Writing as a Tool for Teaching and Evaluating Student Performance

In University Level Course Work

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Abstract

This paper addresses the need for writing as a component of every discipline, and the value writing has for both the students and the instructors. The paper presents an historical background of composition in higher education and the rationale behind using writing as one of the methods of educating the students at ERAU. The need for writing and its value as an educational tool in even the most technical of disciplines are explored. The paper attempts to answer three questions that plague instructors when considering the addition of a writing component to a content course:

1. Why do I need to add writing, since my course is technical, theoretical, or hands-on?
2. With all the work I am doing, when can I find time to deal with a written assignment?
3. How can I possibly teach, evaluate, and grade something else, when it seems irrelevant to what I am teaching?

Included are implementation of strategies, management of time, styles of writing, suggested assignments, and performance evaluation/grading/assessment advice for both formal and informal, graded and un-graded written assignments, along with sample writing criteria.
We do not think and then write, at least not without putting an unnecessary handicap on ourselves. We find out what we think when we write, and in the process put thinking to work-and increase its possibilities.
-Frank Smith (1982)

Introduction
Embry Riddle Aeronautical University professors are dedicated to the goals set forth by the university: "...to provide a comprehensive education that prepares graduates for productive careers and responsible citizenship to support the needs of aviation, aerospace engineering, and related fields" (ERAU Graduate Catalog, 1998-1999 p. 7). Degree programs focus on varied aspects of the aviation industry, generally with a technological emphasis in both undergraduate and graduate programs. Along with the technical courses, the core programs include several composition courses. Those of us who teach writing courses are fighting a battle to facilitate our students' communicating through the written word. We seem to be losing that battle. We cannot do it alone, so we need to look to other members of the faculty to provide the missing components of this struggle to present Standard Written English as a means of communication and to provide another avenue for student learning, while using writing in different academic settings.

Historical Background
Written communication, today, is one of the bedrocks of our society. Cave walls were adorned with figures representing meaning; parchment served to record what we now consider valuable information; paper continues to provide a trail of important ideas; the computer has usurped the spotlight as the major tool for recording the written word. Writing has not always been a part of our major means of communication. Before the 1870s, oratory was a primary focus in education. Schools and universities concentrated on training students in rhetoric and public speaking, for recitation was the standard. Writing activities centered solely on classroom note taking. If someone spoke "correct English," he or she was regarded as having the capacity to present a high standard of written literacy. Unfortunately, many students who were judged on their writing skills did not measure up to the standards expected of their professions or social class (Russell, 1991).

When university education became more practical and more easily obtainable, universities engaged in research and began to hold campus-wide oral and written examinations graded by faculty, collectively, or by outside assessors. Writing grew to be regarded as a skill independent of content learning. Gradually, as universities developed and grew in complexity, composition courses were accepted, but there were no provisions for college-wide
writing outside those composition courses. Junior faculty and teaching assistants assumed responsibility for the writing courses, and no other faculty participated in the perpetuation of the skills students acquired in the dedicated composition classes. Styles of writing included class notes, laboratory reports, research papers—all which placed significant value on discovery and factual evidence, thus devaluing the "the written form of intellectual discourse" (Russell, 1991). Students and faculty focused on academic writing that presented content and ignored the context of the writing with regard to audience and purpose, thus not allowing for differences in the ways disciplines presented the content.

During the Progressive Era, education developed into a more utilitarian institution and viewed the goal of writing instruction as a means to provide skills needed to follow instructions and develop the relationship between the writer, reader, subject, and point of view. Following World War II, knowledge exploded and multiplied, accelerating the pace of change (Russell, 1991). With the advent of the Information Age, writing became viewed as less important. Short emails and instant messages seem to have usurped the letter writing and instruction delivery of the recent past. That is where we are today. Academia seems to have no shared vocabulary and no forums for dealing with discipline-specific writing instruction.

The Problem

We, as faculty of Embry-Riddle Aeronautical University (ERAU), can easily find ourselves inundated with student papers (often unworthy of our reading time), particularly if our courses require multiple writing assignments; therefore, many instructors shy away from making written assignments in classes of a technical nature. Therein lies the problem: Without adequate practice and refreshing of writing skills, students in university level courses are inadequately prepared to deal with the written word, when it is a required means of communication.

As a technical institution, ERAU has the reputation for preparing its students to successfully enter the employment realm in their respective, specialized aeronautical areas. Students are required to major and minor in various fields, as well as complete the core requirements for a liberal education. Numerous courses are available, some mandatory, some elective, as part of the Humanities Department, including several writing courses. During these classes, students focus on a variety of writing skills, which, unfortunately do not always transfer to other areas of their educational experience.

The Need for Writing in the Disciplines

A major need exists to help alleviate that situation. Writing teachers cannot "go it alone." Every instructor, regardless of subject content needs to become a writing teacher, as well. This can easily be
Writing as a Tool for Teaching and Evaluating Student Performance

accomplished if all instructors build into their assignment and grading plans the opportunity for all students to continue writing. It can stimulate dialogue between the student and the instructor, particularly in a large class. The importance of this addition to all curricula cannot be overestimated. To hold students accountable for their written assignments will enable the instructors to enhance their own educational productivity and improve written assignments throughout the university.

Three major concerns often surface with regard to one's adding a writing component to any course:

1. Why do I need to add writing, since my course is technical and hands-on?
2. With all the work I am doing, when can I find time to deal with written assignments?
3. How can I possibly teach, evaluate, and grade something else, when it seems irrelevant to what I am teaching?

Question 1: Why do I need to add writing, since my course is technical, theoretical, or hands-on?

Rationale

Although writing serves many cognitive purposes, it primarily serves as a mode of learning. According to Janet Emig (1997), writing in all content areas trains students to think about a topic, internalize the topic and reach their own conclusions, thus causing them to analyze, compare, and synthesize relevant facts and material. Students often view knowledge as the acquisition of correct facts and information, when, in reality, true knowledge is dynamic and requires a "complex combination of potential solutions arrived at through critical thinking" (Schmidt). There is a significant link between critical thinking and writing. Students can develop intellectual and cognitive abilities when thinking about important problems that form the center-point of a writing assignment. Once they begin writing, they engage in expanding, clarifying, formulating and deepening their thinking. As quoted in Schmidt, J.C. Bean states, "When we make students struggle with their writing, we are making them struggle with thought itself." Writing assists students in learning content more effectively by communicating the knowledge, regardless of discipline.

Writing is a tool, not only for learning, but also for discovery. Unfortunately, writing has been used as an end product or a demonstration of something that has been learned. This type of writing is considered the product-centered model and the prove/approve model (Griffin, 1983). Writing, according to the Writing Across the Curriculum (WAC) model, is both a process and a product, which integrates the use of eye-hand coordination and involves both hemispheres of the brain. This process enables the student to formulate and connect ideas that he or she can transmit to
others, but can transmit to the learner through the use of higher order cognitive skills necessary for critical thinking (Emig, 1977). Students better focus and understand subject matter; therefore, those who write in the content area often produce better written products with the practice writing affords. Although the writing certainly may not be the primary objective, it is definitely a result (Miller, 1991). According to a three-year study by Judith Langer and Arthur Applebee, funded by the National Institute of Education, "...the more that content is manipulated through writing, the more it is likely to be remembered and understood" (Langer, J. 1992, p. 130).

Regardless of discipline, writing has a place in each curriculum. WAC is a student-centered pedagogy, not a single movement or a trend, in which all disciplines value writing, rather than considering it an additional burden. Writing is a significant part of learning and serves as a binding force between the creation and acquisition of knowledge (Russell, 1991). Hence, along with teaching content, the instructor becomes a writing coach who can help students organize, synthesize, evaluate facts, and communicate in such a way as to demonstrate learning in that particular discipline, within the conventions of the written word. Since higher education institutions do not just provide instruction, but produce learning, passive learning becomes active discovery, exploration, and invention (Schmidt). Writing often has some of its best applications in disciplines such as physics and mathematics, where students need to learn to think through and evaluate problems, thus becoming one of the most powerful tools students can use to learn how to organize their thoughts, decide what is important, and enable them to know what they really know (Cooke, 1991; Heyman, n.d.).

Question 2: With all the work I am doing, when can I find time to deal with a written assignment?

Time Constraints

You, the instructor, are probably wondering about the paper load you think will be added to your already full schedules. You are probably thinking that you are not English teachers and do not want to do our job. Yes, student writing can be very time consuming, but you need not allow it to be when teaching your classes. Yes, it will take away from your limited time in class, but only in a very minor way. Adding writing assignments in content-driven courses is difficult, especially when students resist anything they see as being unrelated to course content. You must wonder if it is worth the effort? Rest assured, it is!

In just a few minutes, with appropriate writing activities, you can gain valuable insights about problems your students may be having with content, about what they do or do not understand, about how they feel regarding certain issues. This can help you make decisions about how to proceed with...
Writing as a Tool for Teaching and Evaluating Student Performance

your content or what you may need to review. You will not be teaching writing, but you will be using it to help your students learn the content. You do not need to know how to correct student errors, as you will be responding to content. If you do respond to errors, you need not necessarily correct them; your response to errors represents the value you place on writing and the quality you expect from your students. You need to be able to understand what they are trying to tell you. If you expect more, you will receive more!

When students know you value the written word, they will extend themselves to make their ideas clearer and more comprehensive, not forcing you to do the work of perceiving what they are trying to say. Require students to write multiple drafts. The writing process can be accomplished outside of the classroom. Request rough drafts of all written work; that will cut down on plagiarism. You need not read their rough drafts, but a minute to glance holistically over a paper will give you enough insight regarding the students' accomplishments. Require drafts submitted at an appropriate time before the paper or assignment is due. You will be aiding the student in time management, as well as receiving your assignments when due.

There are many ways to insert writing into your schedule without taking much of your time and energy. First, ask yourself what you want the students to learn from your assignment. Your learning objectives, frequently articulated on the basis of Taxonomy of Educational Objectives: Cognitive Domain (Bloom et al, 1956), can be used to establish how you wish to assess what you want your students to accomplish.

Example: Lower order cognitive thinking- knowledge of the topic
Higher order cognitive thinking- solution to a problem, evaluation of class discussion

You will find that students learn key concepts and understand material more fully when they write about the content. They think about the topic and internalize it in order to reach their own conclusions, which they can express more clearly and more thoroughly. Often, after presenting a new concept and asking for questions from the class, you may be facing blank stares. Consider asking the students to write what they understand you to have taught. You may discover the student who is shy about speaking up in class will express his or her confusion in a more private way, more willing to admit a lack of understanding through writing.

An action research study in 1989, by Miller and England, found that allowing students to write five minutes in four out of five instructional sessions did not interfere with the curriculum content over an academic semester. In fact, the writing may have helped the instructors cover the material more effectively (Miller, 1991). Class time is precious, and every instructor
is loathe to introduce something that seems to usurp teaching time, but writing may help to make your class time more valuable for both you and the students. Writing can add to the richness of your course; you cannot afford not to give your students the opportunity to write.

Question 3: How can I possibly teach, implement, evaluate, and grade something that may seem irrelevant to what I am teaching?

Teaching

Regardless of the discipline in which you teach or the course objectives you seek to achieve, writing can easily play an important part of the content of your course. You need not teach writing, although a brief (10 minute) review of some basics (such as APA format) would make life easier for you if you do assign papers. A quick mini-lesson can alert your students to "fragmentitis," a disease that stunts the growth of sentences and ideas. Many can hear their problems if you encourage them to read aloud what they have written. You will be using writing to help your students listen to what they know and learn your subject matter, while you can assess any difficulties. You will be giving your students an opportunity to ask for help and become more aware of what they do not know. Promote correct spelling, punctuation, and grammar from all students.

Implementation

Implementation fully depends upon your content and your course objectives. Some general ideas include journals, free-writes, short reaction papers, generic or focused summaries, lab journals, response papers, learning logs, letters, pre-test warm-ups, analyses of events and processes, project notebooks, discussion starters, using cases, annotations, etc. You can turn a lesson into an inquiry session by having students write ideas that intrigued them or confused them in a chapter or class discussion. Asking a student to prepare a set of instructions or an explanation of a task, recently learned, regardless of the technical nature, will help you assess his or her level of understanding. Students can write procedures and product or equipment descriptions, definitions of concepts, explanations of technical instruments, or short position papers (Haydel 2001). In a class that involves computations, if students write clearly about the concepts, they probably understand them. Writing about how students approach computations allows them to think more sharply, thus revealing a comprehensible understanding of a process (Emig, 1977; Miller, 1991).

Impromptu Writing

Impromptu writing prompts (starter phrases, ideas, concepts) constructed by the professor, regardless of the subject matter, solicit written responses to specific problems or questions as a valuable teaching tool. You may want to solicit clear explanations of a concept, skill, or generalization.
Writing as a Tool for Teaching and Evaluating Student Performance

1. Set a time limit for any in-class writing assignment. Stick to it (three minutes, five minutes).
2. Prepare the impromptu topic in advance.
3. Be flexible. Sometimes a "teachable moment" relates to something unplanned. Seize the moment and use that idea for an impromptu topic.
4. Since students seem to write better if they know they are writing for a particular audience. Establish the audience in advance (i.e. peer, supervisor, administrator).
5. Have the writing take place at the beginning of the class to serve as a transition into your subject.
6. Have students write at the end of class to assess their understanding or impressions.
7. Write with the students. Write a response to the prompt from the professor's point of view (if appropriate).
8. Discuss the purpose of the writing experience (perhaps to serve as a more effective learning tool), so the students will not expect anything other than intrinsic rewards.
9. Do not penalize students when they do not write. Writer's block hits all of us at times.
10. Initial writings may be brief and meaningless at first. Be patient and give students an opportunity to develop the skill and reap the benefits of writing in your discipline.


"Think on Paper" Strategy
1. Explain the purpose of the writing before assigning the paper
2. Focus on depth of thinking and quality of ideas.
3. Spend as little as five minutes on the actual writing.
4. Use this to precipitate class discussion.

Micro-themes

Micro-themes serve many purposes and have numerous advantages. They require significant thinking time, but little text. This snapshot into students' thinking processes maximizes student learning and minimizes instructor-grading time. Four styles of micro-themes are highly productive: summary writing, thesis/support, data description, and quandary posing.
1. This mini-essay can range from a few sentences to a few pages. It may extend from serving as a learning tool as a way to summarize lecture highlights, to accessing student questions, or generating class discussion.
2. This activity enables students to become active class participants.
3. Microthemes can be so short they can be typed on one 5" X 8" note card. An example is an article summary in fewer than 200 words.
4. Use this format as preliminary, exploratory writings.

5. Microthemes usually are not graded. They can also become the basis for more formal, thesis-governed academic writings that are graded (Schmidt).

When requiring a formal technical proposal, laboratory report, discipline-based academic report, several suggestions will help you avoid student difficulties.

Suggestions for Presenting Formal Reports:

1. Be clear about your expectations. Present all instructions in writing. Advise the student of the purpose of the written assignment.

2. Establish a specific audience for the paper to direct the student to appropriate terminology and format.

3. Explain the kinds of sources you expect (differences between primary and secondary sources, annotated bibliographies).

4. Use the idea of the writing process that includes composing (drafting and outlining ideas, establishing a working hypothesis) drafting, revising, editing.

5. Explain the conventions of an academic product and what you expect (parenthetical references, bibliography, APA style—it has recently changes, so you will have to update yourself).

6. Set up your criteria before the assignment and alert the students to your grading policy. Make students aware of the value you place on their writing, and generate a concern for correct Standard Written English. Build the writing clarity and correctness into your grading policy, or students will not value their writing skill.

7. Provide samples of excellent and not-so-excellent papers, so students can see what to do and what not to do.

8. If possible, allow students to submit drafts for perhaps a peer evaluation session before the final paper is due and encourage students to revise their writing.

You will probably find it preferable to assign several short pieces of writing rather than one long one. If you ever have time (doubtful), try one of your own writing assignments. You might discover some surprises about your expectations. Consider the objectives of your course and tailor the assignments accordingly. Sequence your assignments, beginning with something students know how to do; then build others based on previous assignments (Walvoord et al, 9, 14). Allow students to do un-graded exploratory writing to help them develop ideas that can be used to further discussion. Include in an exam a previous "quick write" that had been done in class, to show the value of thinking on paper.
Some Validating Studies:

Several studies validate the success of writing across different disciplines throughout the United States.

1. George Mason University in Virginia reports the following: Business statistics students who kept journals averaged 10 percent better in their final exams than those who did not (Miller 1991).

2. Montana State University reports: Eighty-eight percent of students surveyed thought writing had helped them understand physics (Miller, 1991).

3. Rutgers University in New Jersey reports: Math students who verbalized their difficulties in writing were often able to understand problems they could not solve before. (cited in Miller, 1991, Madigan's "Writing as a Means, Not as an End")

4. A study by Stout, Wygal, and Hoff (1990) of Rider University, revealed many professors enhanced the writing skills of their financial accounting students by emphasizing the importance of writing correctly and required them to maintain journals and complete a small-group formal writing assignment.

5. Hall and Tiggeman (1990) required their students in an introductory finance class to write short, frequent, informal assignments which improved students' understanding of finance concepts and enabled instructors to better assess their students' comprehension (Miller 1991).

6. Toyota Motor Manufacturing, USA, expects all its employees to write one-page reports using graphics (Carnes, 2001).

7. A survey of 52 engineering firms revealed that "writing proficiency is a major factor in deciding the promotional potential of an engineer" (Sully, 1995).

The essence of writing assignments, regardless of length, depth, and formality provides our students with an opportunity to learn how to solve problems, examine ideas and support them with evidence, incorporate and synthesize information, and transmit clearly to others. Language proficiency fosters economic and social opportunities.

Performance Evaluation/Grading

A common complaint by professors of every discipline in every educational institution focuses on grading overload. Now, with the added responsibility of instituting writing in your course, you are probably shuddering about adding a new grading component. You can establish something as simple as the following: If you cannot understand what the writer is saying, lower the grade by the number of points you deem appropriate. Always establish your grading policy when you make your assignment to include Standard Written
Remember, you need not grade every writing assignment. Decide in advance as to the purpose of the writing and alert your students to the value you place on each aspect of the product. Put every item and its value in writing.

**Evaluating a Formal Paper for a Grade:**

1. You can easily skim to understand context; this avoids your asking questions, which may be clarified on later pages.
2. Don't edit the student's work. Select one paragraph or one page and identify spelling errors and grammar problems. Write a note telling the student the rest needs cleaning up and editing.
3. Look for the important points that you have established in advance. Be an active reader by underlining items you feel are appropriate or placing checks in the margin adjacent to the items.
4. Point out strengths in the content as well as weaknesses or gaps.
5. If you cannot understand an idea, ask questions that reveal why you are confused. Often, the writing or misuse of words and punctuation causes the confusion. Alert the writer to what you see (Cooke, 1991; Haydel, 1987).
6. You can establish a step-by-step method where you present students with dates for submission of segments of the assignment. In that way, you can reduce the burden of reading a lengthy work. Suggested activity:
   a. Students may submit an hypothesis/study question or rationale, depending upon the assignment. This may take the form of the paper's introduction and be graded.
   b. Students turn in outline of ideas and annotated bibliography.
   c. Students may submit final draft of body for grade.
   d. Students present final draft of conclusion for grade.
7. Develop an evaluation checklist that identifies what you are looking for in the assignment. Be sure to include readability in the list and assign points for lack of clarity and understandability.
8. Base the grade on previously announced criteria. Weigh each criterion appropriately.
9. Assign a grade that reflects the document's usefulness in the real world or the world you have established for the assignment. Has the document achieved its objectives?
10. Provide feedback concerning the content. Look for positives as well as negatives.
Writing as a Tool for Teaching and Evaluating Student Performance

Simplified Evaluations of Writing Assignments

You can conquer the grading overload by following several suggestions that will simplify the evaluation process:

1. Keep assignments brief. You may find that one or two paragraphs may be as effective as one or two pages.

2. Do not be an editor. Students will not learn if the work is done for them.

3. Build in a self-evaluation component to an assignment. Allow the student to assess his or her own work.

4. Don't be concerned if you cannot identify the writing problem. If it does not sound right, it probably is not. Just note it as a problematic section of the assignment. Lack of clarity blazoned upon a paper sends a message to the student.

5. Develop a peer evaluation session. Present students with pre-designed forms to be turned in with the assignment. Use pairs to evaluate one another's work with respect to your instructions and criteria.

Un-graded Writing

Writing need not be graded. Do not respond or grade informal writing, but comment on the content. Drafts need not be graded, but they should be assessed according to content requirements. You can use writing as part of your evaluation process, yet not as a separate grade. Un-graded writing can serve as an informal assessment of student understanding, which will give you a clearer picture of areas that need remediation. There will be occasions where you do not need to write comments to a student; you can say something to the entire group or to a specific student, allowing the students to know that you read their writing. Your form of response is secondary to the concept that you are providing feedback.

Treat much of the student in-class writing as exploratory work, thinking on paper. Resist the attempt to judge too much. You can select several anonymous papers and read them aloud to the class, as examples of your expectations. Comment on common patterns and interesting ideas; pose questions not explained by the writing, Use this as an informal way to get information from students about the ideas that need reviewing or expanding.

Suggested Evaluative Comments for Student Writing Assignments

Two types of comments are most relevant to students' written assignments, atomistic comments and holistic comments. Atomistic refers to grammatical, punctuation, diction, mechanical, vocabulary, and spelling errors. Holistic refers to organizational problems, clarity of ideas, confusion of concepts, illogical conclusions, insufficiently supported assumptions, and lack of evidence (Haydel, 1987).

If atomistic errors proliferate, select one page and identify the most obvious. You need not be a grammarian to see these
common mistakes. Focus on the holistic problems that cloud the meaning of the content. Frequently, a confused paper represents a confused mind.

Instructor comments are most instructive when they are presented in the following way:

1. Use vocabulary that the student will easily understand. Avoid technical references in your comments.

2. Provide complete comments, rather than cryptic phrases.

3. Always provide comments in the graded, final draft.

4. Try to find something positive to say.

5. Give specific advice concerning conceptual problems.

6. Mention editing problems, but focus on ideas.

7. Encourage students to use peer revision. Other eyes see things the writer misses.

8. View responding as a means of providing feedback instead of as a means of justifying grades.

9. If possible, make comments during the writing process, rather than after the final draft. Comments redirect and improve thinking, which leads to improved writing. Grade only the final product (Schmidt).

Sample of Grading Criteria

Rubrics are often created to focus on the expectations of the assignment. Criteria should match the assignment objectives.

Grade of A: Consistent, clear, effective communication of ideas.

Communicates purpose to audience.

Clear focus, adequate development, coherent thoughts.

Appropriate organization for topic.

Provides required material as determined by assignment.

Grade of B: Strong, but contains occasional deficiencies in one area, with minor problems in several areas.

Distractions caused by errors in writing or style.

Grade of C: Does the job adequately.

Deficient in more than one area.

Maintains its purpose.

Grade of D: Serious problems in focus.

Lack of development.

Unable to convey message.

Purpose is undermined by errors in writing or style (*A fuller Definition).

Do not implement writing in all classes at the same time. Use it as a tool when it is relevant to what you are teaching. Stagger your workload. Holistic reading will allow you to read as many as 25-30 short responses in 5-10 minutes. Look for specific responses;
some will write more than others; some will write almost nothing. Consider writing quickie, non-judgmental responses when appropriate.

**Conclusion**

The ability to write is fundamental to success. Writing shapes thinking, facilitates learning, and empowers creativity. We at ERAU must successfully prepare our students for the changing workplace of the 21st century. Students need to learn how to solve complex multi-disciplinary problems through effective communication, which goes beyond merely expressing oneself orally. Education must extend beyond the acquisition of knowledge and facts to include critical thinking and clear, logical communication of information.

Serious problems occur when a professor cannot distinguish between students who understand the content but have trouble communicating it and those who really do not understand. Poorly written work is difficult to grade, since it obscures the content. Students should be held responsible for their ability to communicate their ideas, right or wrong. Perhaps students do not perceive writing as critical to their success and are detail-sloppy; perhaps students do not spend enough time on their assignments, waiting to the last minute without time to revise. We need to refocus them so they will understand the need for better language skills and understand that content is not the only component of success. When content instructors pass on the responsibility of writing to others, they are, in effect, signaling that only the content is important, but the process is not.

It is our job, as ERAU instructors, regardless of our disciplines, to assist students in their educational process by providing writing as a means of solving typical academic problems and developing students' analytical and communication skills. Our society demands that, regardless of their vocation and technical skills. Writing is an integral part of learning, regardless of subject matter.
References


Embry-Riddle Aeronautical University Graduate Catalog (1998-1999), 7.


