THE MOST PRECISE TOOL IN SCIENCE IS LANGUAGE*

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English is a tool, as is math. The scientific method is also a tool. Each is useful, whether one is reasoning, communicating ideas, or perceiving reality. I try to emphasize this to my students by my use of these tools, and by getting students to reason through these tools for observations, class discussions, and written work. As I explain to the students, all the training and scientific equipment in the world are useless if a scientist cannot express his or her findings clearly to other people.

In seventh-grade science classes, I am first of all very accepting of all written work, especially at the beginning of the year when students are trying hard to adjust to the rigors of changing classes, having different teachers, and being grown up junior high students. I have learned to be patient, for most seventh-graders are, intellectually, still children. It is consequently very hard for them to get down on paper all the words and images that go through their minds, let alone to select the best words and sentence structure to make an idea clear. As the year progresses and the students and I feel more comfortable together, I try to get them to improve the clarity of their work, so that all of us in the classroom can understand more easily just what they are thinking.

I explain to students, when their choice of expression gives me an opportunity, how their ideas could be misunderstood. I use humorous examples to aid their growth of understanding about the importance of clarity and to motivate them rather than to make them feel put-down. Here is a recent example. In response to a question about why a control situation was used in an experiment, a student wrote, "TO see IF theresalts when The same." The student and I looked at the answer. Of course, he knew what it said and we had a good laugh over my thinking he had just misspelled "their." His idea was "to see if the results were the same." I pointed out why I had thought he might have been thinking that the experimental set-ups were trying "to see if their salts were the same." At once he saw that penmanship and spelling go hand in hand to clear the path for accurate communication. By stepping outside his own mind and looking at what he had written from another person’s point of view, he began to be more selective in his choice of words.

Here is an example of how I support correct word usage in terms of spelling and meaning. A student-made menu included a "hot dog raped in bread with butter and cheese." I read the sentence to the student. We both had a good

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laugh. Then I asked, "How do you really spell 'wrapped'?" "Rapped" is what he spelled. "That would be fine, if you were knocking the hot dog against something," I said as I rapped the desk with my knuckle. "But," gesturing with my arms, "we're talking about wrapping something around something. 'Wrapped' is one of those words that's spelled funny." I wrote it on his paper. "You have to put a silent-sounding 'w' at the front of it." (Note the verbal, physical, and visual modes of instruction. I find that utilizing various sensory modes increases the chance of long-term learning, especially when students are performing below average in basic skills.)

To show that punctuation aids clarity, I use examples, again usually working with individuals and their own papers, to note the pauses and stops in their ideas. I read student writings aloud, pausing where they have used commas and stopping at the periods. It really is hard for many students to comprehend what a run-on sentence is. But I find they can hear how, from a different reader's point of view, their choice of punctuation can run-on (or chop up) their ideas, making for confusion.

Pronouns are a good target for pointing out problems of clarity. To what does "it" refer? "Who"? The students know to what or to whom they are referring. But after I discuss with them what I might think "it" could be and why "it" could be more than one thing, they see that, since a reader's mind is not their mind, the reader may have to imagine what the student is trying to say. And they can see that imagining and knowing can be two very different things.

Once in a while, I have students exchange papers, as another way to help them get beyond their self-centered world of communication and see how other readers can be confused by their writing. Sometimes I ask them to write brief questions or comments about confusing information in another student's paper. The writer of the paper studies the comments and, if necessary, discusses them with the reader. I find that this exercise helps some students gain considerable insight into the ways they confuse others by what they do or do not put in their papers.

Toward this same end, I occasionally have students work in groups of two, three, or six to make and report lab observations. I form the groups so that the individuals in a group can use their strengths to help each other improve their different weaknesses in communication. The sharing of ideas and observations permits students to recognize the importance of adjectives, punctuation, precise measurements, objectivity, etc. I ask them which description is easiest to understand and why? I ask them which description lets them visualize, hear, smell, or feel most accurately what the writer observed. Depending on the observation task, there are various other questions I ask that let students apply skills they are learning in their English classes.

It is difficult to discern real growth of learning from day to day. Students especially need to see their growth in order to know that they really are learning in a permanent sense, rather than just cramming for tests. One very effective way I have found to help students see their growth is to have them repeat an observational science task they performed earlier. Following a little critical discussion of a Fall observation, I keep the student papers until they have completed the task again in the Spring. When they compare both records, the students discover for themselves that, during the year, they have learned some scientific facts, that they can make more thorough observations, and that they can communicate their observations more accurately and clearly than they could just a few months before.

When students write extra-credit reports on a scientific topic of interest to them, I accept what they turn in. If they used a book or filmstrip for the report, I ask them to indicate the title at the end of the report simply as "Source:______." Then I ask them if they copied any sentences from the source.
WRITING AS A WAY OF TEACHING

As the lead article in this issue may suggest, WTA does not feel that writing only goes on in English classes. If Sheridan Baker is right in "Writing as Discovery" that writers "discover what we know by writing it out, bringing up from our tumbling mists of thought...concepts we hardly knew we had" (ADE Bulletin, Nov. 1974, p. 34), any field interested in concepts should be interested in writing as a way of teaching. Cheryl Snyder—who calls language "the most precise tool in science"—certainly suggests the pedagogical usefulness of writing in elementary science instruction. And in the accompanying article on this page, Findlay College sophomore Jeff Templeton tried to see how writing could be used to teach his second major, Economics. If the issue of writing-in-other-fields is clear to sophomores and science teachers, perhaps we each know of a historian, sociologist, or art historian we could personally approach about writing as a way of teaching. (RCC)

course, journals, writing-oriented assignments, and collaborative workshops all could help students understand the bases of each issue and how everyone is affected by the issues.

The journal would be a place for students to collect information about topics from various media to augment the text. If the class were studying higher education, student journals could convey accounts of the financial difficulties of private colleges, reports on the growth of two-year schools, information on student financial aid. Each week, students could be required to write an entry explaining how their opinions were being changed by what they were recording in their journals.

Writing assignments could encourage research and student response. An assignment like the following one help students develop informed opinions: "Having read How We Are Killing Our Small Colleges and the article by Ohio State University's president, discuss the validity of state support of universities. Support your answer with material from both sources and from our text."

Before handing their papers in, students could be formed into groups of five to discuss their papers without the teacher's intervention. Although such discussions should center on the opinions and their support, it also would point out areas in which students are not clearly expressing their views, and it could identify places that a student might like to discuss with the instructor before the deadline... . . .

* Jeff Templeton was a sophomore when he wrote the paper from which this piece is excerpted as part of his work in Findlay College's Teaching of Writing class.

WRITING INSTRUCTION IN ECONOMICS CLASSES

There are several reasons economics students need to be able to communicate well in writing. First, writing can help students understand new or difficult concepts. For instance, a graph showing the crossed lines of the supply and demand curves may be very confusing to students in an introductory class. Yet if students were to write a few sentences about why price increases as quantity available decreases, they would consider it common sense. Through writing, that is, they could more easily organize information into a concept... . . .

As Janet Emig states in "Writing as a Mode of Learning" there is evidence that the very act of writing "serves learning uniquely because writing... possesses a cluster of attributes that correspond uniquely to powerful learning strategies." Drawing on the work of psychologists, linguists, and learning theorists, Emig argues that writing stands out among the language processing—reading, writing, talking, listening—in its benefits to students. (College Composition and Communication, May 1977, 122-128.)

That writing can be a powerful learning strategy in the introductory economics class seems very clear to me. For instance, in an issue-centered course organized around Leftwich and Sharp's Economics of Social Issues (Business Publications Inc., 1976), students study various issues—inflation, higher education, crime, etc.—and the economic bases of the issues. In such assignments, and collaborative workshops all could help students understand the bases of each issue and how everyone is affected by the issues.
if so, I ask them to use quotation marks in order to give the original writer credit for the idea. Through experience, I have found that students set the spirit of avoiding plagiarism if I take the time to speak with them individually about it as the need arises.

Many students at this age just do not understand the ethics of using quotations in reports. However, when I explain to a student, who is engrossed in reporting what he or she has learned, what quotation marks mean and how to use them, the student seems to accept the convention readily. Students admit, too, that they would like people to give them credit for their good ideas. I let the students know they will get more extra credit if they use quotation marks properly. And I openly admit that it is hard to rephrase or summarize a scientific idea in an encyclopedia article, because it is hard to talk about something in your own words if you do not understand it thoroughly. I encourage students to seek information without fear of admitting ignorance by their use of quotation marks.

When students get their reports back, I suggest that they rewrite them in their own words and hand in both copies for more extra credit. Some students have improved their understanding and confidence by reworking as many as four drafts. Most do it just because they are turned on to making their ideas clear to someone else. By being away from the report for a few days while I grade them, students become less anxious about the papers. Also during this time, their brains have time to sort out unconsciously the fundamental points from the details. Many times, students rewrite their papers only to find that they really can talk about the topic without being entirely dependent on exact words from their original source.

In sum, I start with each child where he or she performs comfortably. I do my best not to put a student down for being a terrible speller or a creator of run-on sentences. In fact, I find that some students perform poorly on written work simply to make otherwise good ideas hard to understand. Usually, the child does this because he or she is afraid an idea is wrong. Criticizing such a student for lack of clarity, protects him or her from the deeper hurt of feeling too dumb to have a good idea. Students usually can handle the clarity problem because, deep down, they think they can write pretty well. I begin at this point with students, asking them to try out ideas, and reminding them that many scientific questions have more than one right answer. Students respond to this approach because I let them know that only by expressing their ideas as best they can will they be able to find out whether or not an idea is useful. First noting errors the students are able to correct easily, I begin a year-long process of shaping communication behavior little by little, so that communication becomes increasingly clear.

While, as a science teacher, I am most interested in students' acquiring scientific concepts and facts, I mark their written work with circles, question marks, and brief comments or questions—humorous whenever possible—to draw attention to confusing answers. I take off a point of so when a paper has significant errors in spelling, penmanship, punctuation, or a confusing choice of words. I ask the kinds, "What good is it to know all that science stuff if you cannot communicate it to someone else?" Communication is basic to one's education, I try to teach my science students, not because communication skills are an end in themselves, but because they are the chief means to reach goals we set for ourselves in our vocations and avocations and to secure physical and emotional needs throughout our lives.
A notable change in the teaching of composition over the last few years is the emergence of this field of instruction as a legitimate discipline with its own subject matter. Increasingly, teachers appear to offer instruction in composition without apology and with conviction that the writing skills we impart really will liberate students' minds and communicating abilities. Recently, however, among the many insights I've gained from the literature on invention, form and structure, and style, an intriguing observation has occurred to me. Simply stated, authentic writing and purposeful reading rarely (if ever) occur in the absence of other writing and reading. Yet, the way we teach writing—allowing students to view each essay they write or read as separate and complete and independent—is misleading and may ultimately inhibit if not prevent the achievement of our goals. I include reading here because I believe students and teachers must perceive the relatedness, the fabric, of what they read if they're to recognize relatedness in what they write. I'll explain.

Virtually everything I read is a fragment of a network, of a universe of discourse. Any single newspaper account offers only a particle of what's happening or what has happened in our world. For a more satisfactory picture, I must read articles that precede, articles that follow, and articles—not necessarily directly related—that appear concurrently. Only then will I have a substantive sense of events, contemporary or historical. Likewise, although in the magazines I subscribe to I read articles each month written by different people, each magazine leads a sense of continuity and fabric by its editorial policies, its reservoir of contributing writers, and its response to its audience. And when I read articles of professional interest, I'm beginning to realize that my comprehension evolves, as does my ability to evaluate and synthesize, from a gradual accumulation of people and ideas. One article becomes an introduction to another; one writer's work an illustrational reference for other writers; one an antithetical perception of a thesis presented elsewhere. As I accumulate a body of reading experiences, I begin to approach a unity and completeness I'd always been led as a student to believe should be contained in each individual work. But because individual works rarely provide that satisfying sense of completion, I've frequently turned away in frustration prematurely, convinced the writers were fakes or the subjects unmanageable.

Must the same realization apply equally to writing as a process. These days, teachers of writing are encouraged to write as an avocation. Frequently even those who don't consider themselves writers at least write their own assignments as a means of verifying their goals and instructions. Anyone who writes often must observe that whatever s/he writes relates more or less to what s/he has written and will write. Poems I write, stories, reportive narratives, descriptions, expositions and analyses, arguments and theories all futher clarify me to myself as well as to others and follow parallel tracks of developmental insight and skill. They contribute to one another—always, but with increasing power, I begin to recognize their kinship. And as I expand my commitment as a writer, my commentary, whatever its form, begins to find its place among the writings of my profession, my culture, and the universe that surrounds me.

This essay, as an illustration, does not/should not represent the ramblings of an outlander isolated in the vastness of western South Dakota. Rather, I seek to express my unique convictions, influenced as they are by my time and place; representative of a link in the chain of my progress as a writer and teacher—but linked I hope to the concerns of other teachers and writers, a part finally in a field of knowledge—a chain-linked universe of discourse. /To p. 6/
The most flagrant violation of responsible reading in response to student writing is found in the practice of requiring students to do all their writing at home. Thus the teachers never see students at work for the purpose of collecting evidence which might illuminate their written products. After months of daily "contact" with students, teachers still not know, for example, whether an individual writes with facility or has trouble getting started; whether the finished sentences have been composed at almost the speed of speech or with so many false starts and interruptions that the original impulse was lost or muddled.

It is hard to conceive of a critic or scholar who would deliberately reject an opportunity to interview a writer whom he or she was in the process of reading. Still, it is the rare teacher who takes the time and trouble to ask student writers detailed questions about their experience of composing, editing, and proof-reading so that it can be known whether the work produced is the result of conscious deliberation or unexamined habits. It is so much easier for the teacher to tell the students which procedures they should adopt than to find out what they think they are doing, and to study the relation between their notions of composition and the results which are obtained.

To take an example, a particular student writer may be under the impression that it is impossible to begin an essay without first composing an outline. So much time is consumed in pursuing this task before the writer is aware that he or she has something to say, however, that the resulting essay is shallow and slight. A far better essay might have resulted if the same person simply had brainstormed a first draft before attempting an outline, or forgotten about outlines altogether. But this discovery was never made because the teacher knew nothing of the particular individual's habits of work and provided general advice rather than suggestions tailored to the student's specific needs.

Once an instructor has begun to study a particular student, and has become informed about that individual's behaviors and awarenesses as a writer, it is possible to assess progress—but only then. For example, if one knows that a person has habitually submitted very brief, "correct" papers because most of his or her composing time is spent in rejecting whatever comes to mind, the greatest sign of growth may be a longer, more ragged composition. Such signs of visible growth are often ignored, however, because the student's teacher is committed to his or her image of "a respectable paper" rather than to study of the student's career as a writer.

Many more, perhaps better, examples might be provided to support my thesis that there exists a double standard among teachers of writing. As readers of literature, we make many concessions to the authors we meet—concessions which we, as teachers, are unwilling to make to the authors in our own classes.

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WANTED!

Brief reactions—from college and high school teachers—to Bill Bernhardt's charges.

* * *

I suggest, then, that students of writing be encouraged to see each product of their effort as part of a network. First, as part of their own corpus of writing; second, as part of all that is written. Students writing are, after all, writers. That they are fledgling writers only signifies that they will have more to say later. Their beginning writing is important because it is a beginning. Eventually, through writing and/or other means, they will become part of a larger fabric. We teachers should, therefore, do all that we can to treat their writing as a continuing process. We should not judge beginnings too critically. And we should nurture and preserve what they write for its participation in their futures.
THE DOUBLE STANDARD AMONG WRITING TEACHERS

Bill Bernhardt
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I seriously doubt that any experienced reader of literature would quarrel with any of these principles of responsible criticism and scholarship:
- Every author should be approached without preconceptions and prejudices.
- The first duty of a reader is to try to comprehend what the author is trying to say, regardless of stylistic obscurity, unfamiliar subject matter, or other impediments.
- A full understanding of any author generally requires that the reader consult other evidence than the work itself—e.g., writer's intentions, drafts, habits of composing, interviews with the author.
- Assessment of growth should be based on comparison of successive stages in the author's career, rather than in relation to an external standard.

I am convinced that few writing teachers actually observe any of these conventions in approaching their students' writing. Indeed, students are not considered to be "writers," even though most teachers of composition spend far more time reading student papers than they devote to any other species of literature.

Examples of prejudice and misconception in approaching student writing are easily found. Many instructors, for instance, readily assume that the presence of certain spelling irregularities in the writing of Black students (e.g., omission of -ed and -s endings) indicates confusion concerning the verb system of "standard" English. Do they know this to be true in the specific instances? Or are they operating on the basis of a preconception. Can they possibly tell, without confirming evidence, that the writers are speakers of any particular dialect of English? Or that command of one dialect prevents an individual from knowing other dialects? And why do they so often attribute such errors to socio-cultural causes when the writer is Black, and assume that they result from "carelessness" when the writer is white? It might seem that errors of this kind are sufficiently common among all beginning writers to make teachers cautious in assigning causes, but such is not the case.

The previous example should also show that teachers are not in the habit of reading student compositions with comprehension of the content as their first aim. On the contrary, their primary reason for reading is to detect and categorize errors, whether they penalize their students for them or not. Is it any wonder that so many student writers never gain a sense that writing is for expression when their only reader is someone who always notices and responds (however sympathetically) to mistakes, seldom to the ideas, perceptions, or opinions of a writer? This state of affairs is all the more ludicrous when one recognizes that the instructor who is willing to tolerate ever so many obscurities or idiosyncrasies in a published text protests that he "can't read" a student composition containing a few, easily deciphered, departures from orthodox spelling, sentence structure, or logical arrangement.

KEY EDITORIAL CONCERNS OF WLA NEWSLETTER
-The fundamental compatibility of creativity and discipline in good writing and in effective writing instruction
-The role of writing classes in freeing student imagination and creativity.
-Ways that teachers can expand the range of instructional options open to them.

ARTICLES WELCOME

WLA Newsletter welcomes very brief pieces that relate to the Key Editorial Concerns and grow out of practical teaching experiences. Irregular WLA departments are: Teaching Tips, Reading Lists, Student Perspectives, and Interconnections (among different levels of writing instruction.)

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"STUDENT PERSPECTIVES ON LITERATURE" CONFERENCE
FINDLAY COLLEGE
3 MARCH 1979

The second annual Student Perspectives on Literature Conference will be held at Findlay College on Saturday, 3 March 1979. The conference—open to students of high school honors and college prep classes—resembles academic conferences in which scholars hear and discuss ideas developed by their peers in literary papers. In this case, advanced high school students will read papers, and share ideas with, others who are seriously interested in literature.

There will be from twelve to twenty sessions, each featuring three student papers. Topics of the sessions will be based on the papers that are submitted—though sessions on American Literature, English Literature, Shakespeare, World Novel, Short Fiction, and Poetry are all probable sessions. At the final session of the day, Certificates of Participation will be presented to students who read papers and Prizes will be awarded. The $1.50 registration fee includes lunch.

Student papers may deal with authors, individual works, themes, techniques, or literary forms. Papers should be between 3 and 9 double-spaced, typed pages and should follow a consistent documentation form. Papers need not be filled with footnotes; as the conference's theme indicates, papers should reflect the student's own perspectives. Papers will be judged on their insights into literature and on the directness and honesty (as opposed to jargon and pseudointellectualism) of their writing.

To submit a paper, send it by 29 January to the Conference Coordinators: Richard Gebhardt or William Wagner, Findlay College, Findlay OH 45840. Drafts of papers may be submitted to allow continued work while they are being considered; they should be typed and identified as drafts. Include this information with submissions: Name, address, phone number, school address, name of teacher and class for which the paper is being written.

Teachers who would like to incorporate the conference into classes as an audience or motivational device are invited to offer suggestions for program sessions. A memo suggesting ways to build the conference into classes is available from the Conference Coordinators. Teachers are also welcome as volunteers to serve as session chairpersons/discussion leaders.