

A Case Study of Using Electronic Self-Assessment Rubrics in a Core Curriculum Writing Course

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Abstract

Writing is a necessary skill for graduates of colleges of agriculture. The purpose of the non-experimental, case study, guided by Bandura's theory of self-efficacy (1986, 1994, 1997), was to describe the use of self-assessment electronic rubrics in a university core curriculum writing course at Texas A&M University in the College of Agriculture and Life Sciences. Findings revealed that students' ability to accurately assess their score using an electronic rubric increased during the semester. Additionally, students' perceived and rubric-guided scores for all four constructs—Idea and Content Development, Style, Organization and Conventions—increased throughout the semester. Over time students' perceived and rubric-guided scores were within 0.56 points of each other indicating that students became better assessors of their own writing and more confident in their writing abilities. More research needs to be done on how instructors of university core curriculum writing courses can use self-assessment to enhance the learning process and help students understand writing as a process.

Introduction

Writing competence is a necessary skill in the 21st century. The Office of Undergraduate Studies at Texas A&M University (2011) has claimed that students will graduate with the oral and written communication skills they need to communicate effectively. However, the National Commission on Writing (2003) presented a differing point: Writing education is ignored and not considered an integral part of the classroom environment. "*American education will never realize its potential as an engine of opportunity and economic growth until a writing revolution puts language and communication in their proper place in the classroom*" (p. 3).

Universities and colleges admit students who do not have proficient writing skills as defined by the 2007 National Writing Report Card (Salahu-Din et al., 2008) while employers' communication needs are becoming greater (Peddle, 2000). This leaves an even larger gap between the writing abilities of students entering college and the needs of employers and graduate programs—students exiting college and entering the workplace or pursuing graduate education. Yet, universities and colleges (e.g., Marymount University, Tulane University, University of Missouri, Texas A&M University and Colorado State University) continue to require students to enroll in writing courses in an effort to improve written communication skills.

Assessment is an important component of the teaching and learning process and has the potential to improve instruction and student learning, but educators often times have the wrong mindset about why and how to assess students (Guskey, 2003). Limited time and resources can restrict instructors' ability to teach and assess students' writing abilities (Andrade, 2008; Cho and Schunn, 2010). Assessments should be used as a tool to gain an understanding of what the students know so information can be clearly explained (Guskey, 2003). Writing is a process learned through consistent writing, assessment and feedback (Cho and Schunn, 2010; White, 1991); it is more than rules (White, 1991).

Writing can be assessed using a variety of formative and summative assessments including self-assessment (Andrade, 2008; Boud, 1991; McDonald and Boud, 2003). Andrade (2008) claimed feedback is an important part of formative assessment and just as valuable when given by the students themselves if the right conditions exist. Boud (1991) stated self-assessment is the process of students judging their own work based on criteria

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presented by the course instructor. It is more than grading; it is evaluating writing on the basis of knowing what good writing is (Andrade, 2008). Although Kitsantas et al. (2004) stated “self-evaluation is a valuable learning tool” (p. 285) that could enhance students’ performance, attitudes and self-efficacy, Andrade and Boulay (2003) found self-assessments did not improve students’ writing. The latter authors believed, however, that facilitating revisions based on the criteria presented in the assessment and summoning students’ help in designing the assessment could lead to more effective writing programs and develop reflective writers.

Using self-assessment gives students an opportunity to identify and recognize what they need to work on and improve (Andrade, 2008; Bruce, 2001). Students who assess their own work can identify and correct mistakes before completing an assignment (Kitsantas et al. 2004). Self-assessment exercises help students perform better than their counterparts who do not participate in self-assessment exercises (Kitsantas, et al. 2004).

Conceptual Framework

Bandura’s theory of self-efficacy (1986, 1994, 1997) provided conceptual guidance for this descriptive case study. According to Bandura (1997), self-efficacy is defined as the “beliefs in one’s capabilities to organize and execute the course of action required to produce given attainments” (p. 3). Additionally, self-efficacy is influential in a person’s choices, efforts, perseverance, actions, resilience, thoughts, reactions and achievements (Bandura, 1986). Writing is about the process through which students develop confidence in their ability but not about the product or the end result (White, 1991). Mastering experiences helps students feel more confident in themselves and their abilities (Bandura, 1994).

Students entering their collegial years are transitioning from pedagogy to andragogy where self-directed learning begins (Knowles et al., 2005; Merriam, 2001). Self-efficacy is an essential component in the transition from childhood to adulthood, development of adults and achievement of success (Bandura, 1994). In each stage of development, humans should begin to take responsibility for their lives, successes and challenges (Bandura, 1994). Kitsantas et al. (2004) found that self-evaluation had a positive impact on students’ self-efficacy. Students gain a deeper understanding of themselves and of their strengths and weaknesses during the self-assessment process (Bruce, 2001) and that understanding is an important part of the realization of themselves and self-directed learning (Merriam, 2001). Students who are not satisfied with their educational outcomes within a certain area may be reluctant to pursue more opportunities in that area because of their

fear of failure or negative impacts (Kitsantas et al. 2004). In addition, students’ confidence in themselves and their abilities can be linked to instructor’s feedback (Nicholson et al. 2011).

The classroom has transitioned from a teacher-centered environment to a more student-centered (Catalano and Catalano, 1997), self-directed (Merriam, 2001) learning environment. Further, separating good information from bad information (Brew, 1999) and disseminating knowledge through oral and written communication channels are necessary skills in the 21st century workforce, government and society (National Writing Commission, 2003). Because of the lack of evidence to support Texas A&M University’s (2011) claim that students will graduate with effective oral and written communication skills, the researchers chose to conduct a case study that explored self-assessment in a writing course.

Purpose/Objectives

The purpose of the case study was to describe the use of a self-assessment electronic rubric in a university core curriculum writing course at Texas A&M University in the College of Agriculture and Life Sciences. Three objectives guided this study:

1. Describe students’ rubric-guided score and perceived score and an instructor-assessed score;
2. Compare students’ rubric-guided score to their perceived score for each construct on each assignment; and
3. Describe students’ perceived levels of confidence for each assignment.

Method

This non-experimental case study sought to describe the use of self-assessment rubrics in an upper-level, core curriculum writing course at Texas A&M University in the College of Agriculture and Life Sciences. AGCJ 404 – Communicating Agricultural Information to the Public, taught in the Department of Agricultural Leadership, Education and Communications, is a senior-level, university core curriculum course that fulfills the requirement of a writing course at Texas A&M University. Sixteen students enrolled in the course for fall 2011, represented a variety of majors, including those outside of the College of Agriculture and Life Sciences. The case study was approved by the Texas A&M University Institutional Review Board to ensure the rights and protection of human subjects.

Electronic Writing Rubric

The self-assessment rubric was adapted from Texas A&M University for the Writing Assessment Project and

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converted to an electronic format by the researchers so the assessment link could be distributed 48 hours before the due date of the assignment. The rubric consisted of four constructs: Idea and Content Development (0 to 18 scale), Style (0 to 24 scale), Organization (0 to 24 scale) and Conventions (0 to 14 scale). Each construct was measured at four levels—developing, sufficient, proficient and exemplary. Within each level were statements that described the construct at that level. Each construct had varying numerical values because of the numbers of statements within each level and variation of construct importance. Each statement within the constructs was assigned a numerical value of one. If the statement was a double-barreled statement (Ary, et al., , 2010), the statement was divided into two statements for clarification, each receiving a numerical value of one. If the students perceived they had met the criteria outlined in the statement, they would select “yes” and be directed to the next level of that particular statement. If they selected “no,” they would be directed to the developing level of the next statement. The statement values were calculated and reported as the students’ rubric-guided score for each construct.

The rubric was considered content valid because it was extensively vetted and adopted by the Writing Assessment Project. Students with similar characteristics who were not selected to participate in this study were included in a pilot test of the rubric. The group of students independently assessed the same assignment using the electronic rubric. They were provided step-by-step instruction on how to complete the rubric and were instructed to ask for clarification of any unclear procedures.

Internal consistency was addressed using estimates of reliability as described by Spearman (1910) and Brown (1910), generally expressed as

$$r_{sh} = \frac{2r_{12}}{1 + r_{12}}$$

in which r_{12} represents the correlation between the two halves of a scale. When a scale is artificially split into equivalent halves that measure the same behavior based on content, the resulting correlation should be high and positive. Data collected during the pilot test using the electronic rubric were included in the estimates of internal consistency (split-half reliability), resulting in a reliability coefficient of .85.

Because instructor scoring was included in analyses, inter-rater reliability needed to be addressed. According to Ary, et al., (2010), inter-rater reliability can be determined when two or more trained observers independently complete the same test producing a positive and high reliability coefficient ($\geq .90$).

Two instructors who had previously taught the course independently completed the electronic rubric assessing the same assignment. The Spearman (1904) rank correlation coefficient r_s , a nonparametric procedure for correlation of ranks, was used to estimate inter-rater reliability using the instructors’ rubric-based scores. The rank correlation coefficient is generally expressed as

$$r_s = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$$

where n is the number of measurements in each of the two variates in the correlation and d is the ranked distance between the measurements for the two variates (e.g., rank1 – rank 2). The results indicated a positive and high correlation ($r_s = .92$; $p = < .05$) between the instructors’ assessments.

Procedure

Students were asked to complete a self-assessment for six writing-intensive assignments throughout the semester: journal assignment, technical memorandum, press release, business letter, application letter and résumé and technical report. The journal assignment was a two-page document designed for students to summarize a journal article that they would later use as part of their research for the technical report. The technical memorandum assignment, designed to teach students how to write and format a memo, was a one-page document that summarized their topic and audience for the technical report. The press release assignment was a two-page document used to teach students how to inform the public about a specific event or product. The business letter assignment was a one-page document designed for students to learn how to write and format a standard business letter. In addition, students were asked to complete an application letter and résumé, which was different from the business letter assignment. The application letter was a one-page standard business letter and the résumé was a one-page document that highlighted the students’ education, professional experience and skills. The technical report was a six-page (minimum) research report about a topic of the students’ choice and included multiple steps in the development process. The final document was submitted as a hard copy and presented to the class in a 10-minute oral presentation; the presentation was not included in the scoring of the assignment.

For all assignments, students were expected to take on the role of a technical writer. Students were asked to use the electronic rubric to self-assess each assignment before submitting it, but the self-assessment was not mandatory. As suggested by Andrade (2008), self-assessments were not included in students’ scores

because, when self-assessments are included in scores, the assessment becomes an evaluation that can lead to students' negative opinions. The 16 students participated in the self-assessment activity. Of the 16 students, 14 assessed themselves on assignment one, 12 on assignment two, 13 on assignment three, nine on assignment four, 11 on assignment five and 11 on assignment six. Not every student completed a self-assessment for each assignment, but each student completed a self-assessment at least one time during the semester. Before beginning the self-assessment exercise, the instructor discussed self-assessment and the rubric with the students. As part of the course, the instructor taught the students material related to each construct of the rubric. For example, a set amount of class time was devoted to grammar and punctuation, whereas another part of the class included idea and content development.

Although the content for each assignment differed (e.g., technical memorandum vs. technical report), all assignments were assessed using the same rubric and construct scales, which measured students' competency in each of the rubric's four constructs. The analyses compared the individuals to themselves on a longitudinal series of performance measures. This approach was appropriate because the analyses were "... based on patterns of individual and group differences in assessment outcomes rather than content differences..." (Willingham, et al., 2002, p. 3).

Students were asked to estimate or assess their score on a percentage basis for each construct in the rubric and for the overall assignment. Each measure—perceived vs. rubric-guided—was independent. After completing the assignment and before completing the self-assessment rubric, students were asked to report their perceived performance on the assignment with a score of 0 to 100. For example, if a student believed he or she earned a B for a specific construct in the rubric, he or she would estimate a percentage ranging from 80 to 89 percent. This was the students' perceived (PER) score reported in the results.

Students navigated through the electronic rubric and assessed themselves based on the criteria established for each of the four constructs. For each assignment, students' individual construct scores were combined to create composite scores, yielding one student rubric-guided (RG) composite score and one instructor-assessed (IA) composite score. At the end of each self-assessment, students reported the level of confidence (0 to 100 scale) in their writing ability on that particular assignment. For example, if a student was not at all confident in his or her writing ability on a particular assignment, he or she would estimate a score near or at zero. Conversely, if a student was certain of his or her writing ability, he or she

would estimate a score near or at 100. Disaggregating scores by construct allowed for description of students' confidence at a more finite level. Level of confidence was assessed because students' self-efficacy (Bandura, 1986, 1994), which impacts confidence, is related to their ability to achieve and master new tasks. The scores derived from this level of confidence score represented students' perceived level of confidence.

Each assignment was assessed independently of the other assignments. For assignment six, technical report, students were asked to submit formative assessments throughout the development of the report: topic and audience, empirical sources, topic outline and rough draft. In addition, students wrote a rough draft and attended mandatory student/instructor meetings to discuss their assignment. Students served as peer reviewers (Brew, 1999; Cho and Schunn, 2010) for two of their classmates, as well.

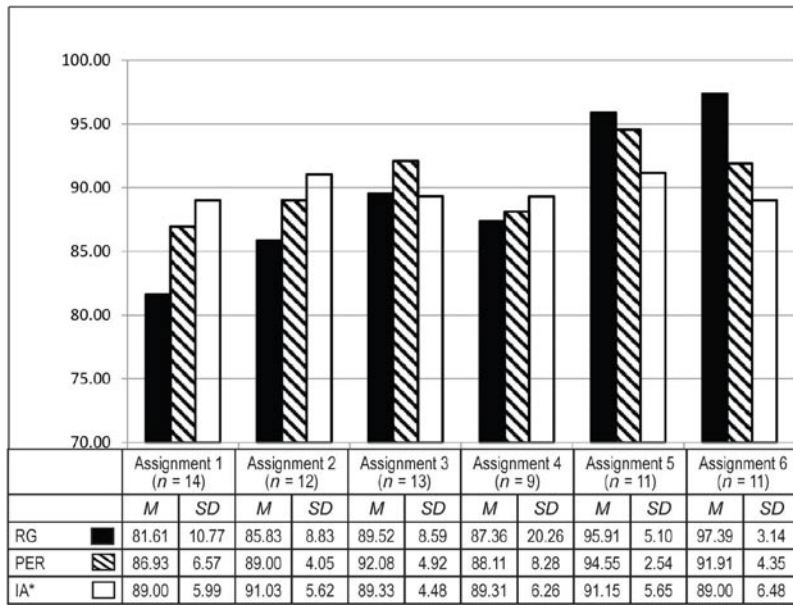
Data were analyzed using SPSS® version 20 to determine frequencies, means, standard deviations and reliability coefficients. Ideally, a multivariate analysis of variance would be used to compare the variables of interest—RG, IA and PER scores. However, the case study nature of this study and the limited sample size, ranging from 11 to 14 students per assignment, did not produce data that were not parametrically amenable or sufficiently large ($n \geq 30$) enough to conduct parametric tests. Only frequencies, means and standard deviations will be reported to describe the scores. Moreover, the results of this study cannot be generalized to a larger population.

Results

Objective One

For objective one, students reported their overall RG score and PER score on a scale of 1 to 100. The IA was also on a scale of 1 to 100. With the exception of assignment four (business letter), students' RG score increased from assignment one ($M = 81.61$, $SD = 10.77$) to assignment six ($M = 97.39$, $SD = 3.14$). Students' PER score increased from assignment one ($M = 86.93$, $SD = 6.57$) to assignment three ($M = 92.08$, $SD = 4.92$). The IA score fluctuated between assignments but remained between 89.0% and 91.5%. Students' RG score ($M = 89.52$, $SD = 8.59$) most closely aligned with the IA score ($M = 89.33$, $SD = 4.48$) on assignment three. Whereas, students' PER score ($M = 89.11$, $SD = 8.28$) most closely aligned with the IA score ($M = 89.31$, $SD = 6.26$) on assignment four (See Figure 1).

Figure 1



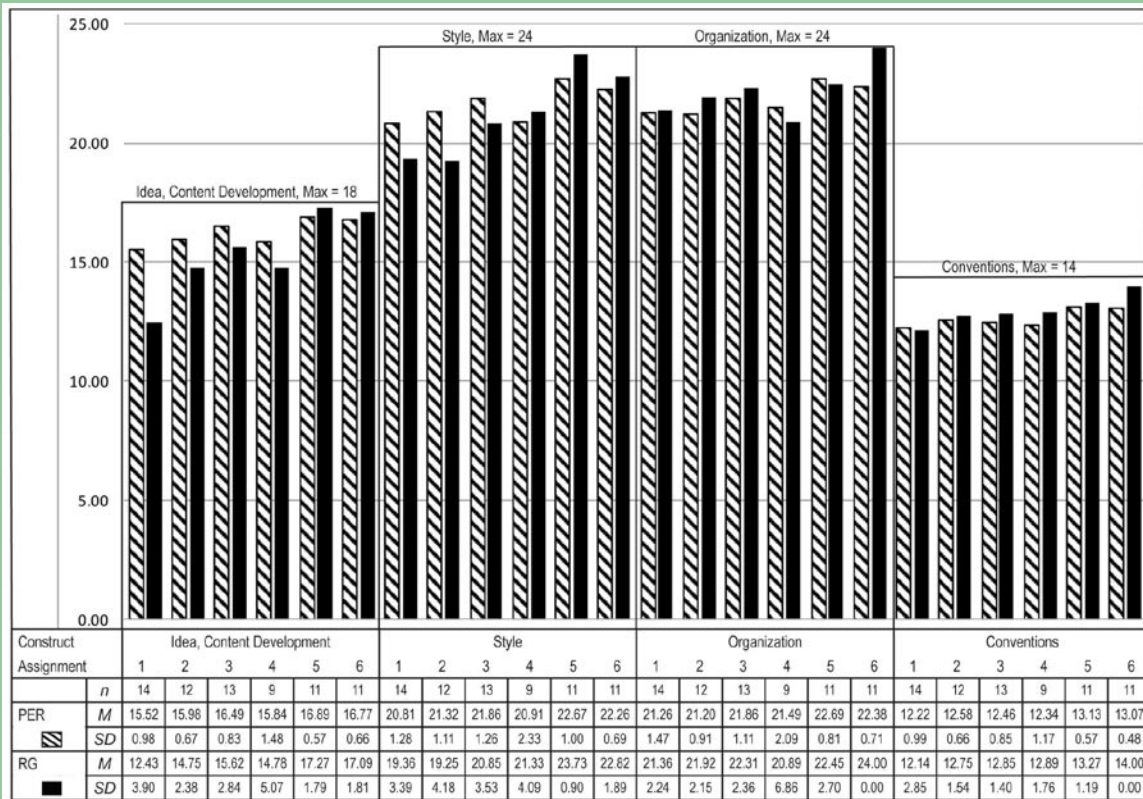
Mean percentage scores for students' overall rubric-graded (RG) score, perceived (PER) score, and *score earned (IA) (n = 16). RG score is the score students calculated using the electronic rubric. PER is the score students thought they earned prior to completing the rubric. IA is the score students received from the instructor.
 1 = journal assignment; 2 = technical memorandum; 3 = press release;
 4 = business letter; 5 = application letter and résumé; 6 = technical report.

Objective Two

For objective two, students' RG score and PER score were compared for each construct. Students' PER score for Idea and Content Development slightly increased from assignment one (M = 15.52, SD = 0.98) to assignment three (M = 16.49, SD = 0.83), whereas students' RG score increased by more than three points from assignment one (M = 12.43, SD = 3.90) to assignment three (M = 15.62, SD = 2.84). Over time, students' PER score and RG score for Idea and Content Development increased from assignment one (PER, M = 15.52, SD = 0.98; RG, M = 12.43, SD = 3.90) to assignment six (PER, M = 16.77, SD = 0.66; RG, M = 17.09, SD = 1.81).

Students' PER score for Style increased from assignment one (M = 20.81, SD = 1.28) to assignment three (M = 21.86, SD = 1.26) while students' RG score increased between assignment three (M = 20.85, SD = 3.53) and assignment five (M = 23.73, SD = 0.90). Overall, students' PER and RG score for Style increased from assignment one (PER, M = 20.81, SD = 1.28; RG, M = 19.36, SD = 3.39)

Figure 2



Mean scores for students' perceived (PER) and rubric-graded (RG) for *Idea and Content Development*, *Style*, *Organization*, and *Conventions* of each assignment. RG score is the score the students calculated using the electronic rubric. PER is the score students believed they earned prior to completing the rubric. 1 = journal assignment; 2 = technical memorandum; 3 = press release; 4 = business letter; 5 = application letter and résumé; 6 = technical report.

to assignment six (PER, M = 22.26, SD = 0.69; RG, M = 22.82, SD = 1.89).

Students' PER score for Organization fluctuated between assignment one and assignment six with the lowest mean associated with assignment two (M = 21.20, SD = 0.91) and the highest mean associated with assignment three (M = 22.69, SD = 0.81). However, with the exception of assignment four, students' RG score increased between assignment one (M = 21.36, SD = 2.24) and assignment six (M = 24.00, SD = 0.00). Overall, students' PER score and RG score for Organization more closely aligned with assignment one (PER, M = 21.26, SD = 1.47; RG, M = 21.36, SD = 2.24) than assignment six (PER, M = 22.38, SD = 0.71; RG, M = 24.00, SD = 0.00). Students' PER score for Conventions was steady with less than a one point increase at any point during the semester, whereas students' RG score increased during the semester from assignment one (M = 12.14, SD = 2.85) to assignment six (M = 14.00, SD = 0.00). Students' PER score and RG score for Conventions remained within one point of each other on all six assignments (See Figure 2). Additionally, the correlation between PER scores and RG scores—0.42 to 0.72—indicated students' ability to accurately assess their work without the aid of a grading rubric increased as the semester progressed.

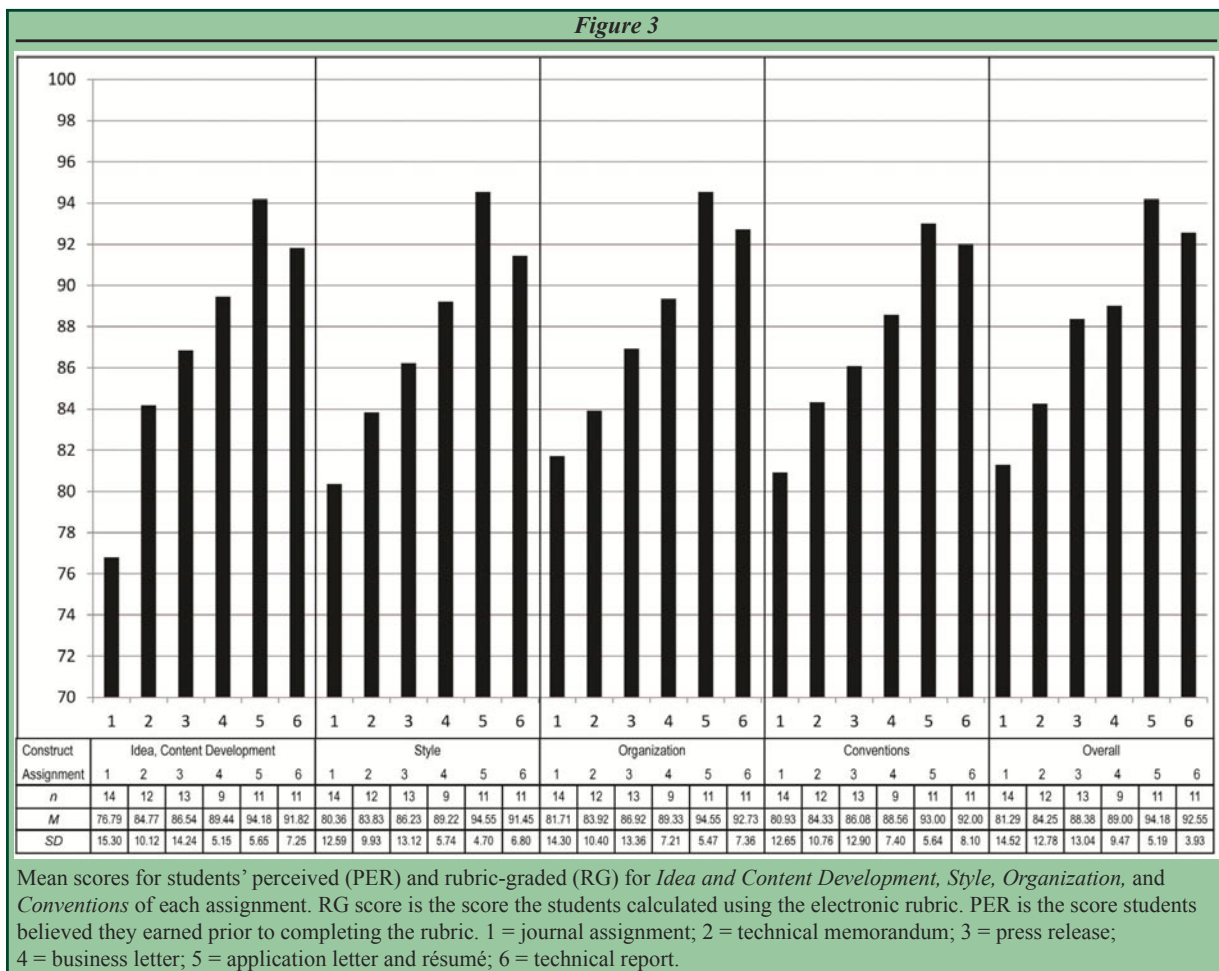
Objective Three

For objective three, students reported their perceived level of confidence in their writing ability for each assignment on a scale of 1 to 100. With the exception of assignment six, students' perceived level of confidence increased for Idea and Content Development, Style, Organization and Conventions on each assignment. Overall, students appeared to become progressively more confident in their writing ability with the exception of assignment six (See Figure 3).

Discussion

Writing instructors and assessors realize that some students respond better to different types of assessment. If instructors continue to use assessment to label writing as correct and incorrect (Guskey, 2003), students will likely miss the principle and most important part of writing—the process (White, 1991). Because students' PER score and RG score more closely aligned at the end of the semester, students' scores indicated they could more accurately assess their ability to write without using a rubric.

Students' RG score most closely aligned with the IA score on assignment three, press release and their PER score aligned with the IA score on assignment



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four, business letter. Students' RG scores increased throughout the semester, but the IA score remained consistent between 89% and 91.5%. Students' PER score and RG score for all four constructs—Idea and Content Development, Style, Organization and Conventions—increased. Students became more comfortable in assessing their writing using an electronic rubric and assigning themselves a score. Students who participated in self-assessment exercises played a more active role in their learning process. Instructors should not be the sole provider of feedback and assessment, and self-assessment can help relieve that stress from instructors (McDonald and Boud, 2003).

According to Andrade (2008) and Bruce (2001), using a rubric helps students understand what elements are needed to produce quality writing and improve their writing based on the feedback received through the self-assessment. Using self-assessment forces students to read and review their work before turning it in. Students do not always take the time to review summative assessment, but with self-assessment they can be involved in the process of improving their learning. When students are forced to reconsider their work and make judgments based on set standards, they have the opportunity to reflect on their writing and make necessary changes, which aligned with Andrade (2008), Bruce (2001) and Kitsantas, et al. (2004).

Further, students' PER and RG scores for Conventions steadily increased over time, whereas confidence scores showed fluctuation between assignments. As White (1991) noted, students are accustomed to a set of rules and think once they learn the rules their writing will improve. If students believe writing is a set of rules, it is obvious students would be more confident assessing their Conventions abilities because over time they would learn grammar, punctuation and spelling rules.

Between assignments three and four the scores dropped for each construct. The researchers concluded students' lack of ability and confidence in their ability to write business letters were the reasons for lower scores. Also, the business letter assignment was due mid-semester when students could have been overwhelmed and pressured with other courses and course assignments. Based on this study, students became more confident in their writing, with the exception of assignment six and more aware of their strengths and weaknesses based on assignment scores. Students' PER score and RG score were within 0.56 points of each other. Therefore, concluding that students became better assessors of their own abilities and more confident in their writing abilities, which was arguably in line with Bandura (1986, 1994, 1997).

Self-assessment, as used in the study, would be considered summative assessment in relation to the assignment and formative assessment in relation to the course. To better facilitate self-assessment, more training should have been provided to the students. Students should be taught specifically how to use assessment to better themselves and their work because incorporating self-assessment training into the “curriculum provides [students] a way of laying the foundation for the kinds of skills students will need as lifelong learners after school” (McDonald and Boud, 2003, p. 219).

Educators should continue to use self-assessment in their writing intensive courses because self-assessment enables students to become critics of their work and lifelong, effective and responsible learners (McDonald and Boud, 2003). As students piece together the elements of writing and move through the writing process, they begin to understand, assess and evaluate good writing, as suggested by Andrade in 2008. Self-assessments could help increase students' ability to take responsibility for their education by providing a self-delivered learning activity. The electronic self-assessment used in the study disassembled the assessment component and provided students an opportunity to ensure they addressed each component of the assignment. Self-assessment could shift the classroom from a teacher-centered environment to a student-centered (Catalano and Catalano, 1997) environment where students focus on the writing process instead of the end result (White, 1991).

This descriptive study sought to describe self-assessment when used in a core curriculum writing course. Based on the results of this study, self-assessment should be explored more. More in-depth studies should be conducted to determine the effectiveness of using self-assessment in agriculture. More research needs to be conducted on how instructors of university core curriculum writing courses can use self-assessment to enhance the learning process and help students understand writing. “If students produce it, they can assess it; and if they can assess it, they can improve it” (Andrade, 2008, p. 63). By using self-assessment in writing education, students can assess their own level of performance and achievement (Bandura, 1986, 1994, 1997; Kitsantas, et al., 2004) and improve their writing abilities (Guskey, 2003). Further, research needs to be conducted to determine if there are differences between using self-assessment in university core curriculum writing courses and major-specific, writing-intensive courses. An experimental or quasi-experimental study could be conducted using two sections of the same course taught by the same instructor to determine if differences exist between atypical formative self-assessment (Andrade, 2008; Boud, 1991; McDonald and

Boud, 2003) and typical summative assessment (Brown, 1999; Trotter, 2006).

These types of studies are the first phase of developing strong writing assessment programs that could be used nationwide across multiple disciplines in colleges of agriculture. The findings of the study cannot be generalized to other populations because the study describes one course at one university. However, the findings can be used as a basis to compare to future writing assessment studies in agriculture. Similar, yet, more in depth randomized experimental design studies can be conducted comparing the findings of this study. Colleges of agriculture could implement an assessment program specific to each field of study that could revolutionize writing education and assessment as suggested by the National Commission of Writing (2003). Before higher education can encourage higher-level skills in application, analysis, synthesis and evaluation, a new level of assessment needs to be developed (Brown, 1999). Carefully designed and implemented self-assessments could be one piece to an in-depth assessment program.

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