

**AUTHENTICATED WRITING COMPETENCIES OF
AGRICULTURAL EDUCATION GRADUATE STUDENTS:
A COMPARISON OF DISTANCE AND ON-CAMPUS STUDENTS**

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Abstract

The quality of graduate student writing was examined in two different courses offered both on and off the campuses of Texas A&M, Texas Tech, and Oklahoma State Universities. In all, 19 on-campus and 25 off-campus students participated. A neutral third-party designed the instrument and used content analysis techniques to analyze writing samples. Data from the content analysis were summarized by the authors using descriptive and inferential statistical techniques. The location of the student, whether on- or off-campus, was not significant in explaining writing ability. Of the students sampled, 7% were able to demonstrate adequate writing; 34% achieved a score that suggested that their writing ability may be adequate; and 60% either suggested or demonstrated inadequacy in their writing ability. When given this structured writing task, and using this single measure, 93% of graduate students in this sample were unable to demonstrate complete proficiency in writing.

Introduction

Distance education has historically taken advantage of advances in communications technologies. The dramatically short product development cycles in modern multimedia communication technologies are creating new opportunities in the design and implementation of technologically mediated learning environments at an unprecedented rate.

In most preceding distance delivery strategies, the only medium available for student-generated communications has been the written word. Modern communication technologies have made it possible to provide students with additional media channels. The telephone has been available for over 100 years, audio tape recorders and video cameras have been widely available for decades, and now H.323 desktop videoconferencing is diffusing rapidly throughout our schools. None of these

technologies has made significant progress in replacing the written word as the preferred communications medium for student-generated communications. Nor do the authors believe they will. The latest technologies, from Instant Messaging (IM) to Blogging, rely on written expression. The written word, regardless of how it is transmitted and published, will remain the dominant medium for student-generated communications in educational settings for the foreseeable future.

“Learning at a distance is fraught with unique challenges” (Miller & Pilcher, 2002, p. 34). The Boyer Commission (1998) reported, “The best teachers and researchers should be thinking about how to design courses in which technology enriches teaching rather than substitutes for it” (p. 2). As the demand on faculty increases to make their courses available off-campus, the need to analyze the competencies necessary for student success and satisfaction in these

environments grows more urgent. Competence in writing is fundamental for success in distance education environments.

Lindner, Dooley, and Murphy (2001) found differences in the self-reported writing competence levels of two groups of distance learners in graduate programs in Texas. Recognizing the limitations of self-reported data, they recommended others "conduct authentic assessment of student competencies through testing" (p. 38). This study responded to their recommendation by assessing the writing competence of graduate students in two on-campus and three off-campus graduate degree programs.

Theoretical Framework

Russell (1998) provided a metaanalysis of more than 240 studies indicating that in properly designed learning environments, the methods employed to overcome geographical or chronological distance produced no significant differences in learner achievement. Although achievement may be unaffected by these methods, learner satisfaction has been found to be related to interaction. Learners prefer a setting that includes interaction between and among other learners and instructors (Fulford & Zhang, 1993; Garrison, 1990; Ritchie & Newby, 1989). One way to organize thinking about interaction is through the theory of transactional distance.

Moore (1980) introduced the concept of transactional distance. Moore and Kearsley (1996) suggested that transactional distance be included as a variable in the analysis of distance education courses and programs. Transactional distance is a measure of distance, not as a geographical but as a "pedagogical phenomenon" (p. 200). It involves the interplay among the instructors, the learners, the content, and the learning environment. Distance is described in terms of the responsiveness of an educational program to the learner, rather than in terms of the separation of the instructor and the learner in space or time or both. According to Moore and Kearsley, there is always some transactional distance involved in a learning environment—even when the students are collocated with the instructor. By this measure, some on-campus course designs

have greater transactional distance, and are in fact more distant, than some courses designed to use technology to overcome geographical and temporal separation.

Parraton's (1988) list of 14 hypotheses forms a theory of distance education. Pertinent to this study are her first and 12th hypotheses. The first is, "You can use any medium to teach anything," and the 12th is, "Feedback is a necessary part of a distance learning system" (p. 37). The importance of interaction through communications, particularly in those environments where communications are mediated through technology, has long been stressed by Moore (1983, 1980, 1973). In many theories of learning, education is a specialized organization of communications (Flanders 1970; Friedrich 1982). Certainly, communications are central to any learning environment and the focal point of any distance learning delivery strategy.

High-quality written expression may in fact be more essential to minimizing transactional distance in learning environments that separate instructors and learners in space and time. Hawisher and Moran (1997) found that text-based electronic dialogues tend to be rapid, informal, and public. Students need to be able to write with sufficient clarity to overcome the lack of non-verbal cues, and they may be required to do so without the luxury of time afforded to traditional students. Students retain more information learned with writing-to-learn techniques than with traditional teaching methods (Reaves, Flowers, & Jewell, 1993). Job success may also be dependent on oral and written communication skills (Sprecker & Rudd, 1997, 1998).

Regardless of the amount of geographical distance present in a course design, much of the interaction used to reduce transactional distance will occur through the written word. This study addressed the fundamental question of how well graduate students are able to communicate through the written word. In a study of agricultural education doctoral students' competencies, Lindner and Dooley (2002) found that doctoral students perceived growth in their writing abilities as they progressed through the program.

Recognizing the limitations of self-reported data, these authors recommended that students' abilities be assessed using authentic assessments.

Purpose

The purpose of this study was to establish baseline data for the evaluation of the writing ability of on- and off-campus graduate students in agricultural education programs at three universities. The objectives of the study were to:

1. Describe on-campus and distance graduate students' competence to write an argument essay.
2. Assess differences in graduate students' authenticated writing score by location of student.
3. Assess differences in graduate students' authenticated writing score by institution of student.
4. Describe differences in graduate students' authenticated writing score, within writing competency category, by location.

Methods

Content analysis techniques were used to analyze writing samples from 44 graduate students (Fraenkel & Wallen, 1996). The students were enrolled in two different courses at three different universities. This study examines distance as a component in writing proficiency, and is one part of a larger examination of writing proficiency in these three graduate programs (Lindner, Murphy, Wingenbach, & Kelsey, 2004).

A course entitled *Advanced Methods in Agricultural Education* was delivered to 15 on-campus students from Texas A&M University, while 17 students were simultaneously taking a separate section of the same course at a distance through a joint degree program with Texas Tech University. The second course, offered by Oklahoma State University, was entitled *Research Methods in Agricultural Education*. There were 12 students enrolled in this course (4 on- and 8 off-campus). Because of the nature of the data collected and potential for negative impact on participants, the

Institutional Review Board suggested that data be collected anonymously. Personal characteristics of participants were, therefore, not collected.

The instrument used to gather data was designed by the Department of English's Writing Programs Office (WPO) at Texas A&M University. The researchers identified the articles to be read and helped prepare the instructions and APA documentation guidelines. The authors considered using the GRE Writing Assessment (GRE, 2003) because of its nationally-normed reliability, but wanted the level of detail available from a sentence level structure assessment. The GRE Writing Assessment provides only an overall assessment of analytical writing.

The instrument used in this study consisted of two articles, instructions, and APA documentation guidelines. All students were given two articles discussing the role of computing technology in K-12 classrooms. One article presented arguments in favor of using technology in the classroom (Pea, 1998), and one presented arguments against (Cuban, 1998). The instructions directed students to write a well-formed, grammatically correct essay based on their reading of the two position papers; write this essay in the form of an argument; consider the audience to be graduate students; begin with an overview; use references in the essay following APA guidelines; and proofread and correct their papers before submitting them for analysis. The APA documentation guidelines provided students with information on how to reference citations and to use quotations.

All students were provided a copy of the articles and an informed consent document one week in advance of the writing activity. Students were instructed to read, mark-up, and think about the articles before coming to the next class. Students were told that they would be writing essays based on the articles; they knew nothing in advance about the format or structure of the writing activity. Upon entering the testing situation (in-class or synchronously using video conferencing), students were given oral and written instructions, APA documentation guidelines, additional copies of the articles if

needed, and two bound and blank writing journals often called "bluebooks."

Before beginning the writing assessment, students were instructed to spend 15-20 minutes outlining and drafting their argument paper into one of the bluebooks, and then to spend 40-55 minutes writing, and 10-15 minutes proofing their final paper into the second bluebook. Students were directed to carefully read the written instructions. Students had 90 minutes to complete the writing assignment. All students ($n=44$) completed the writing assignment and submitted their finished essays.

Bluebooks were collected by the researchers and delivered to the Director of the Writing Programs Office at Texas A&M University for analysis (Gibson, n.d.). The researchers contracted with the Writing Programs Office to hire two professionally-trained evaluators to score each essay using an overall writing strength rubric and a sentence-level structure assessment rubric. There were four possible scores on the overall writing strength rubric. These were as follows: 4=demonstrates adequacy; 3=suggests adequacy; 2=suggests inadequacy; and 1=demonstrates inadequacy. Evaluators reached consensus on each student's overall writing strength.

The sentence level structure assessment rubric consisted of six writing competency categories (coherence, audience awareness, argument, summary, sources, and grammar) that contained numerous specific writing competencies (see Tables 1-6). Coherence was defined as the development of a clear thesis and introduction that sets the stage for the argument and well-constructed paragraphs in the body of the text. Audience awareness was defined as the ability to write on an appropriate level for an identified audience and make appropriate appeals using correct tone and voice. Argument was defined as the development of a supported and logical argument about an issue with important consequences for both author and audience. Summary was defined as the development of a clear summary, drawing on the established argument and references. Sources were defined as the appropriate use of references in the paper following APA guidelines. Grammar was defined as the

ability to write a grammatically correct essay.

The Writing Programs Office has a sustained positive reputation for scoring student writing tests using both the overall and sentence-level structure assessment rubrics. Reliability and validity had been previously established (Ashe, 1994). The instrument has been shown to predict students' success in later assessments of writing. In establishing predictive validity, 95% of the students who received a passing score (as judged by the Writing Programs Office) also passed the National College Level Examination Program (CLEP) Composition Test. Reliability was established by comparing the variability within an evaluator's score ($r=.84$), in scoring between pairs of evaluators ($r=.76$), and in scoring across all students over time ($r=.83$) (Ashe). Evaluators' scores tended to remain constant over time. To ensure inter-rater reliability, evaluators must agree on a student's overall writing strength assessment. Sentence-level assessment was based on the individual evaluator's judgment. Evaluators did not have to agree on a student's sentence level assessment.

These data were gathered from three groups of students taking individual sections of one of two courses. The researchers recognize the sampling limitations of using intact classes. Caution is warranted against generalizing these findings beyond the sample. Additional research is needed to support the generalizability of findings and recommendations. The instrument for this study was field tested by the Writing Programs Office for content and face validity. Inter-rater reliability ($r=1.0$) was established by having evaluators reach consensus on each student's overall writing strength assessment. Data were analyzed using SPSS to produce appropriate descriptive and inferential statistics.

Findings and Conclusions

Objective one was to describe graduate students' competence to write an argument essay (Table 1). The professional evaluators reached consensus on each student's score. Using the overall writing strength rubric, the

scores of four students (9.1%) demonstrated inadequacy in writing an argument essay. The scores of 22 students (50.0%) suggested inadequacy in their competence to write an argument essay. Fifteen students (34.1%) had scores that suggested

adequacy, and three students (6.8%) had scores that demonstrated adequacy in their competence to write an argument essay. There were no significant differences between on- and off-campus students for this variable.

Table 1
Authenticated Writing Scores for On-campus and Distance Learners

	Total (n=44)		On-campus Learners (n=19)		Distance Learners (n=25)	
	f	%	f	%	f	%
Demonstrates Adequacy	3	6.8	0	0.0	3	12.0
Suggests Adequacy	15	34.1	7	36.8	8	32.0
Suggests Inadequacy	22	50.0	11	57.9	11	44.0
Demonstrates Inadequacy	4	9.1	1	5.3	3	12.0

The second objective was to assess differences in graduate students' authenticated writing score by location of student. Overall, students tended to demonstrate inadequacy ($M = 2.39$) in writing an argument essay. There were no statistically significant differences

between on- and off-campus learners' writing scores, $t(42) = .54, p > .05$. Based on these authenticated writing scores it was concluded that on-campus and distance learners had similar writing competence. These data are summarized in Table 2.

Table 2
Comparison of On-campus and Distance Learners by Authenticated Writing Score (n=44)

Writing Competency	n	M	SD	t	p
Distance Learners	25	2.44	.87	.54	.59
On-campus Learners	19	2.32	.58		

Note. Scale: 1=demonstrates inadequacy, 2=suggests inadequacy, 3=suggests adequacy, 4=demonstrates adequacy; $M = 2.39, SD = .75$; A small effect size, $d = .17$ was calculated.

The third objective of the study was to describe differences in graduate students' authenticated writing score by the institution in which the student was enrolled. Students tended to have similar writing scores regardless of institution (Table 3). There

were no statistically significant differences between students' authenticated writing scores when tested between institutions, $F(2,41) = .73, p > .05$. It was concluded therefore that students' authenticated writing scores did not differ between institutions.

Table 3
Comparison of Authenticated Writing Score by Institution (n=44)

Institution	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Texas A&M University	17	2.41	.94	.73	.73
Texas A&M and Texas Tech Universities ^a	15	2.27	.59		
Oklahoma State University	12	2.50	.67		

Note. Scale: 1=demonstrates inadequacy, 2=suggests inadequacy, 3=suggests adequacy, 4=demonstrates adequacy; $M = 2.39$, $SD = .75$; A medium effect size, $f = .13$ was calculated.

^a Doctoral degree offered jointly by both institutions.

Objective four was to describe differences in graduate students' authenticated writing score within writing competency category by location. Using the sentence-level structure assessment rubric previously discussed, students' writing tests were assessed against six competency categories (coherence, audience awareness, argument, summary, sources, and grammar) that each contained numerous specific writing competencies.

Students, on average, were deficient on 32% of the items used to measure the six competency categories (Table 4). On-campus and distance learners tended to have similar deficiencies. Students demonstrated the most deficiency in the competency categories argument (17%) and coherence (16%). There were no statistically significant differences between on-campus

and distance learners by argument, $t(42) = .81$, $p > .05$, and coherence, $t(42) = .42$, $p > .05$. The next most deficient competency categories were grammar (12%), summary (11%), and audience awareness (10%). No statistically significant differences were found between on-campus and distance learners by grammar, $t(42) = .74$, $p > .05$, summary, $t(42) = .11$, $p > .05$, and audience awareness, $t(42) = 1.70$, $p > .05$.

The competency category in which students demonstrated the fewest number of deficiencies was sources (3%). No statistically significant differences were found between location and sources, $t(42) = .91$, $p > .05$. It was concluded that student writing scores within the six competency categories did not differ by whether they were on-campus or distance learners.

Table 4
 Comparison of Writing Competency Category by Location (n=44)

Competency Category	<i>n</i>	<i>M</i> ^a	<i>SD</i>	<i>t</i>	<i>p</i>
Argument —Development of a supported and logical argument about an issue with important consequences for both the author and the audience					
Distance Learners	25	.15	.12	.81	.42
On-campus Learners	19	.18	.12		
Grand Mean ^b	44	.17			
Coherence —Development of a clear thesis and introduction that sets the stage for the argument and well-constructed paragraphs in the body of the text					
Distance Learners	25	.17	.12	.42	.68
On-campus Learners	19	.15	.09		
Grand Mean ^c	44	.16			
Grammar —Ability to write a grammatically correct essay					
Distance Learners	25	.13	.15	.74	.47
On-campus Learners	19	.10	.12		
Grand Mean ^d	44	.12			
Summary —Development of a clear summary that draws on the established argument and references					
Distance Learners	25	.11	.11	.11	.91
On-campus Learners	19	.12	.10		
Grand Mean ^e	44	.11			
Audience Awareness —Ability to write an essay on appropriate level for identified audience and make appropriate appeals using correct tone and voice					
Distance Learners	25	.07	.11	1.70	.10
On-campus Learners	19	.13	.12		
Grand Mean ^f	44	.10			
Sources —Uses appropriate references in the essay following APA documentation					
Distance Learners	25	.02	.05	.91	.37
On-campus Learners	19	.04	.07		
Grand Mean ^g	44	.03			

^a*M* = .32, *SD* = .21. ^bA medium effect size, *d* = .25 was calculated. ^cA small effect size, *d* = .14 was calculated. ^dA small effect size, *d* = .15 was calculated; ^eA medium effect size, *d* = .46 was calculated. ^fA large effect size, *d* = .51 was calculated. ^gA medium effect size, *d* = .28 was calculated.

Discussion and Recommendations

This study has advanced the knowledge base concerning writing ability for on-campus and distance students in these three nationally-recognized graduate programs in Agricultural Education. Although we celebrate the 7% who demonstrated adequate writing and the 34% whose score suggested adequate writing ability, we lament the 60% whose scores either suggested or demonstrated inadequate writing ability. The authors recognize the limitations of using a single measure for such a complex construct, but in this single measure 93% of graduate students were unable to demonstrate adequate writing techniques when given a structured writing task with ample preparation. There were no significant difference in writing competence based on the location of the student, whether on-campus or at a distance.

Moore's theory of transactional distance (1980) grounded this study. If students are able to surmount the technological barriers to interaction through electronic communications technologies, they will have a more satisfying and meaningful experience in the graduate program. It is implied, however, that students have the basic skills required to be successful after they navigate through the technology, namely the ability to communicate via the written word. Given this assumption, this study sought to understand graduate students' writing proficiency as a fundamental core competency for success in a graduate program. Without excellent written expression abilities, transactional distance will increase in both environments. To overcome limitations in verbal visual communications imposed by technology, technologically mediated learning environments rely on written communications to a greater extent than do traditional face-to-face environments. Important in all graduate programs, writing proficiency is critically important for the success of graduate programs offered through technologically-mediated learning environments.

The authors were disappointed by the writing adequacy scores produced in this study, but not surprised. Writing

competency among graduate students has been a topic of discussion among the faculty at all three universities, yet faculty members have reported feeling powerless to improve writing competency among graduate students. This study is a positive first step toward understanding the problem and working with students to improve their writing proficiency. Using the methodology outlined in this study, agricultural educators can diagnose students' writing ability upon entry into the graduate program and prescribe a writing improvement strategy that can be implemented over time to advance the overall writing skills of students. It should be the student's responsibility to seek out tutoring to improve writing skills, but motivation, encouragement, evaluation, and ultimately accountability should come from the student's dissertation adviser.

Parraton (1988) advocated faculty feedback as a necessary element of successful teaching. Providing feedback regarding students' writing as well as misunderstanding of content is critical for helping students to improve writing skills. Most agricultural educators are excellent at providing content-related feedback to students, but many shy away from correcting students writing for various reasons, insecurity with grammar rules being one. Feedback does not have to be at the level of citing exact grammar usage, but rather can be as simple as placing a check mark next to an incorrect sentence and asking the student to review and improve that sentence. This technique empowers students to seek out the error for themselves and reinforces self-learning.

Additional research needs to be conducted to explore new ways to respond to and correct student writing in distance education environments. Hawisher and Moran (1997) suggested that responding to students' writing online using comments in text may not evoke the same response from students as margin comments and error markings on printed pages.

This study provides some evidence that these three graduate programs in Agricultural Education could do more to assist students in the area of writing proficiency. Recommendations for practice

include strengthening the relationship with the writing centers at each campus and providing graduate students with additional resources and incentives to improve their writing proficiency.

The authors recommend that additional studies to assess writing proficiency be undertaken in other on- and off-campus graduate programs of agricultural education to determine if this regional finding can be generalized nationally. Additional data would determine if students in this sample represent the norm for agricultural education graduate students nation-wide. For such a nation-wide study, the GRE Writing Assessment (GRE, 2003) may be preferable with advantages in cost, ease of use, and national norming data.

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