How Am I Doing? Exploring On-Line Gradebook Monitoring as a Self-Regulated Learning Practice That Impacts Academic Achievement

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Accessing the on-line gradebook feature of course management systems (e.g., Blackboard) is a novel form of performance monitoring and feedback seeking associated with self-regulated learning practices. In this study I explore on-line gradebook monitoring's connection with student goal orientation and academic achievement. Three additional feedback-seeking strategies also are examined in relation to these variables. Analysis of survey data collected from first semester freshmen business majors indicates on-line gradebook monitoring is the primary form of feedback seeking students use to assess classroom performance and is a significant, positive predictor of final course grades. Both performance-prove and learning goal orientations predicted on-line gradebook monitoring and instructor inquiry strategies. Implications for classroom practice and future research are discussed.

"The millennial generation's leading edge, 24- to 26-year-olds . . . have been socialized since childhood to get constant feedback and are going to look for it in the workplace too . . . . But if everyone can agree on the terms of the feedback, it could be a superb tool for managing performance."
–Ron Alsop, *WSJ*, December 7, 2007

As management educators prepare students for success in rapidly changing work environments, the need for "learning managers" versus "learned managers" has never been greater (Johnson & Spicer, 2006). Learning is critical to sustained performance by individuals and organizations as they adapt to shifting goals and priorities, necessary competencies, and innovative approaches to numerous, varied pursuits. As a consequence, educational institutions increasingly undertake the challenge to incorporate practices and policies that facilitate *lifelong* learning (Mansui & De Corte, 2005), while professional organizations regularly list lifelong learning among their goals (Schloemer & Brenan, 2006). Lifelong learning is synonymous with *self-regulated learning* (SRL), the more common term applied in formal educational settings. The willingness and ability to learn and adapt throughout one's life is seen as fundamental for improving knowledge, skills, and competence (Banker, Field, Schroeder, & Sinha, 1996; Schober, Finsterwald, Wagner, Lüftenegger, Aysner, & Spiel, 2007), and key to both academic and professional success (Boekaerts, 1999).

Self-regulated learners are active participants in the learning process. They establish goals, select and apply strategies, and self-monitor their effectiveness (Zimmerman, 2008). Self-monitoring, a key SRL practice, occurs when students regularly assess their progress in learning and achievement. Seen by some as the most important or comprehensive component of SRL (Mace, Belfiore, & Hutchinson, 2001), self-monitoring is considered the critical delineator between successful and unsuccessful

students (Pressley & Ghatala, 1990). That is, individuals who regularly address the question, "How am I doing?" are more likely to "make appropriate changes that lead to improved learning and performance" (Schloemer & Brenan, 2006: 82).

My primary focus here is an information technology resource that may promote self-monitoring: the on-line gradebook. On-line gradebooks are an increasingly available and utilized component of virtual learning environments and web-based course management systems (CMS) such as Blackboard or WebCT (now Blackboard Vista). In essence, they provide students unimpeded, continuous access to individual and comparison classroom performance assessment information. On-line gradebooks allow instructors to regularly post class assignment grades throughout the semester. In turn, students can easily and privately access their own scores through the Internet to see how they're doing. On-line gradebooks also provide social comparison information. They compute class averages and range of scores for each course assignment posted and automatically post points attained versus points possible cumulatively over the semester. As *outcome* feedback on performance results (Earley, Northcraft, Lee, & Lituchy, 1990), information provided through on-line gradebooks does not tell students *how* they should go about improving their performance (*process* feedback), only that it may be necessary.

To date, no research examines this self-monitoring, feedback-seeking strategy and its potential antecedents and consequences in an achievement environment. My study reported here considers perceptions regarding the pursuit of feedback and examines how trait goal orientation impacts online gradebook monitoring as well as other feedback-seeking strategies students use to monitor progress in their academic pursuits. Further, I examine the impact of on-line gradebook monitoring on student academic performance. Broader implications of this study focus on preparing our management students for success in dynamic work environments. Therefore, it is important to explore how available technologies and performance information combine with self-regulating or monitoring tendencies to promote continuous growth and development in the classroom and beyond.

LITERATURE REVIEW AND HYPOTHESES

Management educators recently were challenged to engage in more "boundary spanning" by introducing educational research concepts into our research (Arbaugh, 2008). Within the field of education, the literature on self-regulated learning re-

flects over 2 decades of research that examines student-controlled strategies for learning and achievement. Definitions and models of self-regulated learning reflect a variety of theoretical frameworks, each emphasizing slightly different features (Boekaerts & Cascallar, 2006; Boerkaerts & Corno, 2005; Ross, Salisbury-Glennon, Guarino, Reed, & Marshall, 2003). In a broad sense, SRL is defined as an active, constructive process by which learners set goals, monitor their learning, and control their cognition, motivation, and behavior, while maintaining awareness of their relevant learning environment (Pintrich, 2000). More specifically, SRL behaviors include asking questions, sharing information, seeking help, experimenting with actions, and pursuing feedback (Singer & Edmondson, 2006). Research on self-regulated learning addresses a constellation of processes that impact individual learning and accomplishment (Belfiore, 1998; Pintrich & De Groot, 1990). SRL practices can predict such outcomes as achievement track placement (Zimmerman & Martinez-Pons, 1986), student grade point average (Van Zile-Tamsen & Livingston, 1999), and overall student academic achievement (Zimmerman, Bandura, & Martinez-Pons, 1992).

Information-seeking strategies increasingly are incorporated into models of and research on self-regulated learning. For example, *help seeking*, often linked with use of learning communities and support personnel, is considered an important learning strategy linked to student achievement goals and academic performance (Karabenick & Newman, 2006; Newman, 2002). A related field of study, *feedback seeking* (Ashford, 1986; Vande-Walle, Ganesan, Challagalla, & Brown, 2000), is not typically linked with self-regulated learning frameworks, but more often tied to organizational studies of performance management (Kluger & De-Nisi, 1996; Larson, 1989). Nevertheless, its relevance to SRL is apparent, as Ashford and Cummings (1983) assert:

> In attempting to survive and prosper in an organization, individuals are frequently very active in the feedback process: actively attending to evaluations from others and directly seeking verbal appraisals of their behavior (370).

The acknowledgement of "learner control" in SRL practices requires attention toward the proactive role students play in facilitating performance outcomes (Ford, Smith, Weissbein, Gully, & Salas, 1998). Feedback-*seeking* research conceptualizes the individual as an active information-processor

who views performance information as a desired resource to answer questions, gain perspective, signal weaknesses, and recognize achievement. Thus, feedback-seeking research examines the practice of performance information acquisition *initiated* by individuals. In this study, feedback seeking serves as the conceptual frame for students actively acquiring performance information as part of self-regulated learning.

Feedback Seeking and On-Line Gradebook Monitoring

Feedback seeking, in general, is an attempt to obtain a greater degree of certainty and control over one's learning environment—in the classroom or at work. *Feedback seeking* is defined as behavior in which individuals actively pursue and acquire relevant information about their performance (Ashford, 1986; Ashford, Blatt, & Vande-Walle, 2003; Ashford & Cummings, 1983; Ashford & Tsui, 1991; Crant, 2000). This behavior is manifested in two primary forms: inquiry and monitoring. *Feedback inquiry* includes directly asking available sources in the work or classroom environment (e.g., managers, teachers, peers) about one's own performance. *Feedback monitoring* involves observing environmental cues (e.g., marked papers, posted rankings/grades, witnessed conversations of students and faculty regarding assignments) to obtain information about one's performance. On-line gradebook monitoring is a novel form of this second category of feedback seeking.

Antecedent to the practices of monitoring (observing environmental cues) and inquiry (directly asking sources) are perceptions regarding the costs and benefits of feedback seeking. In general, individuals are more likely to seek information when perceived costs (i.e., effort in pursuing feedback and ego/impression management risks) are low and the instrumental value (benefits) of feedback is high (Ashford, 1986; Ashford & Cummings, 1985; VandeWalle, 2003; VandeWalle & Cummings, 1997). Monitoring on-line gradebooks, an information technology-based feedback-seeking option, likely reflects similar cost–benefit assessments. For instance, research examining the technology acceptance model (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) confirms that acceptance and utilization of information technologies result from two key beliefs: perceived ease of use and perceived value (Lie, Van Slyke, & Green, 2005). Research also indicates that when feedback seeking is valued, it promotes both inquiry and monitoring behaviors (Ashford, 1986).

More complicated is how perceived costs affect feedback-seeking strategies. Typically, effort and risk with feedback seeking are measured by assessing individual concerns about directly requesting performance feedback from others. Limited research examining the impact of perceived cost on feedback-seeking practices shows it positively related to monitoring, but negatively related to inquiry (Fedor, Rensvold, & Adams, 1992), with impression management fears contributing heavily to these tendencies (Fedor, Mathieson, & Adams, 1990). Impression management concerns are a primary reason many fail to directly elicit performance feedback, especially from authority figures (Morrison & Bies, 1991). Students may fear they appear naïve, unintelligent, or even desperate when directly approaching their instructor regarding their class standing (Ashford, 1989; Ashford & Northcraft, 1992; Schlenker & Pontari, 2000). Students also may be shy, anxious, or simply embarrassed talking to professors, especially if considerable time passed before initiating contact. Others may feel uncomfortable approaching faculty members due to language or cultural differences. It is ironic that many students choose to remain uncertain about specific or overall performance rather than use inquiry, *especially* when they are concerned they may not be doing well (Levy, Albright, Cawley, & Williams, 1995).

Monitoring on-line gradebooks likely reduces the effort involved in obtaining performance feedback and eliminates many impression management risks and personal inhibitions that prevent students from directly asking instructors how they're doing. Research on situations where one seeks feedback typically manipulated the "publicness" of this environment and concluded that individuals seek feedback more in private versus public contexts (VandeWalle et al., 2000; see Williams, Steelman, Miller, & Levy, 1999, for discussion on how this tendency can be reversed). For instance, Ashford and Northcraft (1992) found that without an audience effect, feedback-seeking frequency increased overall. Even when there are no particular fears or concerns with directly requesting feedback, computers (when available) are found to be a more preferred and consulted medium for performance information (see Ang & Cummings, 1995; Kluger, Adler, & Fay, 1991).

Given that perceived benefits of feedback seeking promote both monitoring and inquiry strategies and that on-line gradebook monitoring minimizes costs often associated with inquiry strategies, the following hypothesis is offered:

Hypothesis 1: Monitoring on-line gradebooks, when available, will be utilized more than

other feedback-seeking strategies to gauge classroom performance.

Goal Orientation and Feedback-Seeking Strategies

Dweck's (1986) education-based model of goal orientation is increasingly studied in organizational research and seen as an individual trait that significantly impacts performance management and feedback-seeking behaviors (Janssen & Prins, 2007; Payne, Youngcourt, & Beaubien, 2007; VandeWalle & Cummings, 1997; VandeWalle, 2003). It is viewed primarily as a dispositional goal preference that manifests in achievement environments in one of two contrasting patterns of motivational attitudes and corresponding behaviors. *Learning or mastery goal orientation* reflects a desire to increase one's competence and master new skills. Such individuals view performance feedback as diagnostic information on how to improve performance, and as a result, they may be more inclined to actively seek performance feedback, whether positive or negative (Butler, 1993; VandeWalle et al., 2000). In contrast, those with a *performance goal orientation* seek to demonstrate and validate the adequacy of their ability in achievement contexts, including the classroom and workplace. Because performance feedback to these individuals is seen as a judgment of their competency and intellectual worth, they actively seek information reflecting favorable judgments (performance-*prove* orientation) and avoid those suggesting negative assessments of performance (performance-*avoid* orientation; Day, Radosevich, & Chasteen, 2003; Tuckey, Brewer, & Williamson, 2002; VandeWalle & Cummings, 1997).

Underlying explanations for these different orientations reflect two primary theories. Dweck (1986) argues that goal-oriented individuals believe one of two explanations of intelligence: incremental or entity. Learning goal orientation reflects an incremental view of intelligence that, like performance, can be improved with increased effort. Performance goal orientation, in contrast, reflects an entity theory of intelligence, with the assumption that it is a fixed, unchangeable characteristic. Thus, individuals with a learning goal orientation seek feedback whether they are performing well or poorly, while performance goal-oriented individuals prefer to seek feedback only when performing well.

Offering an alternative theory, Nicholls (1975) asserts that depending on how individuals choose to define success, one of two approaches to learning emerges: "task involvement, in which individuals compare themselves with their past performance (self-referent), or ego involvement in which individuals compare their performance with others (external referent)" (Payne et al., 2007: 129). Learning goal-oriented individuals use self-referents (e.g., examining their current performance with their previous performance) while performance goal-oriented individuals use external referents (e.g., examining their performance in relation to others' performance). It is important to note that on-line gradebooks allow for comparison with both self- (previous assignment scores) and other referents (class averages). No research to date contrasts these two competing theories for goal orientation tendencies (Payne et al., 2007). Most studies, however, reflect an internal–external referent explanation (Elliot & McGregor, 1999, 2001; Elliot & Thrash, 2002) and related ego–impression management concerns.

Research by VandeWalle and his colleagues explored the connection between goal orientation and feedback-seeking strategies among adults (VandeWalle & Cummings, 1997; VandeWalle et al., 2000; VandeWalle, Cron, & Slocum, 2001). Overall, their findings show a positive relationship between learning goal orientation and feedback-seeking behavior and a negative relationship between performance goal orientation (particularly performance-avoid) and feedback seeking. Payne et al's (2007) meta-analysis found that both learning and performance-prove goal orientations were positively related to learning strategies. They also report that feedback seeking was positively related to learning goal orientation ($p = .24$) and negatively related to performance-avoid goal orientation ($p = -.27$). The relationship between feedback seeking and performance-prove goal orientation was not significant.

These findings suggest that on-line gradebook monitoring and other forms of self-referent feedback seeking (e.g., directly asking the instructor how well you are doing) follow a learning orientation. However, with no discernable audience effects, on-line monitoring also should appeal to those with a performance-prove goal orientation. This feedback-seeking strategy eliminates impression management concerns and makes available social comparison information. Performance-prove individuals also may pursue other feedback options with an external referent, such as talking with their peers or monitoring conversations of other students and faculty about performance on class assignments. However, given that feedback seeking may be tied to how well or poorly a student is currently performing, this may moderate the relationship between performance goal orientation and feedback-seeking strategies. More

specifically, Payne et al. (2007) suggested that knowledge of expectations may moderate the performance-prove goal orientation–feedback-seeking relationship. Therefore, the following hypotheses are proposed:

Hypothesis 2:   *Learning goal orientation will increase (a) on-line gradebook monitoring and (b) instructor inquiry.*

Hypothesis 3:   *Performance-prove goal orientations will increase (a) on-line gradebook monitoring and other feedback-seeking strategies with social comparison information, including (b) person monitoring, and (c) peer inquiry.*

Hypothesis 4:   *Performance-avoid goal orientations will decrease on-line gradebook monitoring and other feedback-seeking strategies.*

Hypothesis 5:   *Anticipated academic achievement will moderate the relationship between performance-prove goal orientation and feedback seeking.*

On-Line Gradebook Monitoring and Academic Performance

Consistent with social-cognitive models of self-regulated learning, trait goal orientation influences "proximal consequences," such as feedback seeking, which in turn predicts "distal" outcomes, such as academic performance (Bandura, 1991; Brown, 2001; Payne et al., 2007). Scholars often examine academic performance separately from learning; nevertheless, they consider it an indicator of learning, although it also may reflect motivation, time management, competencies, and various other factors (Payne et al., 2007). Relevant for this study, final course grade is the most common operationalization of academic performance.

Few studies examine feedback seeking's relationship to actual performance (Ashford & Black, 1996; Hwang & Arbaugh, 2006; Morrison, 1993), and none specifically address on-line gradebook monitoring. Nevertheless, an individual's feedback-seeking tendencies may be an important determinant of performance in settings where such information is readily available (Renn & Fedor, 2001). Monitoring one's class performance by accessing on-line gradebooks provides students with performance feedback that may motivate and activate them in ways that contribute to academic success, such as increased goal setting (Renn & Fedor, 2001). Continuous reminders of one's performance over the semester may prompt adjustments in effort deemed necessary to succeed in class. Easily accessed performance information from on-line gradebooks also provides content from which students may approach instructors or peers for assistance. Therefore, the following hypothesis is proposed:

Hypothesis 6:   *On-line gradebook monitoring will positively impact student academic achievement.*

METHOD

Prior to data collection, I contacted interested faculty and familiarized them with the on-line gradebook component of their institution's course management system—in this case, Blackboard. The training included freshmen seminar instructors and advisors for the business school who used Blackboard, but not its on-line gradebook option. At this time, the instructors standardized their individual course gradebook configurations to specifications they desired for the upcoming semester. The orientation and participation were voluntary.

All sections of this course followed a standardized syllabus, so students operated under consistent course requirements and deadlines. Students completed five quizzes, nine individual assignments, and one group project consisting of four separately graded components. They also accessed the same course website on Blackboard. Each instructor had a teaching assistant who posted grades on-line within 2 days of receiving graded exams and assignments. Teaching assistants also informed students via e-mail after posting grades on-line. This was standard policy across all 16 course sections.

Sample

Students enrolled in an eastern U.S. business school's Introduction-to-the-Major course participated in this study. Of 490 students enrolled in 16 sections, 274 volunteered. Average age of student participants was 18.3 years and 51% were female. With regard to race, 47% were White/Caucasian, 30% Black/African American, 16% Asian, 4.5% East Indian, 1.5% Hispanic, and 1.5% indicated "Other." Approximately 52% were unemployed, while 39.4% were part-time and 4.7% were full-time employees. All students were enrolled in a minimum of 12 course credits.

Procedure

In the last 3 weeks of this course, a 2-page "Feedback Survey" became available as a downloadable form on the class Blackboard website. Posting of the survey was announced on-line and in class,

along with information that this was one of several voluntary activities from which students could earn extra credit. Participants printed out and completed the survey and submitted it directly to the researcher's office. Instructions indicated this was an ongoing study of classroom feedback, that there were no wrong or right answers, and that individual responses would be confidential and viewed only by the researcher, who was not affiliated with the course. After students completed the survey, they sealed it in a plain envelope and wrote their name on the outside. This allowed student identification for assigning participation points and case numbers, while eliminating the need for identifiable information on the surveys. I maintained participants' student numbers initially in order to match final student point accumulations to data records of survey responses. Identifiable student information was removed following final data entry. Participants received researcher contact information to address any questions relevant to the study.

Students in this course also completed a schoolwide assessment of computer and information technology competence at the beginning (Time 1: September, $N = 455$) and end of their first semester (Time 2: December, $N = 405$). Average scores based on a 5-point scale ($1 = never$, $5 = constantly$) of this population's course management system (CMS) use prior to attending the university (Time 1: $M = 2.06$) and use by the end of their first semester (Time 2: $M = 4.39$) show substantial increases. Students also indicated their expertise in navigating the university's CMS at the beginning and end of their first semester (Time 1: $M = 2.43$ "learning basics" *vs.* Time 2: $M = 3.79$ "know basics plus"). Time 2 numbers indicate a sufficient degree of student competence in CMS use at the time of the survey.

Measures

Survey items requested student gender, age, race, and employment status—all used as controls for statistical analyses. Students' *anticipated* GPA for the semester ($M = 3.3$, based on a 4.0 scale) was used as the moderator variable for Hypothesis 5.

Goal Orientation

Goal orientation assessment involved slightly modified items from an instrument developed and validated by VandeWalle (1997). Five items measured *learning goal orientation* (e.g., "I like to do challenging assignments that I can learn a lot from"). Four items each measured *performance-prove goal orientation* (e.g., "I prefer to work on projects where I can prove my ability to others") and *performance-avoid goal orientation* (e.g., "I prefer to avoid situations in class where I might perform poorly").

Feedback-Seeking Behaviors

These served as both dependent and independent variables and reflect items developed by Ashford (1986) with wording adjusted for the classroom setting. Two items measured *instructor inquiry,* or the tendency with which students directly ask for performance feedback from instructors. Two items measured *peer inquiry,* or student tendency to directly ask for performance feedback from peers. Four items measured *person monitoring*, where students indirectly obtain performance feedback by observing faculty and peer interactions in the classroom. Two items measured student perceptions of their *on-line monitoring* via the on-line course gradebook. An objective measure of on-line gradebook monitoring also was used for predicting classroom performance. The number of times students accessed their class on-line gradebook, automatically recorded using Blackboard's tracking feature, allowed for a frequency count of student gradebook access.

Student Academic Achievement

Student academic achievement, the primary dependent variable, was the final averaged percentage earned by students for assignments completed over the semester.

Data Analysis

Table 1 lists descriptive statistics, correlations, and reliabilities calculated for the measures. All reliability estimates exceeded an acceptable .70 level. Correlation, *t* tests, hierarchical regression, ANOVA, and hierarchical linear modeling (HLM) procedures tested proposed hypotheses. In the regressions, three control variables—age, gender, and race (dummy coded as White, Black, Asian, East Indian, and Other)—entered in the first step. In regressions used for Hypotheses 2 through 4 and the ANOVAs conducted for Hypothesis 5, the specified dependent variables were on-line gradebook monitoring and the three other feedback-seeking strategies. In the HLM analyses used for Hypothesis 6, the dependent variable was student academic performance, with student employment status added as an additional control.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 Gender	.49	.50											
2 Age	18.3	.64	.17**										
3 White/NonWhite	.47	.50	.20**	.14*									
4 Learning goal orientation	3.66	.63	−.05	−.09	−.13*	(.80)							
5 Performance-prove orientation	3.51	.82	.10	.04	.07	.13*	(.81)						
6 Performance-avoid orientation	2.80	.88	.04	−.02	−.01	−.23**	.26**	(.80)					
7 Instructor inquiry	2.62	.88	.04	.04	.05	.25**	.20**	.08	(.77)				
8 Peer inquiry	2.54	1.09	.13*	.03	.10	.03	.23**	.13*	.44**	(.81)			
9 Person monitoring	3.41	.82	.08	−.03	.15*	.13*	.42**	.10	.35**	.49**	(.77)		
10 On-line monitoring	4.27	.89	−.15*	−.08	−.15*	.20**	.25**	−.04	.13*	.09	.29**	(.84)	
11 Total gradebook visits	9.94	9.56	.03	−.06	−.00	.10	−.03	−.07	.01	−.02	.04	.27**	
12 Final grade (point percentage)	67.8	10.35	−.08	−.15*	.08	−.00	.08	.07	−.02	−.01	.03	.25**	.08

Note. Reliabilities of measures on main diagonal.
*$p < .05$. **$p < .01$ (2-tailed). Gender (1 = male, 0 = female); Race (1 = White, 0 = Non-White).

RESULTS

To test Hypotheses 1 through 5, it was important to determine if monitoring peer and instructor behaviors in the classroom environment could be combined into one measure. The logic was that students often observe instructor and peer behavior simultaneously during class encounters with performance-relevant information, for example through marked, returned papers, discussions about grades, and so forth. An exploratory factor analysis with oblique rotation was performed, producing a 3-factor solution accounting for 66.6% of the variance among feedback-seeking strategies. Examination of the structure matrix showed both instructor- and peer-monitoring items loaded on Factor 1 (Eigenvalue = 3.75), suggesting these items could be combined into one "person monitoring" variable. Instructor inquiry items loaded on Factor 2 (Eigenvalue = 1.68) and on-line monitoring items loaded on Factor 3 (Eigenvalue = 1.24). Peer inquiry items had low factor loadings on both Factors 1 and 2, and consequently, were used as a separate feedback-seeking strategy.

To test Hypothesis 1, paired sample *t* tests compared the four feedback-seeking strategies. Results strongly support this hypothesis, which states that on-line monitoring would be the most used form of feedback seeking. Student on-line gradebook monitoring scores ($M = 4.27$) emerged significantly higher than person monitoring ($M = 3.42$, $t_{(273)} = -13.82$, $p < .000$), instructor inquiry ($M = 2.70$, $t_{(273)} = 21.12$, $p < .000$), and peer inquiry ($M = 2.54$, $t_{(273)} = -21.25$, $p < .000$). Person monitoring emerged significantly more than instructor inquiry ($t_{(273)} = 11.55$, $p < .000$) and peer inquiry ($t_{(273)} = 14.63$, $p < .000$). Instructor inquiry also was higher than peer inquiry ($t_{(273)} = 2.41$, $p < .02$). As far as preferences in feedback-seeking strategies, student scores reflect an overwhelming inclination for monitoring over inquiry, with on-line gradebook monitoring most preferred, followed by person monitoring, instructor inquiry, and finally, peer inquiry.

Hierarchical regressions tested Hypotheses 2 through 4 with control variables entered in step 1 and the three goal orientation variables entered in step 2. Results indicate a significant overall model ($F_{(9, 264)} = 5.70$, $p < .000$) and change in R^2 in step 2 ($\Delta R^2 = .10$, $p < .000$) for on-line monitoring (see Table 2, column 1). Learning goal orientation positively predicted on-line monitoring ($\beta = .13$, $p < .05$) and instructor inquiry ($\beta = .27$, $p < .001$), supporting Hypothesis 2. Performance-prove goal orientation positively predicted on-line monitoring ($\beta = .28$, $p < .000$), as well as person monitoring ($\beta = .38$, $p < .001$), and peer inquiry ($\beta = .17$, $p < .01$), supporting Hypothesis 3. Performance-prove goal orientation also positively predicted instructor inquiry ($\beta = .13$, $p < .05$). Performance-avoid goal orientation did not predict any feedback-seeking strategy, although related negatively to on-line monitoring and positively to peer inquiry (see Table 2). Consequently, Hypothesis 4, which proposed a significant negative relationship between performance-avoid goal orientation and feedback-seeking strategies went unsupported.

Hypothesis 5 proposed a moderating effect for how students perceive they are performing academically on the relationship between performance-prove goal orientation and feedback seeking. Multiple univariate ANOVA analyzed the four feedback-seeking strategies as dependent variables, and performance-prove goal orientation and anticipated class grade as the independent and moderator variables, respectively. Performance-

TABLE 2
Hierarchical Regression of Trait Goal Orientation on Feedback-Seeking Strategies

	Dependent Variables			
Predictors	On-line Monitoring	Person Monitoring	Instructor Inquiry	Peer Inquiry
Step 1				
Gender	.15**	−.04	−.04	−.13*
Age	−.07	−.06	.03	−.01
Black	.06	−.15*	−.13*	−.12
Asian	.13*	−.10	−.05	−.05
East Indian	.15**	−.01	.13*	.06
Other ethnicity	−.04	.01	.05	.07
Step 2				
Learning orientation	.13*	.11	.27***	.05
Performance-prove orientation	.28***	.38***	.13*	.17**
Performance-avoid orientation	−.09	.02	.01	.10
df	9, 264	9, 264	9, 264	9, 264
R^2	.16	.21	.13	.10
ΔR^2	.10***	.16***	.10***	.05**
F	5.70***	7.63***	4.48***	3.15***

Note. Reported coefficients are the standardized beta weights obtained from the final regression equation with all variables entered.

*$p < .05$. **$p < .01$. ***$p < .001$.

prove goal orientation variables were mean centered for the analyses. Significant interactions would indicate that how well students thought they were doing academically influenced the relationship between performance-prove goal orientations and feedback seeking. Although the interaction associated with person monitoring was suggestive ($F_{(81)} = 1.35$, $p < .06$), no other interactions in the ANOVA approached significance; thus, Hypothesis 5 was not supported.

Hierarchical linear modeling (HLM) helped test Hypothesis 6. This statistical procedure facilitates analysis of multilevel data, recognizing that individuals nested within groups—in this case, 16 different course sections—may be more similar to each other than individuals from different groups or sections. Consequently, the analysis simultaneously accounts for variances and covariances both within and between levels (Raudenbush & Bryk, 2002). Hierarchical linear modeling first creates a null or unconditioned model with only the dependent variable and group or section variable. Preliminary HLM analysis showed no between-section differences for on-line monitoring, but produced a highly significant chi-square statistic for final grade ($X^2 = 550.3$, $p < .000$), indicating group-level variability with grades.

Hierarchical linear modeling next creates a model with all control and independent variables at the individual level. These variables were grand-mean centered before inclusion in the model. Although grand-mean centering and raw metrics produce equivalent models, grand-mean centering is preferred because it reduces potential colinearity (Hoffman & Gavin, 1998). All feedback-seeking strategies were included in the HLM analysis. On-line monitoring positively predicted final student grade ($b = 1.86$, $p < .001$), supporting Hypothesis 6. No other feedback-seeking strategy was significant in the model.

A second HLM analysis retested the significant relationship between on-line gradebook monitoring and classroom performance by substituting an objective measure of on-line gradebook monitoring for the measure based on student perceptions. Archival data from a class website "tracking" statistics feature provided a total count of times each student accessed the class Blackboard website as well as the frequency they accessed their class on-line gradebook over the course of the semester. The number of times students accessed the class website ranged from 4 to 231 ($M = 68.5$; $Mdn = 54$; $SD = 40.1$) and the number of times students accessed the course on-line gradebook ranged from 0 to 69 ($M = 9.9$; $Mdn = 7.0$; $SD = 9.6$; see also Table 1). Excessive gradebook accessing more likely indicates performance anxiety than performance monitoring, such as when a nervous student accesses online gradebook multiple times in one day to check for the posting of a particular assignment grade. Therefore, in the second HLM analysis, I removed students whose gradebook accessing ex-

ceeded two standard deviations above the median ($n = 11$).

The frequency of on-line gradebook monitoring ($b = .22$, $p < .001$) also proved to be a significant predictor of classroom performance (see Table 3). Thus, both subjective and objective measures of performance monitoring through on-line gradebooks support Hypothesis 6's contention that it positively impacts student grade.

DISCUSSION

The primary purpose of this research was to determine if regular, unimpeded, and private performance monitoring by students using on-line gradebooks is an effective self-regulated learning practice for enhancing performance. Study results showed, first and foremost, that on-line gradebook monitoring is a prominent method among business students for obtaining performance information and also a robust predictor of their academic achievement. No other feedback-seeking strategy examined here predicted students' final course

TABLE 3
Hierarchical Linear Modeling Results Predicting Student Academic Achievement

Predictors	Subjective Measure Model		Objective Measure Model	
	b	SE	b	SE
Gender	1.12	.75	1.63*	.77
Age	−1.33*	.61	−1.33*	.63
Black	−2.32**	.89	−1.91*	.93
Asian	−.27	1.07	.15	1.10
East Indian	−.99*	1.80	−.58	1.95
Other race	−2.16**	2.25	−1.98*	2.30
Employment status	−.23	.53	−.21	.53
Instructor inquiry	−.56	.42	−.48	.44
Peer inquiry	.73	40	.80	.41
Person monitoring	−.37	.53	.01	.53
On-line monitoring (subjective model)	1.86***	.44		
Total gradebook visits (objective model)			.22***	.06
Final Estimate of Variance Components				
Level 1 (Individual) Variance	30.2		31.2	
Level 2 (Section) Variance	80.5		87.4	
Explained Variance Level 1	.08		.08	
Explained Variance Level 2	.09		.03	
Model $X^2_{(14)}$	550.3***		556.6***	

Note. Reported coefficients are the unstandardized beta weights obtained from the final HLM equation. Drop out category for dummy-coded race variables was White.

*$p < .05$. **$p < .01$. ***$p < .001$.

grade. The significant findings overwhelmingly indicate a preference for and an academic benefit from students monitoring their classroom performance by accessing on-line gradebooks. Results point to the value of providing this information to students, exploring this concept further to replicate findings, and examining other possible antecedents and consequences of on-line gradebook monitoring.

Second, results indicate that both learning and performance-prove goal orientations increased on-line gradebook monitoring as well as instructor inquiry, although the relative significance of each approach reflects a reverse pattern. As important, this indicates that one strategy does not negate the other. These two self-monitoring (feedback-seeking) strategies may work concurrently, perhaps with on-line monitoring triggering subsequent instructor inquiry. As performance-prove goal-oriented students used faculty inquiry less than learning goal-oriented students, this may reflect more salient impression management concerns. Further, student use of instructor inquiry over peer inquiry supports research findings that feedback seeking increased with source availability and expertise (Vancouver & Morrison, 1995; see also Ashford & Tsui, 1991). As these were relatively small, introductory courses, freshmen could approach "course expert" faculty more easily than in, for instance, a large lecture environment.

Somewhat surprising was the negative (though insignificant) relationship between instructor inquiry and student final grade. However, it is reasonable to assume that students often approached faculty *because* they were doing poorly in class. Research on feedback seeking during organizational transition (a reasonable metaphor for business freshmen adjusting to their first semester at college) shows that those transitioning poorly eventually (Time 2 *vs.* Time 1) seek feedback from supervisors and less frequently, peers (Brett, Feldman, & Weingart, 1990). Many educational institutions now require faculty to inform first- and second-year students of unsatisfactory performance by the fifth week of class—based on attendance, assignments, exams, or any combination of the three. This allows students the opportunity to drop the course or, preferably, to change their approach or effort. On-line gradebook monitoring serves a similar function. Here students can become aware of performance problems earlier in the semester, which may prompt them to approach instructors or peers sooner for assistance.

Third, although gender and race differences were not a primary focus of this research, study findings provide insight on differences in on-line monitoring and feedback-seeking tendencies. In this study, fe-

male students used on-line gradebook monitoring more than males, suggesting women may benefit the most from available and maintained on-line gradebooks. Research on gender differences with information technology perceptions and use previously found that men generally favor information technologies more than women (Lie et al., 2005; Schumacher & Morahan-Martin, 2001; Simon, 2001; Van Slyke, Comunale, & Belanger, 2002). Nevertheless, research indicates that men and women do not differ significantly with their on-line abilities (Hargittai, & Shafer, 2006), although they may have different motivations. For instance, a study involving information retrieval technologies reported men influenced by perceived usefulness, while women followed ease of use and social norms (Venkatesh & Morris, 2000). Perhaps the female students in this study were more compliant than their male counterparts with their teaching assistant's e-mail requests to "check their grades online"—which ultimately proved advantageous. The HLM analysis for the objective (frequency count) measure of on-line monitoring shows a positive relationship between females and final class grade. In this same analysis, peer inquiry approached significance ($b = .80, p < .06$), suggesting this might reflect an alternative strategy for enhancing class performance. The correlation table reports a positive relationship between men and peer inquiry for performance monitoring ($r = .13, p < .05$). Males also exhibited a greater tendency toward performance-prove goal orientation than females; thus, interacting with peers and friends from class may address male student well-being goals as well as provide useful social referents for monitoring.

Regarding race/ethnicity, this research shows Asian and Indian students most likely to regularly check assignment grades on-line, while only Indian students actively used instructor inquiry as a feedback-seeking strategy. Cultural norms including collectivism and concern for face may create tendencies among Asian students to engage in more monitoring and "indirect" performance inquiries (Sully de Luque & Sommer, 2000). For instance, research shows U.S. employees reported more feedback inquiry as new hires than employees from Hong Kong (Morrison, Chen, & Salgado, 2004). Research on feedback-seeking choices in intercultural environments suggests minority races within a culture may perceive increased effort costs of feedback seeking via inquiry, especially if there are language differences (Ashford et al., 2003). Indian students did not appear to operate under the same cultural or language constraints as the Asian students. Further, Blacks and "Others" (which included Hispanics) earned significantly lower course grades than Whites. No differences emerged between Black and White students

regarding on-line monitoring—both reflected a positive, but nonsignificant relationship. In contrast, Hispanic (and Other race) students showed different self-monitoring tendencies. This group's beta weight valences for each feedback-seeking strategy were opposite those of Black students. Also, Black students used significantly less person monitoring and instructor inquiry than Whites, and their lack of peer inquiry approached significance in both regressions. Limited research on African American professionals reports their fear that feedback-seeking practices might confirm negative group stereotypes was positively related to more frequent monitoring, but did not predict inquiry (Roberson, Deitch, Brief, & Block, 2003). The unique responses among ethnicities of this study reinforce the benefits of examining race/ethnicities separately. Rather than categorize study participants as simply White/Non-White when conducting research on feedback seeking and technology use, it is helpful to acknowledge and control for significant differences in perceptions and behaviors among different ethnic/cultural groups (Geddes & Konrad, 2003).

Limitations and Future Research

Study findings should be considered in light of its limitations. Survey methodology introduces the possibilities of common method and self-selection bias. To reduce common method bias (Podsakoff, MacKenzie, Lee, Podsakoff, 2003), I collected the final grade dependent variable separately from independents, and assessed the key independent variable (on-line gradebook monitoring) using both a subjective measure as well as objective frequency scores. Regarding self-selection concerns, population and sample average final grades were similar (65.3% and 67.8%, respectively), suggesting survey participation was not significantly skewed toward high achievers. In a related manner, cross-sectional data can introduce limitations with regard to causal claims. Given that this study did not control for previous student classroom achievement, it is important to ascertain whether on-line gradebook monitoring leads to good performance or good students use on-line gradebooks to monitor their progress.[1] Alternatively, there may be other, unexamined motivational constructs affecting both feedback-seeking practices and academic performance (e.g., need for

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[1] In a recent study [Geddes & Hartley, 2008], high school GPA was used as a control in analyses involving on-line gradebook monitoring and class performance. Hierarchical regression results indicated both GPA and on-line monitoring were significant, positive predictors of class grade.

achievement). Future research should continue to examine other potential variables impacting the positive relationship between on-line gradebook monitoring and academic achievement.

Another possible limitation is that the study examined only freshmen. Thus, continuing research should ascertain study findings' robustness and generalizability as on-line gradebook use is examined across student rank, and among traditional and growing "nontraditional" business student populations. Future research also should consider other important academic outcomes besides class grade, for example, student retention, which may result from self-regulated learning practices such as feedback seeking. Finally, future studies examining moderators affecting feedback seeking and goal orientation should use a measure of perceived academic achievement specific to the *course*, rather than the overall semester.

Study findings emphasize the importance of feedback seeking through monitoring strategies. Thus, future research needs to explore further how and why performance monitoring benefits business students, and ultimately professionals in their chosen careers. Two explanations for monitoring preferences exist in the literature, typically associated with performance-goal oriented individuals—external referents providing social comparison information and reduced impression management/ego risks to one's perceived competence or intelligence (Dweck, 1986; Nicholls, 1975). Most scholars focus on the second motive and argue that one's known or perceived performance (good or bad) moderates individual tendencies to seek feedback—prompting many to use monitoring (Ashford & Northcraft, 1992; Fedor et al., 1990; Payne et al., 2007; Stapel & Tesser, 2001). However, one consequence of performance monitoring through on-line gradebooks is the opportunity to regularly self-assess using social comparison information (Ross et al., 2003; Tuckey et al., 2002). Thus, future research should explore social comparison preference as a potential moderator for feedback seeking and performance goal orientation. It is possible that social comparison information may be less associated with an ego-enhancing function than many assert. It may instead help students gain perspective by developing a more realistic interpretation or understanding of their current class performance.

Evidence for this proposition is found in the literature on self-assessment and rater accuracy (Atwater, 1998; Farh & Dobbins, 1989). Business students, like the organizational members they will become and manage, may tend toward inflated views of their own performance. Research shows that 80% of individuals in achievement situations evaluate themselves as above average or better—a statistical impossibility (Pearce & Porter, 1986; see also Dunning, Heath, & Suls, 2004). This becomes problematic for individuals both as students and as future employees. Believing one's performance or relative standing is better than it really is may lead to reduced effort, increased defensiveness with regard to negative feedback, and less motivation to change one's behavior over time (Ashford, 1989; Atwater & Yammarino, 1997). Once graduated, individuals who inflate self-ratings are more likely to be evaluated as poor employees by their respective managers (George & Smith, 1990).

To combat inflated views of one's performance and thereby enhance the accuracy of self-perception and self-assessment, individuals can benefit from the opportunity for social comparisons (Foddy & Crundall, 1993; Wilson & Ross, 2000). Research indicates that self-assessments become more realistic with specific information on how others in comparable tasks are performing (Atwater, 1998; Fletcher & Baldry, 2000). Feedback seeking through monitoring on-line gradebooks regularly exposes students to social comparison information, including class averages, assignment score ranges, points possible, and points attained. In addition, instructors may post sample top papers or best essay responses to class websites for students to peruse and compare. Having social comparison information available anytime on the Internet throughout the semester likely helps students maintain more realistic perceptions of their individual performance. This, in turn, could activate various self-regulated development practices as they learn if and when changes in their performance are necessary. In a related matter, future research also should examine individual traits (e.g., self-esteem, self-confidence, etc.) that may impact student interpretation of social comparison information. For instance, research shows that people with low self-esteem interpret any particular comparison experience (upward or downward) in a negative light (McFarland & Miller, 1994), which may not prove beneficial or motivating for improving performance.

Another area for potential research involves examining if and how various feedback-seeking strategies interact or combine with each other to assist learners. Research shows that in the work environment, loss and impression concerns are especially salient for newcomers; consequently, they were likely to initially use monitoring more than inquiry when feedback seeking (Morrison, 1993). Further, monitoring tends to remain constant overtime, while peer inquiry, in particular, declines

(Callister & Kramer, 1999). Monitoring then may serve as the primary form of feedback seeking, with inquiry used only if monitoring proves insufficient, such as when students seek information unavailable except through inquiry (e.g., process feedback). Thus, limitations of one strategy of feedback seeking may be overcome by adding another approach. For instance, previous research found that *combining* monitoring and inquiry enhanced role clarity at work (Brown, Ganesan, & Challagalla, 2001). It is important for future research to determine if the absence of on-line monitoring—either by choice or lack of availability—leads to significant use of other feedback-seeking strategies or simply less self-monitoring overall.

Implications for Practice

Understanding self-regulated learners' motivation and tendencies can help management faculty establish learning environments that trigger or take advantage of self-monitoring practices (Alavi & Leidner, 2001). Further, it is important to recognize student perspectives on and experience with new technologies available in their learning environment (Hwang & Arbaugh, 2006). This study indicates on-line performance monitoring is both prevalent and preferred among management students. Over 90% of survey respondents agreed or strongly agreed with the survey item, "I wish all faculty would post grades on-line." An internal study conducted the same year these data were collected reported that while approximately 90% of business faculty used the course management system, less than one third utilized its on-line gradebook component. Management faculty should consider the potential benefits afforded students from maintaining on-line gradebooks and helping develop *enhanced* self-monitoring skills needed to adapt to rapidly changing work environments.

Reports indicate the increasing prominence of on-line gradebook use across K-12 and postsecondary educational institutions nationally (Barker, 2004; Campus Computing Project, 2006). Consequently, management faculty will increasingly teach business students previously immersed in this technology, who may have already come to rely on accessing on-line gradebooks as a performance monitoring strategy. If this technology is underutilized by management faculty, entering freshmen—especially freshmen women—could be disadvantaged at a particularly vulnerable time in their educational experience. This is especially true in courses adopting a large lecture format, where it is more difficult to directly approach the instructor to elicit performance feedback.

Faculty, however, may need to do more than post grades on-line to promote self-monitoring among business students. Lessons learned from technology-mediated training (e-learning) show instructors often make assumptions of high levels of self-direction by students. However, this study suggests some students do not use on-line monitoring or effectively engage in self-monitoring, feedback-seeking strategies. Research shows that individuals induced to follow self-regulated e-learning strategies did better on outcomes than those who were not required to do so (Santhanam, Sasidharan, & Webster, 2008). Thus, faculty may not only need to post grades for their students' benefit, but also convince (or reward) them to use the resource. This strategy may be particularly important for male students who adopt technology based on its perceived usefulness (Lie et al., 2005; Venkatesh & Morris, 2000). Students convinced of the advantages of self-monitoring will be more likely to adopt one or several strategies, depending on disposition and information availability.

Another practical implication of on-line gradebooks includes the possibility of management faculty separating outcome from process feedback on student assignments. In the classroom, the common practice is to return essays, memos, reports, and so forth, with both (1) comments on ways to improve the paper (process feedback), and (2) the actual grade earned (outcome feedback). However, there are logical problems with managers (or faculty) acting as judge and coach simultaneously when providing performance feedback, as noted in the seminal piece by Meyer, Kay, and French (1965). It is no surprise that employees are less defensive and more receptive to feedback—especially negative feedback—when they see the source acting as coach or mentor, rather than judge.

Personal experience shows that when papers are returned, students immediately look for the grade, and then view written comments in light of that outcome judgment. In other words, grades act as a perceptual anchor from which students evaluate commentary from the instructor (Geddes, 1999). If the grade is low or simply lower than expected, students are likely to view the comments more defensively than if no grade is present. Thus, performance coaching without an immediate, corresponding performance judgment may increase the likelihood process or developmental feedback will be accepted and utilized by students. The practice of separating process from outcome feedback is likely more common in work environments than educational settings. Nevertheless, availability of on-line gradebooks would allow manage-

ment faculty to experiment with this delivery technique for performance information and potentially enhance the benefits of both feedback forms.

Beyond the classroom, elements of on-line gradebook technology are emerging in certain human resource workplace technologies. The corporate world is beginning to offer a platform similar to on-line gradebooks from which employees may self-monitor relevant performance information. For example, corporate performance appraisal software packages increasingly incorporate an "employee self-serve" capability that allows organizational members access to certain performance and appraisal databases associated with their own performance management (Holinchek, 2004; Morfeld, 2000; Rae-Dupree, 2004). To date, no known research is available that examines this feature of appraisal software's impact on employee self-monitoring, performance regulation, or professional achievement. Nevertheless, previous exposure to similar technology may prove advantageous to organizational members and managers in particular, who hope to provide useful feedback within the work environment.

CONCLUSION

Over the past few decades, scholars' interest in student self-regulated learning strategies reflects recognition of its critical role in continued academic and professional success (Bradley-Klug, Shapiro, Reinecke, Dattilio, & Freeman, 2003). The positive relationship between continuous learning and improved performance is at the heart of management education as well as the management function. Our students are encouraged to set high, but achievable goals, monitor their progress, and regulate their effort as they accomplish various assignments. Faculty assist in this learning process not only with a valued curriculum but also by providing timely, ongoing feedback on tasks and assessment of individual progress toward course objectives. It is important that students develop an ability to sense how well their academic efforts yield favorable results if they want success both in and out of the classroom. On-line monitoring and other self-monitoring and feedback-seeking strategies can serve as vehicles to promote critical reflection that will help establish logical connections between student actions and subsequent outcomes. By promoting students' abilities and tendencies to self-monitor/self-regulate using available technologies and other accessible, reliable information sources, management faculty may improve their future growth and success in

all achievement contexts—academic as well as professional.

APPENDIX

Items for Measures Used

Learning goal orientation

I like to do challenging assignments that I can learn a lot from.

I often look for opportunities to develop new skills and knowledge.

I enjoy challenging and difficult assignments where I'll learn new skills.

For me, development of my intellectual abilities is important enough to take risks.

I prefer to work in situations that require a high level of ability and talent.

Performance-prove goal orientation

I want to show that I can perform better than my fellow students.

I try to figure out what it takes to prove my ability to others.

I enjoy when others in class are aware of how well I am doing.

I prefer to work on projects where I can prove my ability to others.

Performance-avoid goal orientation

I would avoid volunteering for a particular part of a group assignment if there was a chance I would appear incompetent.

Avoiding a show of low ability is more important to me than learning a new skill.

I'm concerned about taking on assignments that might reveal I had low ability.

I prefer to avoid situations in class where I might perform poorly.

Instructor inquiry

I talk to the instructor to get additional information about my classroom performance.

In order to find out how well I am performing in class, I talk with my instructor.

Peer inquiry

I talk to my fellow students to get information on how well I'm doing in class.

In order to find out how well I am performing in class, I talk with my classmates.

Person monitoring

I pay attention to how my instructor acts toward me to figure out where I stand in class.

I compare what I'm doing with other students in class.

I observe fellow students who are rewarded or acknowledged by the instructor for doing a good job.

I keep my ears open to hear how well other students are doing on class assignments.

On-line gradebook monitoring

I check my grades on-line via Blackboard to find out how I am doing in class.

(Appendix continues)

In order to find out how well I am performing in class, I check grades on-line through Blackboard.

Note. Likert scale response format.

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