance-avoidance scale than the mastery goal orientation scale. From previous research, we might expect that giving students this type of feedback would be more likely to be related to students developing stronger orientations toward learning goals. It may be that the specific feedback or suggestions are presented by teachers in such a way that how students interpret it sends the message that improving is really more about performing better than learning better. However, we would need additional information regarding specific content of the feedback provided.

Secondary Results

Teacher Survey Results

ly Initial analyses suggest that secondary teachers’ reported classroom and assessment grading practices are fairly similar across grade levels with the exception of a few areas. With regard to different purposes for assessment, the vast majority of middle (76%) and high school teachers (75%) reported they their assessments are geared toward reasoning, and are used to measure how well students can apply what they have learned. Smaller percentages (55%) reported they used assessments that promote active student engagement or measure deep understanding of class material (44%). Less than one-third of middle and high school teachers indicated that they used assessments to diagnose students’ strengths and weakness – although this practice was more prevalent at the middle school (29%) compared to the high school level (17%).

In addition to asking teachers about the purposes for which they use assessment, the teacher survey contained items about the different types and formats of classroom assessments. As shown in Table 17, a sizable majority reported using objective assessments “quite a bit” or “extensively”. Alternatively, a smaller percentage indicated using constructed response items, performance or authentic assessments as frequently. With regard to specific characteristics and the format of assessments, a sizable percentage of teachers at the middle and high school levels indicated using assessments of moderate difficulty as well as tests that included a combination of different item types – objective and short answer, for example. High school teachers were more likely to use assessments of varied item formats as well as to assess teams of students (i.e. group work) than were those in middle schools (61% v. 53%).

Table 17

Types of Assessments Used by Secondary Teachers¹

Types of Assessments	Secondary (<i>n</i> = 161)	Middle (<i>n</i> = 75)	High (<i>n</i> = 86)
Objective tests	66.7%	69.3%	64.3%
Essay-type or other constructed response items	28.5%	28.4%	28.6%
Performance assessments	30.6%	37.9%	24.1%
Authentic assessments	14.2%	13.9%	14.6%
Group/Team	12.6%	9.5%	15.5%
Moderate difficulty	70.5%	66.7%	73.8%
Mixed format	57.0%	52.7%	60.7%

1. Percent reporting “quite a bit” and “extensively”.

The teacher survey also included questions about formative types of assessment practices, or assessments that may be used to guide instructional practice and inform student learning. In general, formative assessment is an approach to measuring student performance with specific emphasis on

informing student learning and instructional decision-making by using assessment to make the learning process transparent. Formative assessment identifies gaps between the current state of learning and the desired learning outcome (Sadler, 1989). Consequently, formative assessment should be accompanied by specific feedback that communicates how students can improve their performance. As shown in Table 18, the majority of middle and high school teachers reported using formative assessments. Since this type of assessment can be used to identify disparities between current levels of student learning and the intended outcome or objective, effective use of these practices requires that students are provided with specific feedback to guide and inform needed changes in their performance. At the scale level, results of a one-way analysis of variance (ANOVA) indicated that there were no statistical differences between the use of formative assessment practices among middle and high school teachers ($F=.546, p = .461$).

A majority of secondary teachers indicated that they consistently monitor student progress as well as provide specific individualized feedback. A slightly smaller percentage reported that this type of feedback was accompanied by suggestions for further learning (41%). Generally, middle and high school teachers indicated similar uses of formative assessment practices. However, middle school practitioners were more likely to report using assessments to diagnose student weaknesses (40% v. 20%) and guide their own instructional practice compared to their high school counterparts (37% v. 27%). Few teachers at the secondary level indicated that they devoted class time to provide students opportunities to reflect on their own work (10% on average).

Table 18

Secondary Teachers' Formative Assessment Practices¹

Practices	Secondary (<i>n</i> = 161)	Middle (<i>n</i> = 75)	High (<i>n</i> = 86)
Ongoing, in class monitoring of student progress	64.4%	52.8%	62.6%
Use of formative assessments	59.0%	58.1%	59.7%
Provide specific individualized feedback	49.7%	48.0%	51.2%
Provide feedback on performance that was given privately to each student	45.9%	42.7%	47.0%
Provide feedback that contained suggestions for further learning	40.8%	38.6%	42.9%
Use of assessments to guide further instruction	31.4%	36.5%	26.8%
Use of assessments to diagnose student weaknesses (e.g. pretest; diagnostic assessment or questions)	24.4%	39.7%	19.5%
Provide structured class time for student reflection or self-assessment	10.2%	14.9%	6.0%

1. Percent reporting "quite a bit" and "extensively".

Both scale and item-level analyses suggest that middle and high school teachers generally use formative assessment practices in similar ways. More refined analyses suggest that there were significant differences at the scale level according to subject area taught for high school teachers (*n* = 86). Results of a one-way ANOVA indicate that high school English teachers were significantly more likely to report the use of formative assessment practices than were their counterparts in history, mathematics, and science ($F = 3.879, p = .007$). There were no differences in the use of formative assessment practices by subject area at the middle school level.

Additional chi-square analyses conducted at the item-level highlight the specific area in which high school English teachers differ from teachers of other subjects. As shown in Table 19, the use of feedback is the primary difference. English teachers reported in significantly larger percentages that they provided specific individualized feedback and provided feedback privately to students on their performance. In both cases the feedback could be provided in either written or verbal forms. Although the majority of teachers in each of the four subjects reported using formative assessment practices either quite a bit or extensively; noticeably smaller percentages especially in mathematics and science reported providing feedback at similar levels. Generally, the results suggest that both English and history/social science teachers are predisposed to using formative assessment strategies or perhaps some subject areas are more amenable to the use of these practices than are others.

Table 19

High School Teachers' Formative Assessment Practices by Subject Area^{1,2}

Practices	English (n=18)	History/Social Science (n=18)	Mathematics (n=19)	Science (n=17)
Ongoing, in class monitoring of student progress	60.0%	55.5%	52.6%	64.7%
Use of formative assessments	73.3%	58.8%	63.2%	64.7%
Provide specific individualized feedback	93.8%*	38.9%	42.1%	47.0%
Provide feedback on performance that was given privately to each student	93.8%*	66.6%	26.4%	47.1%
Provide feedback that contained suggestions for further learning	82.3%	33.3%	27.8%	29.4%
Use of assessments to guide further instruction	35.7%	22.3%	26.3%	17.7%
Use of assessments to diagnose student weaknesses (e.g. pretest; diagnostic assessment or questions)	25.1%	11.1%	21.1%	5.9%
Provide structured class time for student reflection or self-assessment	6.3%	5.6%	5.3%	0.0%

1. Percent reporting "quite a bit" and "extensively".

2. Of the 86 high school teachers, 14 reported teaching classes "other" than English, History/Social Science, Mathematics, or Science. Classes characterized as "other" included elective courses such as economics and psychology for example. The results for these teachers are not reported above.

* Chi-square analyses indicate that item level differences across subject areas are significantly different at $p < .0001$.

The procedures middle and high school teachers reported using during the scoring and grading process were similar. As shown in Table 20, the majority of both middle and high school teachers indicated using grading procedures that regularly informed students of their progress in class (67% and 57% respectively). However, the results suggest that middle school teachers were likely to adopt a more structured approach to keeping students abreast of their performance compared to high school practitioners. Roughly, one-third of middle school educators reported using a grading or tracking system, in which students kept a formal log of their grades, compared to 20 percent of high school

teachers. At the same time results suggest greater flexibility on the part of middle school teachers – they were twice as likely to report, albeit in small percentages, than high school teachers to provide students with a choice of assessment options (11% v. 2%).

The approach to grading homework was similar among secondary teachers. A sizable percentage (46%) indicated that they graded homework on the basis of completion rather than using a numerical or letter score to assess homework exercises (33%). The use of rubrics compared to checklists was also more fairly common amongst secondary teachers – roughly one-third to one-fourth of teachers reported using these types of scoring guides respectively. However, middle school teachers were more likely to report using a formal scoring guide compared to their high school counterparts. Small percentages, less than 15%, of middle and high school educators reported using scoring criteria at the outset of an instructional unit or involving students in the process of developing the criteria that will be used to grade their work.

Table 20

Secondary Teachers' Scoring and Grading Procedures¹

Procedures	Secondary (n= 161)	Middle (n = 75)	High (n=86)
Grading that constantly shows students how well they were doing in class	61.7%	66.7%	57.3%
Grade homework "completed"/"not completed"	46.2%	46.0%	46.4%
Grade homework using a letter or score range (i.e. A-F)	32.7%	34.3%	31.4%
Rubrics to evaluate student work (i.e. scoring guide using criteria to differentiate levels of student performance).	30.4%	36.5%	25.0%
Grading/tracking in which students keep a log of progress and/or grades	24.4%	29.7%	19.5%
Involve students in developing and/or understanding criteria used for grading	14.0%	14.9%	13.2%
Checklists to evaluate student work	12.1%	13.3%	10.9%
Use of scoring criteria at the beginning of an instructional lesson.	12.5%	14.3%	11.0%
Provide students with choice of assessment options	6.3%	10.9%	2.4%

1. Percent reporting "quite a bit" and "extensively".

Greater differences in middle and high school teachers' practices are evident in the factors that contribute to student grades. As shown in Table 21, secondary teachers use a variety of information when arriving at student grades. The vast majority of both middle and high school teachers reported that the extent to which students achieved learning objectives was the main factor on which grades were based. Similarly, work completed in class was also a significant contributor to student grades. A large percentage of teachers in both groups reported using zeros in the calculation of grades when accounting for incomplete work or missing assignments (63%). Middle school teachers reported that

they based grades on effort and attention in class compared to high school teachers. However, those at the high school level were significantly more likely to consider student improvement and provide extra credit than were those at the middle school grades.

Table 21.

Factors Secondary Teachers' Use to Determine Student Grades¹

Factors	Secondary (n= 161)	Middle (n = 75)	High (n=86)
Learning objectives	78.2%	81.3%	75.3%
Class work	67.5%	73.3%	65.9%
Use of zeros for incomplete work	62.5%	60.8%	63.9%
Homework	35.7%	38.7%	33.0%
Attention in class	23.1%	29.8%	17.0%
Effort	25.5%	28.3%	21.9%
Class participation	15.1%	12.0%	17.9%
Work habits	9.6%	10.7%	8.5%
Extra credit	9.6%	5.5%	13.1%
Improvement	6.3%	1.4%	10.7%

1. Percent reporting "quite a bit" and "extensively".

Student Survey Results

This section reports on the results of the middle and high school student survey. The presentation of the student survey results are organized first by reporting on the scale level results and then highlighting significant differences among middle and high school students at the item level. The survey was constructed to measure different aspects of student motivation including goal orientation, efficacy and persistence. As described previously, several scales emerged from a factor analysis of student survey results – performance goal orientation; mastery goal orientation, efficacy, and

persistence. Table 22 demonstrates the relationship among the four student subscales. Correlations revealed modest, yet significant relationships, among goal orientation/motivation, efficacy and persistence scales.

Table 22

Correlations between Student Subscales at the Secondary Level

	Performance	Mastery	Efficacy	Persistence
Performance Subscale	1			
Mastery Subscale	.44**	1		
Efficacy Subscale	.36**	.48*	1	
Persistence Subscale	.18*	.38**	.45**	1

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

A series of one-way ANOVA's were conducted to determine if student perceptions differed statistically by grade level. As shown in Table 23, middle school students reported significantly higher means on the scales compared to their high school counterparts. Higher mean values indicate higher levels of the construct. Mean differences indicate students in the middle school grades were significantly more likely to report having both performance and mastery goal orientations; a greater level of self-efficacy; and were more likely to persist when faced with challenging activities.

Table 23

Student Scale ANOVA Results by Grade Level

Grade Level	Performance Goal Orientation		Mastery Goal Orientation		Efficacy		Persistence	
	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>
Middle	3.07 (.22)	.000	4.21 (.24)	.000	4.16 (.20)	.001	3.68 (.23)	.000
High	2.90 (.28)		4.04 (.24)		4.04 (.25)		3.48 (.19)	

As suggested by the significant mean differences at the scale level, item-level results of middle and high school students also varied. Table 24 presents results for items comprising the performance goal orientation scale. As shown, students at the middle school level indicated in consistently larger percentages that they subscribed to a performance goal orientation or were more likely to be motivated by external compared to intrinsic (e.g. mastery) factors. A majority of both middle and high school students were concerned about teacher perceptions; sixty-one compared to fifty-five percent, respectively, reported that they didn't "want [their] teacher to think [they] know less than other students in the class." By comparison, less than a majority of both middle and high school students reported similar concerns about peer perceptions. In general, however, compared to high school students, those in the middle grades indicated in significantly larger percentages that they were motivated in order to promote or maintain positive perceptions among their classmates and peer group. For example, middle school students were more likely than those in high school to indicate that it was important "to show others that they were good at their class work" as well as they didn't want their classmates or peers to know if they were struggling with class work or assignments.

Table 24

Secondary Students Performance Goal Orientation Results¹

Survey Items	Secondary (n= 3,242)	Middle (n = 1,764)	High (n=1,478)
I don't want my teacher to think I know less than other students in class.	58.3%	61.1%*	54.8%
One of my goals is to show others that I'm good at my class work.	35.6%	41.6%*	28.6%
It's important to me that other students in my class think I am good at my class work.	35.2%	38.1%*	31.9%
It's important to me that I don't look confused in this class.	32.7%	35.5%*	29.4%
One of my goals is to show others that class work is easy for me.	28.1%	32.4%*	22.9%
I don't want anyone in the class to know if I'm having trouble doing the work.	21.1%	24.1%*	17.6%
It's important to me that I look smart compared to other students in my class.	20.9%	19.4%*	15.9%
One of my goals is to look smart compared to other students in this class.	17.8%	23.0%*	18.3%

1. Percent reporting "agree" and "strongly agree".

* Chi-square analyses indicate that middle and high school item level differences are significantly different at $p < .0001$.

Students were also asked to respond to questions related to a mastery goal orientation or motivation based on an intrinsic value of the learning process. These results are reported in Table 25. Although, the vast majority of both middle and high school students reported having goals related to learning new knowledge and skills; those at the middle school level reported general agreement to the items in significantly larger percentages. As suggested, by the item-level results, middle school

students were more likely to report that it was important to thoroughly understand their class work, improve skills, and learn as much as possible to compared to those at the high school level.

Table 25

Secondary Student's Mastery Goal Orientation Results¹

Survey Items	Secondary (n= 3,242)	Middle (n = 1,764)	High (n=1,478)
It's important to me that I completely understand my class work.	85.9%	86.1%*	85.6%
It's important to me that I improve my skills in this class.	81.3%	82.6%*	79.9%
One of my goals is to learn as much as I can in this class.	78.9%	80.6%*	75.6%
It's important to me that I learn a lot in this class.	78.8%	81.6%*	75.7%

1. Percent reporting "agree" and "strongly agree".

* Chi-square analyses indicate that middle and high school item level differences are significantly different at $p < .0001$.

The results for the survey items that comprised the self-efficacy scale are shown in Table 26. As shown, large percentages of middle and high school students reported having a strong sense of self-efficacy. An overwhelming majority in both groups reported that they expected to do well in class, that they will be able to learn the course content, expect to earn a good grade and will be able to understand the ideas that are taught. Generally, middle school students indicated agreement to the items in significantly larger percentages; however high school students reported with greater confidence that they could understand the ideas taught in the class than did their middle school counterparts (78% compared to 75% respectively). Regardless, the results soundly demonstrate that both groups of students reported in sizable numbers feeling a strong sense of self-efficacy toward their capacity to learn and be successful academically.

Table 26

Secondary Students' Self-Efficacy Results¹

Survey Items	Secondary (n= 3,242)	Middle (n = 1,764)	High (n=1,478)
I expect to do well in this class.	88.0%	89.9%*	85.6%
I know that I will be able to learn the material for this class.	82.9%	84.0%*	81.5%
I think that I will receive a good grade in this class.	81.1%	85.4%*	76.1%
I'm sure I can do an excellent job on the work in this class.	79.1%	81.7%*	76.0%
I am certain that I can understand the ideas taught in this class.	76.4%	75.2%	77.8%*

1. Percent reporting "agree" and "strongly agree".

* Chi-square analyses indicate that middle and high school item level differences are significantly different at $p < .0001$.

Compared to perceptions of self-efficacy, students generally reported lower levels of persistence. As shown in Table 27, the majority of middle and high school students reported that they persevered when faced with challenging or difficult assignments rather than electing to give up on the specific task. Compared to high school students, those in the middle grades reported in significantly larger percentages that they engaged in activities that enabled them to persist. For example, middle school students reported with greater frequency that if they didn't know an answer they would try to figure it out independently (53% v. 45% respectively). Further, middle school students reported in significantly larger percentages than those at the high school level (62% v. 53%), that if they didn't understand an assignment they would continue to review the work until they comprehended the task. Small percentages of both groups indicated that when faced with difficult assignments or obstacles, such as making mistakes, they gave up and disengaged from the task. However, high school students reported in significantly larger percentages, albeit small, that they were more likely to "stop trying when the assignment or homework is very difficult."

Table 27

Secondary Students Persistence Results¹

Survey Items	Secondary (n= 3,242)	Middle (n = 1,764)	High (n=1,478)
If I can't understand an assignment at first, I keep going over it until I understand it.	58.2%	62.4%*	53.2%
If I don't know the answer to a question, I try to figure it out on my own.	49.1%	52.8%*	44.7%
I would rather do assignments that are challenging than assignments that are really easy.	22.5%	24.8%*	19.8%
I stop trying when the assignment or homework is very difficult.	9.4%	7.9%	11.2%*
I give up when I make mistakes.	3.2%	3.5%*	2.6%

1. Percent reporting "always" and "most of the time".

* Chi-square analyses indicate that middle and high school item level differences are significantly different at $p < .0001$.

Generally, the pattern of responses among middle and high school students is consistent. However, middle school students typically reported in significantly larger percentages having a greater inclination toward both performance and mastery goal orientations, regarded themselves as having a stronger sense of self-efficacy as well as greater levels of persistence. Even though the analyses indicate that there are statistically significant differences at both the scale- and item-levels, these probabilistic variations may not, in many cases, translate into practical distinctions.

Teachers' Grading Practices and Student Motivation

Correlations were used to identify relationships between teachers' reported assessment and grading practices and student perceptions of motivation (e.g. performance or mastery goal orientation), self-efficacy, and persistence. There were a number of teacher grading practices at the secondary level that showed modest yet significant correlations with the student efficacy scale, including the use of the degree to which students pay attention in class as well as work completed in class when calculating semester grades (see Table 28). Similarly, grading practices associated with a performance goal orientation included basing grades in part on class participation; whereas using homework as part of grade calculations was associated with a mastery goal orientation.

Table 28

Correlations between Secondary Teachers' Grading Practices and Student Subscales

Grading Criteria	Performance	Mastery	Efficacy	Persistence
Class participation	.17*	.12	.16	.05
Work habits and neatness	.15	.11	.12	.20*
The degree to which students pay attention in class	.13	.10	.23**	.12
Homework	.03	.20*	.01	.05
Work completed in class	.13	.15	.30**	.01

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

Table 29 shows the correlations between secondary teachers' assessment practices and the four student subscales. As shown, modest yet significant correlations were evident across the various assessment strategies. Several practices are positively correlated with a mastery orientation including, providing students with opportunities to retake tests and grading homework by assigning a letter grade

or point value. In addition, using assessments to diagnose student weaknesses and assessments that are not graded – which allow for students and teachers to assess current levels of performance were also associated with a mastery orientation. Further, using strategies that increase the transparency between the instructional and assessment process, such as using rubrics, providing students with scoring criteria at the outset of an instructional lesson or unit, and providing structured opportunities for self-reflection and/or assessment were positively associated with a mastery goal orientation. Alternatively, only the use of class time to provide students with opportunities for peer review was significantly associated with performance goals. Some of the practices associated with mastery goals were also positively correlated with student persistence; for example, the use of rubrics and assessments that were not graded. Assessments that placed greater cognitive demands on students are associated with persistence; such as the use of assessments that measure deep understanding as well as those that require students to explore ideas on their own.

Table 29

Correlations between Secondary Teachers' Assessment Practices and Student Subscales

Use of:	Performance	Mastery	Efficacy	Persistence
Formative assessment practices	-.06	.12	.17*	.05
Opportunities for retakes of tests	.16	.22*	.09	.04
Assessments that measure deep understanding	-.08	.09	.13	.30**
Assessments that require students to explore ideas on their own	.09	.05	.11	.17*
Assessments to diagnose student weaknesses	.11	.19*	.17	.08
Rubrics to evaluate student work	.01	.17*	.11	.29**
Assessments that are not graded	.17	.18*	.13	.19*
Scoring criteria at the beginning of an instructional lesson or unit	.13	.18*	.01	.06
Performance assessments	.09	.13	.21*	.16
Opportunities for students to peer review each other's work	.21*	.17	.18*	.17
Structured class time for student self-reflection or assessment	.16	.19*	.10	.00
Homework graded on a letter scale or point scale	.13	.22*	.02	.04

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

When the survey results were disaggregated by grade level, many of the significant correlations at the secondary level disappeared among middle school teacher and student survey data. This may be due in part to the decrease in the sample size from an N=137 (total number of secondary teachers with matched classroom level data) to an N = 66. As shown in Table 30, including homework in the semester grade calculation; using assessments that are not graded, developing tests with different types of questions and formats, and grading homework on the basis of a letter grade or point system

were positively associated with a mastery goal orientation. In addition, the use of assessments designed to measure students' deep understanding of course content and concepts, using rubrics to evaluate student work as well as assessments that are not graded were positively correlated with student persistence. Alternatively, the use of assessments that measure deep understanding as well as assessments that require students to explain their answers were practices that were significantly negatively correlated with a performance orientation. When one considers that a performance goal orientation is posited around the use of external, often comparative factors, such as measuring one's performance against others as a source of motivation, the negative direction of the correlations is not surprising. However, these same practices were not significantly correlated with a mastery goal orientation.

Table 30. Correlations between *Middle School Teachers' Grading and Assessment Practices* and Student Subscales

	Performance	Mastery	Efficacy	Persistence
Grades based in part on <i>homework</i>	-.03	.32**	.07	.01
Using assessments that measure deep understanding	-.27*	-.08	.12	.24*
Administering tests and other assessments of moderate difficulty	-.19	.24	.32*	.12
Using rubrics to evaluate student work	-.23	.11	-.08	.29*
Using assessments that are not graded	.17	.18*	.13	.19*
Using assessments that require students to explain their answer	-.34**	-.05	.03	.12
Grading homework using a letter grade or point range	.10	.27*	-.06	.04
Using different types of test questions and formats	-.04	.26*	-.07	.17

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

Tables 31 and 32 show the correlations among the grading and assessment practices of high school practitioners (N=71) and the student subscales. The use of factors such as improvement in performance, effort, homework, and the extent to which students pay attention in class when determining semester grades were positively correlated with a mastery goal orientation. Similarly, grading criteria which included class participation, improvement, effort, paying attention as well as class work were associated with greater levels of self-efficacy among high school students. These results suggest that some factors or criteria used to determine grades may enhance student levels of self-efficacy as well as promote a mastery orientation toward learning. However, using factors that are

difficult to systematically and directly measure across all students such as effort and paying attention is generally not recommended as a sound grading practice.

Table 31. Correlations between *High School* Teachers' Grading Practices and Student Subscales

Grading Criteria	Performance	Mastery	Efficacy	Persistence
Class participation	.17	.16	.34**	.00
Improvement in performance	.17	.31**	.31**	.21
Effort	.25*	.27*	.32**	.06
Homework	.03	.20*	.01	.05
Degree to which students pay attention in class	.21	.26*	.39**	.14
Work completed in class	.18	.23	.49**	.04

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

At the high school level an analysis of the relationship between teachers' assessment practices revealed the use of certain methods that are associated with higher levels of self-efficacy and persistence (see Table 32). The implementation of assessments that promote active student engagement, the use of authentic and performance assessments, as well as providing opportunities for peer review of work are examples of practices that were associated with higher levels of self-efficacy. In addition the results suggest assessments that demand more cognitively, such as those that measure deep understandings, are of moderate difficulty, and require the application of conceptual information or skills are positively correlated with student persistence. These results suggest that challenging activities and assessments are more likely to engage students and keep them interested throughout the assessment or instructional activity. The use of scoring criteria at the beginning of a lesson and giving opportunities for peer review showed a positive relationship with a performance goal orientation. Providing structured class time for student self-reflection and assessment was associated with both

performance and mastery goal orientations. For example, having students compare drafts of their work with the rubric used for scoring as a way to evaluate their current progress and identify revisions, or changes needed for improvement is a formative assessment activity that would work well for students who have either a mastery or performance goal orientation.

Table 32

Correlations between High School Teachers' Assessment Practices and Student Subscales

Use of	Performance	Mastery	Efficacy	Persistence
Assessments that measure deep understanding	-.04	.08	.03	.27*
Tests and other assessments of moderate difficulty	-.18	.00	.02	.29*
Assessments that measure the application of concepts or skills	.09	.09	.17	.24*
Assessments that promote active engagement	.23	.10	.25*	.10
Assessments to diagnose student weaknesses	.21	.30*	.12	.07
Rubrics to evaluate student work	.14	.19	.21	.27*
Using scoring criteria at the beginning of an instructional lesson or unit	.26*	.21	.07	-.02
Use of performance assessments	.21	.08	.25*	.14
Providing opportunities for students to peer review each other's work	.31**	.08	.28*	-.05
Structured class time for student self-reflection and/or assessment	.36**	.27*	.20	-.15
Authentic assessments (i.e. "real world" performance tasks)	.14	.10	.26*	-.10

** Correlation is significant at the .01 level; * Correlation is significant at the .05 level

Secondary teacher and student results were disaggregated by subject area (e.g. English, history/social science, mathematics, and science) to determine if any assessment practices were uniquely associated with a particular subject. Some interesting relationships emerged from this more refined analysis. For example, in English classes providing students with opportunities to earn extra credit was negatively associated with student levels of persistence ($r = .42, p < .05$). In other words, students are less likely to maintain engagement in challenging learning activities if opportunities to earn additional points are available. Practices associated with increased levels of student persistence in history and social science courses included providing students opportunities to re-take tests ($r = .49, p = .01$), using assessments that encourage students to explore ideas independently ($r = .36, p = .05$), organizing structured class time for peer review ($r = .36, p = .05$) student self-reflection and/or self-assessment ($r = .35, p = .05$). In addition, providing students with feedback that contains suggestions for further learning ($r = .38, p = .05$), using assessments that require students to explain their answers ($r = .37, p = .05$), and using assessments to diagnose students' strengths and/or weaknesses ($r = .36, p = .05$) were associated with greater levels of self-efficacy. Interestingly, assessment practices related to increased levels of self-efficacy and persistence were similar for history/social science and mathematics courses with a few minor distinctions. The general use of formative assessment strategies ($r = .38, p = .05$), non-graded assessments ($r = .36, p = .05$), as well as reviewing scoring criteria at the outset of an instructional unit ($r = .39, p = .05$), were notable differences among the practices associated with self-efficacy. Among science teachers, the use of checklists ($r = .50, p = .05$), rubrics ($r = .46, p = .05$), and involving students in the development of scoring guides were practices associated with greater levels of student persistence ($r = .41, p = .05$). In addition, assessing teams or groups ($r = .43, p = .05$), and providing students with choices among different assessment options were positively related to a mastery goal orientation ($r = .62, p = .05$). These results suggest that secondary

teachers may want to consider the use of assessment practices in light of those shown to be effective in particular subject areas. However, a practice that showed up consistently as being associated with self-efficacy and persistence across all subject areas was the providing students with opportunities to self-reflect and/or peer review.

Summary

Secondary teacher and student survey results suggest that certain grading and assessment practices are associated with higher levels of student persistence, efficacy, and motivation. Roughly 75 percent of secondary teachers reported that the most significant factors used to determine grades included the degree to which students have mastered instructional objectives and the work completed in class (70%). However, student survey results suggest that in addition to basing grades on class work, incorporating effort, improvement in performance, paying attention in class, and class participation are associated with higher levels of efficacy and persistence.

Slightly more than half of middle and high school teachers (roughly 60%) reported extensive use of formative assessments or practices that are designed to inform the learning process or instruction. Student survey results indicate that these types of practices can support the learning of students with a mastery goal orientation, such as using assessments that are not graded, providing structured class time for student self-reflection and self-assessment, as well as using assessment for the purpose of diagnosing students' strengths and/or weaknesses.

Objective tests were the most frequent type of assessment used by high school teachers; a small minority (approximately 20%) reported frequent use of performance or authentic assessments. However, assessment practices that measured deep understandings, promote active student engagement, require students to explain their answers or explore content on their own were most associated with a mastery goal orientation among students.

These results suggest that to some extent there is a disconnect between the grading and assessment practices most frequently used by secondary school teachers and those practices that are most relevant to students who are motivated by a desire to learn to develop their own understanding. For example, using assessment practices such as: rubrics and checklists, formative strategies, assessments that require higher-order cognitive skills and basing instruction on assessment information may mitigate some of these differences among teacher practices and student beliefs about what engages and motivates them in the learning process. In addition, providing comments or feedback to students that include specific suggestions for how they can improve their learning and subsequently create in-class opportunities for students to reflect, critique, and review their work may also heighten student levels of efficacy, engagement, and persistence in their own learning process.

Conclusion

The results of the study indicate that teachers' grading and assessment practices are associated with student reported levels of self-efficacy, goal orientation, persistence, and engagement. Both elementary and secondary teachers emphasized how well students mastered the learning objectives and included student completion of work in class in grades. Also, both elementary and secondary teachers indicated they use formative assessment practices to monitor student progress and provide specific, individualized feedback to their students. Middle school practitioners used assessments to diagnose student weakness and guide their own instruction more than teachers at the high school level. Elementary teachers were more likely to use assessments where students were required to explain their answer and used rubrics to evaluate student work which may promote greater motivation. As a result elementary students reported that they perceived their teachers as being more mastery goal oriented than performance goal oriented.

As with secondary level teachers, elementary teachers make extensive use of formative assessment practices to monitor class, provide individual feedback and guide further instruction. However, the specific nature of these practices should be further explored to determine how teachers accomplish “assessments promoting active engagement” for example. In addition, the nature of feedback needs to be further explored, as teacher use of feedback was more strongly correlated with performance-avoidant goals than the performance-approach goals. For middle school students, this performance orientation was reported most often and both middle and high school students were concerned with their teacher’s perception of their ability. External valuation by peers was also important for secondary students; however, it is difficult to determine if this referent pattern is a result of assessment practices or due to the nature of adolescent students.

Also, the results indicate that there are differences between teacher practices by content area. Content area analysis indicated that more English teachers reported that they provide specific, private feedback to students. Mathematics and science teachers reported the least use of feedback, which suggests some subject areas are more amenable to the use of those practices than others. This is an area which should be further explored.

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