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Self-Regulation in Academic Writing Tasks

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This study investigated writing beliefs, self-regulatory behaviors, and epistemology beliefs of preservice teachers in academic writing tasks. Students completed self-report measures of self-regulation, epistemology, and beliefs about writing. Both knowledge and regulation of cognition were positively related to writing enjoyment, and knowledge of cognition was negatively related to beliefs of ability as a fixed entity. Enjoyment of writing was related to learnability and self-assessment. It may be that students who are more self-regulated during writing also believe they can *learn* to improve their writing skills. It may be, however, that students who believe writing is learnable will exert the effort to self-regulate during writing. Student beliefs and feelings about learning and writing play an important and complex role in their self-regulation behaviors. Suggestions for instruction are included, and continued research of students' beliefs and self-regulation in naturalistic contexts is recommended.

"Why do we need to write another paper?" "I hate writing!" "I'm a terrible writer!" Remarks such as these may often be heard from the same students who plan careers that require a high degree of writing skills, such as education, science, or business. For many students, this transition between functioning as student writers and future writers in a discipline can be an awkward one (Herrington, 1985). Students may be unsure about the shift from "being receivers of teaching knowledge to being constructors of such knowledge" (Meyer, Flores-Duenas, & Rossi, 2000, p. 18).

This shift is especially problematic when the students involved are pre-service teachers. These learners are the future teachers who will be responsible for writing instruction in their classrooms, as well as constructing and integrating writing activities in multiple subjects to support their students' learning (Bandura, 1993; Bruning & Horn, 2000; Johannessen, 2001; Wade, 1995). Sitko (1998) has observed that "Writing is a complex activity. Learning how to write is even more complex" (p. 112). Educators might add that teaching pre-service teachers how to teach writing could be the most complex of all.

Review of the Literature

Writing is an essential part of thinking and learning in school contexts, particularly in light of 21st Century demands (e.g., Johannesen, 2001), and writing tasks are a "critical tool for intellectual and social development" (Bruning & Horn, 2000, p. 30). Academic writing may be assigned for a variety of educational goals: assessing knowledge, promoting critical thinking, stimulating creativity, encouraging discourse as part of a professional community, and supporting cognition (e.g., Bandura, 1993; Herrington, 1985; Johannesen, 2001; Langer, 1984, 2001; Raphael, Kirschner, & Englert, 1988). Therefore, students' ability to present information and ideas through their writing has "an integral role in academic and professional success" (Applebee, Langer, Mullis, Latham, & Gentile, 1994, p. 25).

Furthermore, writing is a way for students in all content areas to make meaning for themselves (Bereiter & Scardamalia, 1987) as well as to learn how to think and communicate in their particular domains (Herrington, 1985). For example, writing is an important means through which students begin to think more like teachers, mathematicians, or scientists, and less like students learning course concepts primarily for assessment purposes. However, the ongoing concern about deficiencies of the writing quality of American students remains a focal topic of instruction and research.

Research Themes

Concern about the quality of students' writing performance has stimulated many research studies, along with encouraging a variety of instructional interventions and suggestions (e.g., Bereiter & Scardamalia, 1987; Langer, 2001 ; Zimmerman & Bandura, 1994). Many instructional recommendations for improving writing have included teaching writing strategies, such as explicit procedures for writing in various genres (e.g., Bereiter & Scardamalia, 1987; Crowhurst, 1991; Graham & Harris, 1997; Langer, 2001). For example, students who are taught explicit strategies for text organization produce higher quality essays than do students without strategy instruction (Crowhurst, 1991; Raphael & Englert, 1990).

Other instructional recommendations include developing students' motivation to write (Bruning & Horn, 2000; Zimmerman & Bandura, 1994). Specific

examples of motivational recommendations include instructors modeling writing enjoyment (Draper, Barkesdale-Ladd, & Radencich, 2000), strategy use, and writing success attributions to strategies (Zimmerman & Bandura, 1994). Other effective instructor practices include assigning writing tasks that require students' active engagement and higher-order thinking; these tasks are associated with less student boredom and higher degrees of intrinsic motivation (Miller, Adkins, & Hooper, 1993; Perry, 1998).

Also important when teaching writing is knowledge of one's students. This knowledge includes students' beliefs and behaviors such as their perceived self-efficacy for writing and self-regulation, as well as awareness of their learning beliefs and behaviors (Charney, Newman, & Palmquist, 1995; Palmquist & Young, 1992; Schraw & Dennison, 1994; Zimmerman & Bandura, 1994). For example, higher levels of perceived self-efficacy in writing are related to higher levels of strategy use and attribution to strategies (Zimmerman & Kitsantas, 1999). Students' writing self-efficacy is also related to their increased effort and mastery goals (Perry, 1998). Moreover, mastery goals in writing may be inversely correlated with students' apprehension about writing tasks (Pajares, Britner, & Valiante, 2000). In other words, students who want to learn and master writing report being less apprehensive about it.

The belief of writing as learnable is particularly important for pre-service teachers, especially since their own beliefs have the potential to affect the learning of many of their future students. It may be that if students believe that writing is a fixed ability, they may not see the value in academic writing tasks, writing-intensive courses, or in providing writing instruction to future students. Furthermore, instructors who understand their students have the potential to plan more effective instruction to include writing strategy knowledge and use, as well as self-motivation strategies (e.g., Pintrich, 2000; Zimmerman & Kitsantas, 1999). Therefore, it is important for instructors of pre-service teachers to know what their students believe about writing themselves and the writing tasks they are expected to master and ultimately teach.

Writing Beliefs and the Teacher's Role

In the writing research, the importance of classroom contexts in writing tasks is a recurrent theme (e.g., Graham & Harris, 1997; Langer, 2001; Palmquist & Young, 1992; Perry, 1998). Therefore, the teacher's role is critical, because the teachers are responsible for classroom learning activities, including writing tasks such as essay exams, reports, and journals. A clearer understanding of these classroom contexts is essential since teacher practices have the potential to influence students' beliefs about writing—both positively and negatively (e.g., Draper et al., 2000; Palmquist & Young, 1992; Perry, 1998).

Research studies indicate that across a range of grades, teachers' practices can encourage or discourage students' self-regulated behaviors in writing tasks, including sustained effort and mastery orientation (Draper et al., 1998; Langer, 2000; Pajares et al., 2000; Perry, 1998). For example, students of varying ages report higher writing enjoyment when teachers encourage student selection of genre and topic (Daisey, 2003; Hammann, 2003). Also effective is explicitly teaching students to plan and organize in various genres. Students who have received this instruction have displayed a better understanding of the importance of planning in their writing (Bereiter & Scardamalia, 1987; Meyer, 1982) as well as being aware of choices as they weighed effort and outcomes in their writing tasks (Gordon, 1990a, 1990b). It seems important for educators to know when (and if) students are aware of these choices as they plan their writing tasks, and are able to make them.

Students' also report higher writing self-efficacy when teachers focus on mastery learning (Perry, 1998). In contrast, teachers who rely on drill and rote approaches to writing are described negatively by their students (Draper et al., 2000; Miller et al., , 1993). In addition, activities of the "skill and drill" type were associated with higher levels of student boredom as well as lower levels of cognitive processing (Miller et al., 1993).

It would seem, then, that instructor awareness is crucial for planning effective learning opportunities with writing-related tasks. Therefore, this understanding of the teacher's role and classroom practices should begin with the education of pre-service teachers (Young, Grant, Montbrian, & Therriault, 2001). These individuals will be responsible for the writing practices in the 21st Century classroom with students from diverse cultural and linguistic backgrounds, as well as diverse ability levels (Fillmore & Snow, 2000; Johannesen, 2001).

Epistemology beliefs. Individuals' epistemological beliefs are important because the "explicit or implicit assumption…is that personal epistemological theories are precursors to various academic outcomes" (Pintrich, 2002, p. 406). Epistemology beliefs include beliefs about human knowledge and the process of knowing (Hofer, 2000; Schommer, 1990, 1998) as well as domain beliefs (Pintrich, 2002). An illustration would be students who believe that learning occurs quickly may not persist in a task if they do not master it immediately (Schommer, 1990).

Students' beliefs in the nature of learning may also differ across different content areas (e.g., Charney et al., 1994; Hofer, 2000; Schommer, 1993). For example,

first-year college students majoring in psychology were more likely to report "personal knowledge and firsthand experience as justification for knowing" (Hofer, 2000, p. 394) than were first-year science majors. These beliefs may hinder students' understanding of the importance of theories and research in a domain. Students' epistemological beliefs may have negative influences as well. For example, college-age students may be more resistant to learning to learn than younger students, even when faced with evidence that their previous strategies have been unsuccessful (Hofer, Yu, & Printrich, 1998).

In the writing process, students' epistemological styles have been correlated with their enjoyment of writing as well as their beliefs about it (Charney et al., 1995). . These researchers found that college students who believed that that writing was learnable also had positive feelings about writing, as well as high scores on epistemology evaluativism (beliefs that truth-seeking is an evaluative process). Perhaps students who have higher evaluativism beliefs appreciate the opportunities that writing can provide for them to discover and evaluate their own truths.

Writing beliefs. Academic writing is an area where students' beliefs have a particularly strong influence (Charney et al., 1995 Nelson, 1990; Palmquist & Young, 1992; Perry, 1998; Young et al., 2001; Zimmerman & Bandura, 1994). For example, in an introductory college composition course, students who reported believing that writing ability was a "gift" also reported high levels of writing apprehension and low levels of writing self-assessment (Palmquist & Young, 1992). In contrast, primary students in classrooms that promoted writing self-regulation, along with meaningful writing activities, reported more positive attitudes about writing and more reliance on writing strategies (Perry, 1998).

As with epistemology beliefs, differences in students' writing beliefs have also been reported across various content areas (e.g., Bridgeman & Carlson, 1984; Charney et al., 1995; Pajares et al., 2000). For example, Charney et al. found that students in upper-level courses reported liking writing better than did students taking freshmen composition courses, with humanities majors reporting the highest liking, followed by social sciences and business, with technical writing last. Interestingly, faculty from different content areas disagreed about the importance of writing (Bridgeman and Carlson, 1984). For example, in the areas of civil and electrical engineering, writing was rated as more important for professional success than for graduate work success. In studies of pre-service teachers, researchers have found students' writing beliefs range from viewing writing as an important part of their future classrooms (Draper et al., 2000) to stating that writing is the hardest language arts area to teach and will receive minimal instruction in their future classrooms (Lickteig, Johnson, & Johnson's study as cited in Young et al., 2001).

Therefore, consideration of learners' perceptions about writing is particularly important for the instruction of pre-service teachers. However, the recommended focus on writing and writing instruction is not limited to language arts or composition classrooms but includes multiple domains where writing is used to support learning and cognitive development, assess knowledge acquisition, and stimulate creativity.

Writing and Self-Regulation

Self-regulation integrates learning behaviors or strategies, motivation, and metacognition (e.g., Pintrich, 2000; Schunk & Ertmer, 2000; Winne, 1995). In writing tasks, students' self-efficacy perceptions can be powerful predictors of their academic success (Zimmerman & Bandura, 1994), as well as influencing their effort and intrinsic motivation (Perry, 1998). In addition, writing tasks that require high levels of cognitive engagement are related to higher levels of intrinsic motivation and self-monitoring activities (Miller et al., 1993; Perry, 1998).

Students' knowledge of writing strategies may affect how they plan their writing, including content generation, use of library sources, and even choosing to plan at all (e.g., Bereiter & Scardamalia, 1987; Gordon, 1990b; Perry, 1998). For example, second- and third-graders have reported searching for more effective strategies on their own before asking for help (Perry, 1998). In addition, even the students identified as possessing low-ability ones were positive about the improvement in their writing and displayed a mastery focus.

It is not surprise, then, that instruction in self-regulatory strategies for academic writing is a recurring recommendation from research (e.g., Harris & Graham, 1996; Langer, 2001; Zimmerman & Risemberg, 1997). It may be that students' who are *taught* effective writing strategies will be able to attribute their writing difficulties to inappropriate strategy use rather than the lack of the "gift" of writing ability. On the other hand, it may be that students who believe that they are "poor writers," or that writing ability is a "gift," may not put forth the effort to learn and apply writing strategies, even when provided with appropriate instruction and support. An important goal is to better understand how writing self-regulatory processes develop (Zimmerman & Risemberg, 1997). Of equal concern is a clearer understanding of why students *do not* use self-regulation in writing activities (Graham & Harris, 1997; Zimmerman & Risemberg, 1997), even after explicit instruction.

The above recommendations have guided this study. This study was designed to provide information about the self-regulatory behaviors and beliefs of preservice teachers in academic writing tasks to guide future instruction and research. This study had three research questions: (a) What is the relationship between preservice teachers' epistemology beliefs and their writing beliefs? (b) What is the relationship between preservice teachers' writing beliefs and their self-regulation behaviors? (c) What is the relationship between preservice teachers' self-regulation behaviors and their epistemology beliefs?

Methods

Procedures

Data were collected as part of regular course requirements, but only students who gave consent had their measures used in the data analysis (n = 82). Measures were collected early in four semesters, except for rubrics for five field observation papers, which were completed as papers were due. Only field observation papers received grades (course requirement); other measures were recorded as completed/uncompleted.

Participants

Participants were preservice teachers (69 females, 13 males) at a large midwestern university. They met admission requirements to the College of Education, including completion of 30 credits and a grade of A or B in a required Composition I class. (Students whose grade was a C or below were required to pass the Praxis I Writing exam.) Sixty-five students identified themselves as "traditional," while the remaining 17 students identified themselves as non-traditional. However, this university is primarily a commuter campus, and many students take five or more years to complete their programs. These students were in their first series of education courses: Characteristics of Learners, and Teaching and Learning Strategies (educational psychology). The participants included students distributed across four course sections, two sections of Early Childhood, one each of Middle Childhood and Secondary. This class was blocked with a methods class, taught by another instructor.

Course writing requirements included five field observation papers, a comprehensive project, exam essays, and several short written assignments. Course requirements were standardized across all sections in compliance with department policy.

Measures

Self-report measures were chosen to collect quantitative and qualitative data, and students were instructed to answer in the context of the class. Quantitative measures included the following: (a) The Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994); (b) the Epistemological Questionnaire (Schommer, 1998); (c) the Writing Attitudes Survey (Charney et al., 1995). These instruments were scored in accordance with previous researchers' procedures (Charney et al., 1995; Schommer-Aikins, personal communication, June 19, 2002; Schraw & Dennison, 1994). In addition, series of one-way ANOVAs for each measure was calculated to determine if there were statistically significant differences among the different sections on the three measures; no statistically significant differences were found, so data were combined across semesters.

The Metacognitive Awareness Inventory. The Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994) was used to measure self-regulation. The MAI is a 52-item self-report instrument of adolescent and adult metacognitive awareness. The items are based on the Brown (1987) two-component model of metacognition, Knowledge of Cognition and Regulation of Cognition. Items load on two scales: Knowledge of Cognition and Regulation of Cognition. The Knowledge of Cognition scale is designed to reflect what students are aware of about their individual thinking processes. A typical item is "I am a good judge of how well I understand something." The Regulation of Cognition scale indicates learners' awareness of control of their learning processes, with items such as "I think of several ways to solve a problem and choose the best one." Students responded to these items by indicating degrees of agreement with each statement on a Likert-type scale, ranging from a score of one (Never True) to a score of five (Always True). Students' scores for each factor were determined by the loading scores from Schraw & Dennison (1994). Knowledge of Cognition scores ranged from 73-120, and Regulation of Cognition Scores ranged from 54-134.

The MAI has been demonstrated to have high internal consistency of the two factors, which are highly correlated and is a "reliable initial test of metacognitive awareness" (Schraw & Dennison, 1994, p. 472). Internal consistency statistics range from r = .90-.95 (Dennison, 1997). Furthermore, the researchers found the MAI to have strong predictive validity for test performance and self-monitoring in academic tasks. Subsequent studies with the MAI have supported these findings, including a test-retest reliability of about .85 (Sperling, 1997). However, further information about convergent, divergent, and construct validity was not available.

The Epistemological Questionnaire. The Epistemological Questionnaire (Schommer, 1998) is a self-report measure of students' beliefs about the nature of knowledge and knowing. It is made of up 63 items loading on four factors representing a range of personal epistemological beliefs: Fixed Ability, Simple Knowledge, Quick Learning, and Certain Knowledge. For example, the Fixed Ability factor indicates agreement with items such as "The ability to learn is innate" and disagreement with items such as "Students have a lot of control over how much they can get out of a textbook." An example of Simple Knowledge would be "Educators should know by now which is the best method, lectures or small group discussions." For the Quick Learning factor, a representative item is "Successful students understand things quickly." For Certain Knowledge, a typical item is "Truth is unchanging."

Schommer (1990; 1993) has reported reliability and validity testing for the Epistemological Questionnaire; the instrument reliably measures adolescents' and adults' epistemological beliefs and yields a four-factor model of epistemology. Schommer (1993) has reported test-retest reliability of .74, as well as interitem reliability of .63-85. However, she (2002) has also pointed out that other instruments exist which yield different factor results. For example, disagreement exists about the nature of epistemological beliefs being independent of domains (e.g., Schommer-Aikens, 2002) or specific to them (e.g., Hofer, 2000). Therefore, Schommer-Aikens (2002) has recommended further research in measuring epistemological beliefs and development, including further studies with reliability and validity. Schommer (1993) has also reported that the EQ has predictive validity for academic performance. For example, individuals' high scores on Quick Learning were related to their academic performance: under-comprehension of a text task and over-confidence in that task.

Students responded to the items on the EQ by indicating degrees of agreement with each statement on a Likert-type scale, ranging from a score of one (Strongly Disagree) to a score of five (Strongly Agree). Factor analysis was not used because of the number of subjects, so the recommended method (M. Schommer, personal communication, June, 2002) included grouping students' scores according to factor loading typical of college students consistent with her previous research. This approach was followed, and the instrument is scored so that high scores indicate naïve perspectives, for example, Strongly Agree with "You can believe almost everything you read."

The Writing Attitudes Survey. This instrument, also self-report, measures students' beliefs about writing, including the beliefs about writing as a learnable skill and/or a "gift" (Charney et al., 1994). This measure was constructed and tested by Palmquist and Young (1992) for college students to indicate their beliefs about writing, including indicating their beliefs that writing is a "gift" or a learnable skill, and the researchers reported that the measure has high internal validity for its factors (giftedness, apprehension, self-assessment). In both of the above studies, internal validity was determined by factor loadings from factor analysis (Palmquist & Young, 1992; Charney et al., 1995), with the second study's scores consistent with the first. For both studies, Cronbach's alpha was reported: Learnability (.67), Writing Apprehension (.82), and Writing Self-Assessment (.77) (Charney et al., 1995). T second group of researchers also renamed the "Apprehension" factor to "Enjoyment," explaining that they believed the items reflected enjoyment, rather than apprehension. However, they cautioned that "enjoyment and apprehension are not mutually exclusive emotional states" (p. 308). This more recent version of the instrument was the recommended version used in this research (M. Palmquist, personal communication, July, 2001).

The Writing Attitudes Survey consists of 12 items loading on three subscales, indicating students' beliefs relating to the components of learnability, enjoyment, and writing self-assessment. A typical item from the Writing is Learnable subscale is "Good teachers can help me become a better writer." Writing Enjoyment subscale items include "I enjoy writing" and "Writing is a lot of fun." A typical item from Writing Self-Assessment subscale is "I am a good writer." Students responded to these items by indicating degrees of agreement with each statement on a Likert-type scale, ranging from a score of one (Strongly Disagree) to a score of seven (Strongly Agree). Scores for each item are totaled for the three subscales, with individual student factor scores ranging from 4-28.

Design

This study was constructed as a descriptive study to examine beginning education majors' beliefs about writing and epistemology, as well as their reported self-regulatory behaviors. The study was initiated for gaining better understanding about students' attitudes about writing and learning, and as well as determining if these beliefs were related to self-reglated behaviors in writing tasks. It was hoped that the results from this study would provide the College of Education with knowledge for course instructors to better support students in writing tasks, as well as to lead to continued research in this area.

Results

Means and standard deviations were calculated for all subscales of the three instruments across all participants (see Table 1). Results of students' scores reported on each of the three measures are within typical ranges reported for comparable students in previous research with those measures: Writing Attitudes Survey (cf. Charney et al., 1995); Epistemological Questionnaire (cf. Schommer, 1998); The Metacognitive Awareness Inventory (cf. Schaw & Dennison, 1994).

TABLE 1
Means and Standard Deviations for the Metacognitive Awareness Inventory, Episemological Questionnaire, and Writing Attitudes Survey

	M	SD
Metacognitive Awareness Inventory		
Knowledge of Cognition	98.34	10.26
Regulation of Cognition	93.59	14.94
Epistemological Questionnaire		
Fixed Ability	8.59	2.20
Simple Knowledge	9.22	1.11
Quick Learning	4.10	0.89
Certain Knowledge	2.90	0.51
Writing Attitudes Survey		
Learnability	21.48	4.07
Writing Enjoyment	17.46	5.05
Writing Self-Assessment	16.74	3.95

Beliefs about Writing and Epistemology

The first research question addressed students' epistemology beliefs and their beliefs about writing. Research addressing learners' personal epistemological beliefs has a substantial history (Hofer & Pintrich, 2002). However, Pintrich (2002) has pointed out that research that examines possible relationships between personal epistemological beliefs and domain beliefs, and thinking and learning processes is still in its early stages. He has cautioned against trying "to specify the causal relationships between personal epistemologies and other academic outcomes, such as cognition, motivation, and learning" (p. 406). Therefore, zero-order correlations (Pearson) were first calculated to determine if relationships among students' reported personal epistemological beliefs, writing-related beliefs, and self-regulatory behaviors existed.

Writing beliefs. Several statistically significant relationships were found among subscales of the Writing Attitudes Survey. For example, Writing Enjoyment was positively correlated with Writing Learnability (r = .33, p = .04) and Writing Self-Assessment (r = .60, p = .00) (See Table 2). In other words, students who reported enjoying writing also reported beliefs that writing is a learnable skill, as opposed to a "gift." Furthermore, students who enjoyed writing also reported higher self-perceptions of themselves as writers than students who did not consider writing to be an enjoyable task. These results are in accord with existing research and underscore the importance of motivational factors in the writing process (e.g., Bandura, 1993; Bruning & Horn, 2000; Hammann, 2003; Pajares & Johnson, 1994; Zimmerman & Kitsantas, 1999).

Because Writing Enjoyment had a strong statistically significant relationship with Writing Learnability and Writing Self-Assessment (the other two subscales on the Writing Attitudes Survey), it seemed important to try to tease out the influence of students' perceptions of Writing Enjoyment on other aspects of their writing behaviors and beliefs. Therefore, using Writing Enjoyment scores, I grouped the students into High and Low Enjoyment groups, divided at the median score (cf. Charney et al., 1995). A ANOVA was done, using High and Low Enjoyment groups as the independent variable and Learnability as the dependent variable. However, there was no statistically significant different between high and low Enjoyment groups on the Learnability of writing (F (1, 80) = 3.09, p = .08) (See Table 3). In other words, students in the High Enjoyment group did not report statistically significant different beliefs about Learnability from students in the Low Enjoyment group.

Next, another ANOVA was done, using Writing Self-Assessment as the dependent variable. However, on Writing Self-Assessment, there was a statistically significant difference between the High and Low Enjoyability groups. Students in the High Enjoyment group had higher positive self-assessments as writers than did those in the Low Enjoyment group: F (1, 80) = 19.47, p = .00 (See Table 3). Perhaps students who enjoy writing do so because they believe that they are "good" writers. On the other hand, perhaps students who believe they are good writers enjoy writing and even exert more effort in writing tasks. The directionality of this relationship is a topic for future research.

Epistemological beliefs. Zero-order correlations were calculated between the four factors on the Epistemological Questionnaire and Writing Attitudes Survey (see Table 2). It had been hypothesized that Fixed Ability (EQ) or Quick Learning (EQ) would relate negatively to students' beliefs that writing is a learnable skill, and the relationships were negative ones: Writing Learnability and Fixed Ability, r = -.26, p = .43; Writing Learnability and Quick Learning, r = -.26, p = .35. Contrary to expectations, students'

TABLE 2
Correlations Among Epistemological Questionnaire Factors and Writing Attitudes Survey Factors

	Epistemological Questionnaire				Writing Attitudes Survey		
	1	2	3	4	5	6	7
Epistemological Questionnaire							
1. Fixed Ability	—	.17	.72*	-.02	-.26	-.30	-.01
2. Simple Knowledge		—	.20	.13	.20	.20	.02
3. Quick Learning			—	-.08	-.26	-.15	.04
4. Certain Knowledge				—	.18	-.03	.13
Writing Attitudes Survey							
5. Learnability					—	-.33*	.12
6. Enjoyability						—	.60*
7. Self-Assessment							—

* p < .05

responses did not show statistically significant relationships between their epistemology beliefs and their attitudes toward writing. Possibly the writing-intensive courses which most students had already taken may have influenced their responses. However, two scales from the EQ were significantly related: Fixed Ability and Quick Learning (r = .72, p = .00).

Because these results were contrary to hypothesized ones, a clearer picture of the relationship of students' beliefs with Writing Learnability seemed necessary. Therefore, the next step was determining whether or not students with high Learnability scores reported statistically different beliefs about epistemology factors from students with low Learnability scores. It was decided to divide students into groups, at the median, by their Learnability of Writing scores (WAS) (cf. Charney et al., 1995). Then series of ANOVAs was run, using High and Low Learnability groups the independent variables and the four Epistemological Questionnaire factors as dependent variables. As seen in Table 4, students in the High Learnability group had significantly lower scores on beliefs of Fixed Ability, F (1, 80) = 5.87, p = .02; and also in Quick Learning, F (1, 80) = 5.37, p = .02. In other words, students who did not think that writing was learnable, also believed that ability is fixed and that learning happens quickly (see Table 3).

Writing Beliefs and Self-Regulatory Behaviors

The focus of the second research question was the relationship between preservice teachers' beliefs about writing as a gift or learnable skill and their learning behaviors. In accordance with previous research, Knowledge and Regulation of Cognition (MAI) factors were strongly correlated (r = .79, p = .00) (see Table 4). In other words, students reporting high levels of awareness of their own thinking and learning processes also indicated high regulation of it. In a series of zero-order correlations (Pearson's r) Learnability and Writing Self-Assessment Subscales were non-significant with Knowledge or Regulation of Cognition but were significantly related to Writing Enjoyment (r = .33, p = .00; r = .60, p = .00, respectively) (see Table 4). Again, groups were split at the median in High and Low Enjoyment of writing. However, the only Writing Attitudes subscale significantly correlated with either MAI factor was the Writing Enjoyment Subscale: Knowledge of Cognition (KOC): r = .38, p = .00; Regulation of Cognition (ROC): r = .40, p = .00, respectively. Students who reported that they enjoyed writing also reported higher levels of self-regulatory behaviors: both knowing about, and regulating their own thinking processes (see Table 4).

TABLE 3
Mean Scores of High and Low Learnability Groups on Epistemological Questionnaire Measures

	Learnability			
	Low (n = 42)		High (n = 40)	
Epistemological Questionnaire Measure	M	SD	M	SD
Fixed Ability *	9.15		8.00	
Simple Knowledge	9.44		9.00	
Quick Learning *	4.31		3.87	
Certain Knowledge	2.83		2.97	

* p < .05

Note. High Scores in EQ Factors indicate more naïve perspectives.

TABLE 4
Correlations Among The Metacognitive Awareness Inventory Scales and the Writing Attitudes Survey

	Metacognitive Awareness		Writing Attitudes Survey		
	1	2	3	4	5
Metacognitive Awareness					
1. Knowledge of Cognition	—	.79*	.25	.38*	.15
2. Regulation of Cognition		—	.21	.40*	.09
Writing Attitudes Survey					
3. Learnability			—	.33*	.12*
4. Enjoyability				—	.60*
5. Self-Assessment					—

* p < .05

Writing Enjoyment was a statistically significant factor in Writing Self-Assessment (r = .60, p = .00). However, it was thought useful to determine if students who reported enjoying writing also reported engaging in more self-regulatory behaviors than students who did not enjoy writing. Therefore, using the existing High and Low Enjoyablity groups as independent variables, a set of ANOVAs was run with Knowledge or Cognition, and Regulation of Cognition as dependent variables. There was a statistically significant difference for both Knowledge and Regulation of Cognition between High and Low Enjoyment of writing groups : Knowledge, F (1, 80) = 7.50, p = .01; Regulation F (1, 80) = 8.70, p = .00 (see Table 5). Clearly, students in the High Enjoyment group also reported significantly higher levels of self-regulated behaviors (Knowledge and Regulation of Cognition). Perhaps affective aspects of writing (such as enjoyment, fun) function as mediating forces for learning processes and self-regulatory behaviors (see Table 5).

Self-Regulatory Behaviors and Epistemological Beliefs

The third research question investigated preservice teachers' epistemology beliefs and learning behaviors. As reported previously, the relationship between students' epistemological beliefs for Quick Learning and Fixed Ability (the EQ) were statistically significant (r = .72, p = .00) (see Table 6) 5). Perhaps these students believe that if they do not learn something immediately, then their ability in that area must be low. These individuals may even doubt their own capacities for mastering a topic (e. g. , Garner & Alexander, 1989). In addition, a statistically significant negative correlation was found between students' Knowledge of Cognition (MAI) and Fixed Ability (EQ): r = -.37, p = .01) (see Table 6). In other words, students believing ability is innate also reported low levels of Knowledge of Cognition (MAI).

Discussion and Recommendations

The main goal of this study was to gain a clearer understanding of the relationships among students' writing and epistemology beliefs, and their self-reported self-regulatory behaviors. It was also hoped that clearer knowledge of these relationships, and the importance of them, could serve to inform instructors of pre-service teachers in planning course writing tasks and instruction. Therefore, this study integrated

TABLE 5
Mean Scores of High and Low Writing Enjoyment Groups on Writing Learnability and Self-Regulation

	Enjoyment			
	Low (n = 42)		High (n = 40)	
	M	SD	M	SD
Writing Attitudes Survey				
Learnability	20.71		122.28	
Writing Self-Assessment*	15.05		118.53	
Metacognitive Awareness Inventory				
Knowledge of Cognition*	95.43		101.40	
Regulation of Cognition*	89.05		198.38	

* p < .05

TABLE 6
Correlations Among The Metacognitive Awareness Inventory Scales and Epistemological Questionnaire Factors

	Metacognitive Awareness		Epistemological Questionnaire			
	1	2	3	4	5	6
Metacognitive Awareness						
1. Knowledge of Cognition	—	.79*	-.37*	-.08	-.26	.23
2. Regulation of Cognition		—	-.28	-.14	-.16	.14
Epistemological Questionnaire						
3. Fixed Ability			—	-.17	.72*	-.02
4. Simple Knowledge				—	.20	.13
5. Quick Learning					—	-.08
6. Certain Knowledge						—

* $p < .05$

several key research strands: (a) preservice teachers' beliefs about writing (e.g., Draper et al. 2000; Palmquist & Young, 1992); (b) epistemology beliefs (e.g., Charney et al., 1994; Hofer, 2000; Pintrich, 2002; Schommer, 1990, 1998); (c) self-regulatory behaviors (e.g., Graham & Harris, 1997; Zimmerman & Risemberg, 1997); and (d) investigation in a naturalistic setting (e.g., Graham & Harris, 1997).

There were three research questions: (a) What is the relationship between preservice teachers' epistemology beliefs and their writing beliefs? (b) What is the relationship between preservice teachers' writing beliefs and their self-regulation behaviors? (c) What is the relationship between preservice teachers' self-regulation behaviors and their epistemology beliefs?

The first research question addressed relationships between preservice teachers' beliefs about writing and epistemology. Writing Enjoyment emerged as an important factor in the writing process. Writing Enjoyment was related to both Learnability of Writing and Writing Self-Assessment (WAS subscales). It may be that students who believe writing is a learnable skill enjoy the learning processes that writing evokes. It may also be that students who enjoy writing do so because they believe they are "good" writers. Interestingly, however, correlations among students' epistemology beliefs and writing attitudes were nonsignificant. It had been hypothesized that students who believed in ability as a fixed entity would also have correspondingly low scores on writing as learnable (e.g., Palmquist & Young, 1992). However, when students were divided into groups by High and Low beliefs of Writing Learnability, there was a statistically significant difference between group means on for both Fixed Ability and Quick Learning (EQ). Students in the low Writing Learnability group reported high beliefs in Fixed Ability and Quick Learning. It may be that students who believe ability is "fixed" or that learning must occur quickly may also believe that writing ability is a "gift" (cf. Palmquist & Young, 1992), not a learnable skill. The statistically significant correlation between Fixed Ability and Quick Learning (Epistemological Questionnaire) also supports this finding.

For the second research question, addressing the relationship between preservice teachers' writing beliefs and self-regulatory behaviors (MAI), several points emerged. The relationship between both Knowledge of Cognition and Regulation of cognition were statistically significant, in accord with previous research (e.g., Schraw & Dennison, 1994). Also, students' high scores on both Knowledge and Regulation of Cognition were significantly related to their Writing Enjoyment scores. It may be that students who are self-regulated also enjoy writing more than students who are not. Because writing is a demanding and complex task, requiring high degrees of self-regulatory behaviors (Kellogg, 1987), students' perceptions of Writing Enjoyment may sustain them in necessary self-regulatory behaviors during the writing process.

The third research question addressed possible relationships between students' epistemological beliefs and their self-regulatory behaviors (MAI). Students' Knowledge of Cognition scores and their beliefs in Fixed Ability were found to be negatively related. It may be that students believe ability is a fixed entity because they are not aware of their own thinking processes. Perhaps if students do not believe that they can *learn to learn*, they may not try to become aware of their own cognition. Further research could help to determine if students are not aware of their own thinking processes, or if they even realize that this awareness is within their control.

This study had some limitations. A larger number of students could provide further support for the relationships seen in this study, particularly with regard to writing tasks. Also, the current study was focused on beginning education majors. However, further research could examine these writing-related factors across content areas and course levels.

Two key points emerged from this study. The first point underscores the necessity for instructors' awareness about the influence of students' writing beliefs and the relationship with writing self-

regulatory behaviors (e.g., Schraw & Dennison, 1994; Zimmerman & Bandura, 1994). The second point reinforces the importance of motivational factors in the writing process. Teachers are responsible for creating motivational conditions for writing in a classroom; and instructors' "own conceptions of writing are seen as crucial…" (Bruning & Horn, 2000, p. 1).

The findings from the current study provide support for several recommendations for instructors in planning writing activities, taking into account students' individual characteristics, including personal goals (Lin & Zabrucky, 1998), writing self-assessments (Palmquist & Young, 1992), and self-efficacy (Zimmerman & Bandura, 1994). First, instructors should elicit information about students' writing experiences, learning behaviors, and beliefs. Although few instruments are available to assess writing beliefs, other research-validated measures exist exists that can provide instructors and their students with valuable information about self-regulation behaviors, for example, The Motivated Strategies for Learning Questionnaire (MSLQ), and The Learning and Study Strategies Inventory (LASSI) (cited in Winne & Perry, 2000); The Metacognitive Awareness Questionnaire (MAQ) (as cited in Sperling, 1997). For epistemology beliefs in addition to the Epistemological Questionnaire used in this study, measures include the Epistemic Belief Inventory (EBI) and the Reflective Judgment Interview (RJI) (cited in Hofer & Pintrich, 2002). In addition, instructors should encourage students to examine their beliefs about writing and learning, and the relationships of these beliefs with their behaviors (Mallette et al., 2000). Then this information should be used to plan course writing tasks and instruction. For example, instructors should present writing as a learnable skill, providing explicit instruction of writing strategies and procedures along with opportunities for mastery (e.g., Hammann, 2003; Harris & Graham, 1996; Palmquist & Young, 1994). Instructors also should guide students' self-reflections to encourage attribution to their own effort and appropriate strategy use (Alderman, 1995; Ames, 1992) instead of some elusive "giftedness."

Second, writing tasks should be within students' capabilities, and instructors should provide explicit writing strategy instruction to support students' self-regulation, include goal-setting and scaffolding (e.g., Armbruster, Anderson, & Ostertag, 1987; Harris & Graham, 1996; Johannessen, 2001; Langer, 2001; Radamacher & Latosi-Sawin, 1995; Zimmerman & Kitsantas, 1999). Students who have knowledge of writing strategies have powerful cognitive and metacognitive strategies to support them in their learning, strategies that support them in the challenge of "what to say" and "how to say it" (e.g., Bereiter & Scardamalia, 1987). For example, in summary writing, the instructor could begin by asking students what a summary is, why it is useful; then teach summary rules, and planning steps, even providing a summary planner, as they scaffold students to mastery in the writing task (Hammann & Stevens, 2003).

Third, instructors must be aware of the powerful role of motivational factors, such as students' perceptions of themselves as writers and the role of self-efficacy in writing tasks (Zimmerman & Bandura, 1994). For example, the pre-service teachers in this study who enjoyed writing also had higher self-assessments of themselves as writers than did those students who did not find writing enjoyable. Their enjoyability of writing was also significantly related to their beliefs that writing is learnable. For example, students who have been taught text organization strategies have shown increased awareness of writing to communicate with someone, including heightened awareness that reading and writing are connected processes (Raphael & Englert, 1990; Gordon, 1990a). Perhaps students who are more aware of own their thinking as they write also value writing as a means of communication, self-expression, and constructing knowledge.

Fourth, engaging writing tasks can support students in making their own meaning of course concepts and providing them with the opportunity to think like future teachers (or historians or scientists) themselves (Bereiter & Scardamalia, 1987; Draper et al., 2000; Mallette et al., 2000; Penrose & Geisler, 1994). Results from the study indicated that student with high levels of writing enjoyment also reported high levels of cognitive involvement. For example, in an educational psychology course, pre-service teachers can be asked to compare and contrast the theories of Piaget and Vygotsky and apply these concepts to their future learners in a content area and grade level. These practices may support students in the challenging transition between being student writers and being part of a community of other professionals.

Instructors who have a clear understanding of their own and their students' beliefs about writing, learning, and self-regulation have the potential to produce new teachers or scientists or historians with strong writing skills who write and communicate effectively in their learning communities. The task we face is challenging, but essential and attainable.

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