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# NEW GOALS IN EDUCATION TO EMPHASIZE BETTER TECHNICAL COMMUNICATION

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Over coffee one day a few weeks ago, a professor of government was complaining to me of the atrocities that his students commit in the name of the English language. One of his students, he said, had recently written that in England "the prime minister is the man who heads the government and has relations with the queen."

Today it is of course fashionable for teachers to complain that the writing of their students isn't what it used to be. I suspect that it never was. I suspect that even Socrates used to mutter that everything his students wrote was Greek to him. Students hold no monopoly on slipshod writing. Even so admired and accomplished a craftsman as Graham Greene on occasion comes up with a sentence such as this one: "Kay Rimmer sat with her head in her hands and her eyes on the floor."

Now, sloppy writing of that sort by students or novelists may raise a mild snicker, if it is noticed at all. But when a technical writer or a scientific writer treats his words that shabbily he may even put human life in jeopardy.

I am not exaggerating. Quite some time ago, I came across a medical article advocating surgical operation to alleviate certain kinds of anemia.

The author reported that he had achieved good results by using his procedure on a 10-month-old patient with anemia. He mentioned that the baby's brother, who had not undergone operation, had died at the age of eight months. The author concluded by mentioning those two points--his success in operating on the baby, the death of the brother. Then he said: "In such cases, splenectomy is imperative."

But in what cases? Cases of anemia in 10-month-old patients? Cases of anemia in 10-month-old patients whose brothers or sisters have the condition? Cases of anemia in 10-month-old patients whose brothers or sisters have died of the condition? Cases of anemia generally? Or what?

The typical physician, I suppose, would put his own interpretation on the author's words, as readers generally do. The particular interpretation could be awfully important to the patient, though, and I have often wondered how many persons are walking around needlessly despleened because their physicians made the wrong one.

In typical pedagogical fashion, I have taken the circuitous route in arriving at my subject, the education of the technical writer or editor. But along the way, I think, I have at least hinted at what I regard to be his importance.

He is the interpreter between us ordinary mortals and the strange land of science and technology, with its arcane secrets, its mysterious rites, its cabalistic signs and symbols, its private language. Indeed, he is an important interpreter between natives who come from different provinces of that land--between provincials who speak articulately in their own tongue but who do not comprehend the dialects of countrymen who come from adjoining territories, let alone from remote ones.

Let us not underestimate the importance of this job of helping scientists or technologists speak to one another. We all know that men of science have a hard time communicating with their neighbors, whose work may be relevant to their own. Next June the American Medical Association will bring out the first edition of a book to standardize medical terminology. The book represents the first step in developing a system whereby physicians from all parts of the world can understand one another.

All right, then; all of us here can agree, with proper modesty, that the technical writer or editor is a pretty important guy. How does one prepare him for his important task?

In answering that question, we at once bump into a perennial question. It is one that has furrowed more foreheads and inspired perhaps only little less debate than the ancient question about the chicken and the egg. Should one try to make a writer or an editor out of a trained specialist? Or should one try to convert the trained specialist into a writer or editor?

For years now, McGraw-Hill has kept a sharp corporate eye open for bright, articulate graduates in engineering and the sciences. It has swooped them off to 330 West 42nd Street, where it has taught them the craft of journalism, then put them to work as writers and editors.

On the other hand, the Miller Publishing Company of Minneapolis has brought journalism graduates into the business and, on the job, taught them the intricacies of the special fields that its publications serve. Its apparent assumption is that the editor of American Baker can cover technical developments in his area with a high degree of perceptiveness, accuracy and understanding, even though he may not be the best person in the world to pop a batch of muffins into the oven.

As a matter of policy, the Mayo Clinic has staffed its editorial department

with physicians; on the other hand, some of the most respected medical editors in United States clinics are not entitled to sign M.D. after their names.

Which is the better plan--to recruit technical writers from among specialists or from among journalists? That question can never be answered satisfactorily, it strikes me, as long as one insists upon an either-or reply.

In some highly specialized fields, it seems preferable that the writer or editor should have his scientific training first and that to this should be added his journalistic skills, however acquired. Even here, though, please note that the word I use is "preferable" and not "mandatory." On the other hand, in most areas of science and technology, I think that the skilled writer or editor can learn competence in the specialty. I would not underestimate the capacity of the human mind for expansion if it is given sufficient motivation.

Implicit in what I have just been saying, I suppose, is profound faith in the competence of schools of journalism to turn out graduates who can perform skillfully as technical writers and editors. And indeed I hold the somewhat biased position that employers might look to schools of journalism for at least a part of their supply of technical writers.

In those happy days for journalism graduates, I might add, they will encounter a lot of competition for talent. We are listing about four jobs of various kinds for each of our graduates, and other schools of journalism across the country report similarly high ratios. Even so, the school of journalism seems a logical place to look for a writer or editor of even highly specialized copy.

Now, most schools of journalism do not have curriculums in technical journalism. Nor do I think they should have. At first glance, the specialized curriculum seems a handy way of meeting the need for all manner of specialized journalists. Probably most journalism administrators have been approached at

one time or another by honest souls from honest occupations who suggest that the school add a curriculum to prepare young persons for their own special area. Take, for instance, editors of company publications. Singly and as a group, they have for years been urging schools of journalism to establish special sequences in industrial publications. Indeed, a number of schools have. More recently the editors of education magazines have been sounding out journalism administrators. Would we, they ask, like to set up a curriculum in education journalism?

One reason for such requests, I suppose, is the comfortable assurance that someone will be feeding one's specialty a reasonably steady flow of reasonably competent personnel.

But another reason, I have always darkly suspected, is a subconscious quest for status. For a university does confer a certain amount of status on any occupation when it deems it worthy enough and difficult enough to dignify it with a special curriculum. In fact, it is a much grander way of getting status than simply changing one's name, in the way that funeral directors became morticians and trash collectors became sanitary haulers.

Moreover, schools of journalism are flattered to be able to confer status on anyone, since for the better part of their history they have been consigned to lonely and remote fringes of academic respectability, shunned by other professors as overly practical and damned by journalists as overly theoretical.

For the most part, schools of journalism have stoutly resisted the temptation to splinter their programs into a multitude of little specialties. The techniques of communication are pretty much the same, some of us have argued, whether the field of application is political science or physical science. And it is no more logical to argue for a special curriculum in education journalism or industrial journalism or science journalism, we have contended, than to argue

for special curriculums in political science journalism, economics journalism, sociology journalism, physical education journalism and so on down a long and tiring list.

Obviously, then, we are not empire builders. For it is intriguing to speculate on the wonderful array of courses we could devise for just one curriculum, religious journalism--"Reporting for Methodists," "Writing for Presbyterians," "Editing for Unitarians," "Non-Denominational Typography" and so on.

What any writer or editor needs, I think, is four things. First is an understanding of the essence of his subject. Second is an understanding of the principles of effective communication. Third is skill in investigation or, if you will, reporting. Fourth is some skill in applying the techniques of communication. I like to think that the best place he can get those things is in a school of journalism, but I am not so presumptuous as to think we have a monopoly on them.

Let us take a look at these four qualifications in some detail.

First, I said that the writer or editor should have an understanding of the essence of his subject, and I would underscore the word "essence." By that I mean that he should have a grasp of the basic principles. He should know the history of what he is writing about, not for its mere antiquarian interest but for its relevance to the present and future; its major assumptions; its accomplishments; its important unsolved problems and its progress, if any, in solving them. He should also have some proficiency in the special language of his subject if it has one. Those things are more important to him, I think, than mere information, which any good reporter should be able to get in abundance and which has a way of becoming obsolescent with distressing rapidity.

Let us remember that the reporter need not be a doer in the field

that he is writing about. A James Reston can report on affairs of state for the New York Times with a good deal of insight without his ever having held public office or engineered a political deal in some smoke-filled room. Few persons would dispute his ability to make politics intelligible to both the practitioner and the layman. The science or technical writer can do much the same thing for his field, I submit, without ever having consulted a table of logarithms or scorched his tie on a Bunsen burner.

Second, I said that the writer or editor should have an understanding of the principles of effective communication. The technical or science writer needs this understanding even more than most writers, I think, since the persons whose accomplishments he is dealing with quite often try as hard to excommunicate as to communicate, a failing they share with bureaucrats and academic types such as I. The social scientist who is reporting a truism, for instance, dares not let his commonplace thought stand naked. If his research tells him that people who ride in automobiles are more likely to be killed in auto crashes than those who don't, he is likely to hide his finding under garments such as these: "In the light of the evidence revealed by this study, it is not unreasonable to suppose that the incidence of mortality arising from vehicular collision involving two or more vehicles is likely to be substantially higher among those individuals who are typically conveyed by automotive vehicles than among those individuals in the segment of the population who generally do not utilize that mode of transportation." In medical journals, patients seldom die, although something or other--this drug or that surgical procedure--may "tend to have a terminal effect." The perpetrators of such writing usually defend it as essential to precision, of course, although I am unaware of anyone's yet establishing a high correlation between unintelligibility and precision.

In recent years, communications researchers have come up with a good many

findings that should enable us to communicate effectively. Some of their findings, it is true, are largely documentation of things that rhetoricians have known ever since the days when Aristotle was writing his freshman composition text and Athenians were referring to Demosthenes as "Old Pebble-Mouth."

But they also have told us a good deal about the barriers and limitations inherent in any communication, much about the retention of information, much about the nature of attitude change. They have reminded us that in any communication there is a sender, a channel (which is often bedeviled by noise factors, literal or otherwise) and a receiver, and they have shown us some of the disorders that can occur at any stage of the communication process. They have given us some idea of the comparative strengths and weaknesses of various channels--print versus sound, for instance. They have reminded us forcefully of what many of us who write have had to learn the hard way--that it is always the reader, never the author, who ultimately determines the author's meaning. In short, communications research has come a considerable distance since the postwar years when covys of graduate students were scurrying around applying the Flesch readability formulas to any piece of prose more complex than a restaurant menu.

Technical writers and editors, no less than sportswriters and professors, could improve the quality of their output if they gave some attention to what we now know about effective communication.

Third, I said that the writer or editor should be skilled in investigation. He should be a good reporter. Not only should he know the likely sources of information, which of course are not restricted to just other people; he also should know the most profitable questions to ask of those sources. So should the technical editor, who should have a deep, abiding but friendly distrust of every word that passes under his copy pencil.

If we make the perhaps naive assumption that every writer should have

something to say, then every writer except the few blessed with omniscience or total recall should have some investigative ability. Take, for instance, a copywriter doing an advertisement for a new, portable power hoist. First establishing empathy with his reader, he should ask--and get answers to--every conceivable question a prospect could ask about that hoist. Or take a writer preparing an instruction manual for an offset printing press, an earth-mover or an electric dryer; he should know that piece of equipment as well as the designer.

It is in teaching reporting, I might add parenthetically, that most schools of journalism seem to fall short. For it is much easier to grade a student down for his split infinitives, double negatives and dangling participles than for the facts he did not get--facts that even the instructor might understandably be unaware are missing.

Fourth, I said that the writer or editor should have some skill in applying the principles of effective communication. It is one thing to know the principles; it is quite another to put them to effective use.

Writing is not just a matter of putting down one word after another on a sheet of white paper; it is hard work, and it is surely one of the loneliest jobs there is. Yet I think that it is not asking too much of a writer that he be able to write--concisely, precisely, accurately, ably and even with a touch of grace.

An editor need not be a good writer, but he should know good writing when he sees it and he should treasure it. He has his own special techniques of communication, and they are not as remote from those of the writer as one might think. For writer and editor alike, each in his own way, can look for guidance in those age-old principles of unity, emphasis, coherence and interest. The writer, sweating over his article on dipolar ferrite modes, should want it to be

all about a single topic, should want the important points to stand out and the unimportant to be subdued, should want to carry the reader easily from one part of the piece to the next, and should want to hold the reader's interest from the first sentence to the last. The editor of an electronics magazine or an instruction manual, too, should want the entire publication to have a feeling of oneness about it, should want the major ideas to dominate, should want to carry his reader from one section to next in some logical fashion, and should want to hold the reader's attention if not his interest from cover to cover.

Those, then, are the qualities that I think you should be looking for in technical writers and editors. You should be looking for persons who know the essence of their subject, who know the sound principles of communication, who can dig out the information they need and who can communicate effectively with others. The population is now overburdened with persons of that sort. Even schools of journalism, I must confess, are not producing them to any great excess.

But the schools of journalism are trying to produce them. Let me remind you that in almost every school of journalism, its own courses typically constitute but about one-fourth of a student's total program. The student takes about three-fourths of his work, then, in other parts of the university. This arrangement, we like to think, gives the student some chance of understanding the subjects that he eventually will be writing about. It also gives him some flexibility in preparing for a career.

Let me illustrate what I mean with a few references to the University of Illinois. Ordinarily students in our College of Journalism and Communications take three-quarters of their work in liberal arts, although some of our advertising majors take that work in the College of Commerce. But suppose a student wants to prepare for some specialized field of communication. Our arrangements are flexible enough for him to do so.

A student wishing to prepare for a career in agricultural journalism can learn his subject matter in the College of Agriculture and can learn the principles of communication and their application from us. In fact, he can get that combination in either of two ways--by majoring in agriculture and minoring in journalism or by majoring in journalism and using three-fourths of his total work to study agriculture.

We also have a limited program in medical journalism that permits a student to take a heavy concentration of courses in the sciences and to cap them with our regular courses in journalism. The news editor of the Journal of the American Medical Association and a Chicago advertising copywriter specializing in pharmaceutical accounts are among the products of this program.

Some students have spent their first couple of years at the University studying engineering, then have come to us for a degree in journalism. Perhaps even better, some of our students have earned their bachelor's degrees in some special field, then have come to us for a master's degree in journalism.

These approaches are by no means unique to the University of Illinois.

In short, the machinery is there. Alas, it is not producing enough able technical writers and editors--or journalists of any kind--to meet the demand. For more than a decade, during which college enrollments have bounded upward, enrollments in schools of journalism across the land have slid steadily and inexorably downward--so much so that a few of us hardened administrators have toyed with the idea of graduating no senior until he could come up with a replacement. Once again now, happily, journalism enrollments have begun to move upward, and they probably will continue to rise.

But even that does not mean that employers will be pestered by a steady stream of young men and women with the qualifications I have just enumerated. If you want your share of talent, I think you will have to do some recruiting.

Everyone else is. Advertisers, broadcasters, magazine publishers, newspaper publishers have belatedly joined the scientific and technical fields in sending representatives to campuses to put the finger on talented prospective employees.

For the most part, however, they have been somewhat short-sighted in their recruiting. For the most part, they have competed with one another for their share of college seniors. With few exceptions, they have done little to expand the reservoir of talent by going to the high schools to acquaint young persons with career opportunities in the whole broad, exciting and expanding field of communications.

If I were you, that is what I would do--start letting high school students know about your work. You represent an important field, one that deserves its share of bright, young minds. And the sooner the student starts preparing for a specialized field, the better.

Admittedly, you will have a tough time. Most young persons to whom I have talked recoil at any mention of a career in technical journalism because it sounds dull, plodding, unglamorous. Encouragingly, though, many of those who enter it are loath to leave it. They become missionaries for it. They find their own brand of glamor in it. One woman graduate wrote a former professor that she was even finding glamor in the commercial fertilizer industry.

My instincts tell me that I have passed up several good opportunities for ending this talk, and I will avail myself of this additional appropriate place to end.

Let me conclude by confessing that there may well be some gap between my rhetoric and actual practice, some gap between what I have been saying about schools of journalism and what actually goes on in their hallowed halls. I have been stating our objectives; I will be the first to concede that we have not

always met them.

But then this gap between objective and its fulfillment exists, I think, at every level of education. I was reminded of that point the other day when a friend told me of his son's first day at school.

"And what did you learn in school today?" his mother asked, as mothers have ever since Eve packed Cain an apple for lunch and shooed him off to nursery school.

"I didn't learn nothing," the little boy complained.

"You mean you didn't learn <u>anything</u>," the mother corrected.

The little boy just shrugged his shoulders. "See what I mean?"