

**Writing as a Process of Learning:
Attempts Made in the Case of Civil Engineering Report
Writing Course at the University of Dar es Salaam,
Tanzania.**

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Abstract

This article discusses the results of a study of the difficulties of teaching writing skills to engineering students at the University of Dar es Salaam in Tanzania. The discussion addresses issues such as motivation for writing on the part of the relevant students, as well as the extent to which lecturers of such students may assist them to acquire the appropriate engineering report writing skills.

1. Introduction

When we talk of academic writing we mean the kind of writing that students do. It does not include the writing of professional academicians like lecturers or professors. This article is concerned with how students express themselves in writing. In particular, the paper addresses issues such as: why students write the way they do; how lecturers respond to students' writing; how students can be helped to improve their writing skills; and how writing as a skill can be used in the process of learning and discovering new ideas.

Students' writing differs from other types of writing in several ways. First, most of the time it is assigned writing. Students are normally given topics to write about, and sometimes outlines are also supplied in contrast to other types of writing where writers choose to write about what interest them. Secondly, the reader of student academic writing is in most cases informed of what the content is or should be, and therefore is less keen to know what a student has got to tell compared to readers of other types of writings which are read (out of interest) to get new information. This situation places a certain amount of strain on the

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student even when s/he is well-informed about what s/he is writing. For example, in a study by Ivanic and Simpson (1990), John, a mature entrant adult literacy student was "...scared about handing his paper in because he thought he might have gone too far and jeopardised his chances of a good assessment". This was despite the fact that the paper was based to a large extent on the work John did for his placement in the Adult Basic Education Department of the local College of Adult Education. The point here is that most academic writing is taught and learned in situations that are far from natural, and these teaching and learning situations might have a bearing on how students learn writing, and how much interested they become in writing.

In the field of engineering, things are a bit more complicated. Most students do not see why they should be required to learn academic writing. One year ago, while at Lancaster University, I attended a talk on 'Writing across the curriculum'. One of the commentators, a lecturer teaching writing to engineering students in a university in Syria, recounted his discussion with an engineering professor on the importance of language, and particularly of writing for engineering students. And the engineering professor (almost angrily) said something to the effect: "...language, language, why language? I look forward to a day when we shall have engineering without language." We hope that this is not a view that is universally shared, although it would seem that those who hold it do so very strongly.

2. A-literacy: The Product of an Alienating Writing Pedagogy

Classroom research on writing suggests that most students coming to, and going out of universities, appear to be 'a-literate' (Cambourne, 1986). 'A-literacy' is not to be confused with 'illiteracy'. According to the Oxford English Language Dictionary, an illiterate person is one who has not achieved minimal levels of competency in reading and writing. An 'a-literate' person is one who can read and write at levels society would regard as adequate, but who chooses not to, unless it is absolutely unavoidable. 'A-literacy' is a shorthand way of saying 'alienated from acts of literacy' (Cambourne, 1986).

Gathering from the experience of over ten years teaching first year students and those about to finish their degree courses, it would seem to me that Cambourne has a point. It is true, for example, that the students I have taught do not like writing, they avoid becoming engaged in writing unless it is absolutely necessary, and sometimes they have negative perceptions of themselves as writers. Students are not the only victims of a-literacy, even some of us in

academics write only when we have to, for example when trying to meet a publication deadline, or to avoid being asked why we have not published. This situation is disturbing because: firstly, writing is not merely a tool of communication, but, for those in academics, it is an important and powerful medium of thinking and learning. It is the most powerful, readily available means of extending, modifying, examining and reshaping our thinking. It seems that too many of the successful graduates of our universities have not discovered the powerful ways in which writing can shape and modify thought and assist learning. Secondly, it is not clear—or it is not known—what the long-term effect of this alienation will be. One possibility, according to Cambourne, is 'de-empowerment' of the individual, i.e., reduction of access to options for controlling one's life in society.

One might ask: what is the cause of this alienation? There are probably many factors, and one of them might be the traditional method of teaching writing based on a theory of learning which makes it almost impossible to produce confident writers. The dominant theory of the acquisition of literacy seems to produce alienated learners. There is no doubt that there are better theories, for instance one that is based on the learning of the oral form of language. It is true that oral language is different from the written one in many ways, but the brain that learns to mean using the oral form should not find how to mean in the written form difficult, providing the conditions under which it is learned are similar.

If we consider how children learn to speak (which is in any case a language skill) we might be able to find better theories of learning to write. Think of the support, the encouragement, the help and assistance, the attention, and the praise we shower on children when they pronounce their first word; and then compare that with the lack or absence of such support and encouragement, and instead the abundance of red ink with which we mark the exercise books of children just beginning to learn writing. It is thus not difficult to see why most children dislike writing, and why as they grow up and go through school—and later to college or university—they gradually become a-literate. The reasons are clear: first, they do not receive the support and encouragement they received when they were learning to speak; secondly, their errors and mistakes in writing get emphasised through the way the teacher marks their first attempts at writing tasks. One can convincingly argue that if spoken language was learnt the way writing is, the world would be full of people who are unable to speak well. This situation implies that there is something wrong with our theories of teaching and learning to write. We can learn a lot by taking lessons from theories of learning

oral language. These encompass, first, the need to make the learning environment as natural as possible, for example, by encouraging collaborative writing in the classroom; secondly, by creating a situation that calls for a genuine need to communicate through writing; and thirdly, to find a genuinely interested audience.

3. The Role Of Writing In Engineering

In the case of teaching writing to science—and in particular to engineering—students, the problem of ‘a-literacy’ is compounded by a belief that writing is not of primary concern. Most students believe that writing is not for them. They have a notion that writing is for the people in the arts, or ‘penguins’, to use a popular term among Dar es Salaam University students. Engineering students believe that they can rely on formulas and figures, and do not need to write long essays or papers. Therefore, in their case the said ‘a-literacy’ is rationalised by a sense of complacency and a conviction of not needing to write. Engineering, they feel, is a field concerned with the production of useful objects. In keeping with this concern, engineers tend to see their own knowledge as coming directly from physical reality without textual mediation. They also devalue the texts they themselves produce, seeing them as simple write-ups of information found elsewhere (Windsor, 1990). According to Bazerman (1988) most engineers do not think of themselves as writers, seeing “writing up the results” of their work as a fairly mechanical and secondary activity. This self-representation on the part of engineers affects the teaching of engineering writing.

When we teach writing to engineering students, we directly encounter this belief that writing does not matter. We realise the engineers’ own representation of writing and/or of themselves as writers has already begun to organise the students’ resistance to what is rhetorical (Bazerman, 1988). Scholars and teachers of technical writing have, to some degree, tended to share this view. Some significant studies of engineers’ writing, for instance, examine the way writing is used to transmit engineering knowledge rather than to generate it (Allen, 1977; Paradis *et al.*, 1985; Broadhead and Freed, 1986). Writing is viewed by many as part of an engineer’s job, but not as part of engineering itself. However, in so far as engineering is knowledge about objects and how to build them rather than the actual building itself, it is necessarily a symbol-bound field. That is, even this field, which seems so tied to physical reality, is necessarily accomplished through language.

In the case of teaching writing to engineering students, there are thus two problems: the problem of a-literacy which is also shared by students in other disciplines; and the belief that writing is not of primary importance to engineers. What is the way out?

The problem of a-literacy, as suggested earlier, could be overcome by re-examining our theories and approaches to teaching writing which will be discussed in the next section. The problem of students' beliefs and attitudes towards writing can be tackled by explaining to students that the construction of knowledge cannot be divorced from language. According to Latour and Woolgar (1979), one way of overcoming science and engineering students' beliefs is to convince them that the objective of laboratory activity is "inscription", i.e., the conversion of physical reality into written documents ranging from lists of numbers to published papers. Bazerman (1988) argues that knowledge is not found ready-made in nature. Instead it is constructed in the interplay between nature and the systems we use to structure and interpret it—language. We talk, therefore, of language, and particularly of written language, as a tool for constructing ideas of a given field of knowledge being created by the interaction of its practitioners' texts, and of knowledge itself, including scientific and/or engineering knowledge, as rhetorically shaped (Latour, 1981). Moreover, the textual construction of knowledge is social in nature because each document must convince other people of its validity in order to be accepted as knowledge. Only documents that do convince others are used. Documents that for any reason cease to be convincing cease being treated as containing knowledge.

4. Communication Skills Courses

Since its inception, the Communication Skills Unit (CSU) at the University of Dar es Salaam has been offering Communication in Language (CL) courses to first year students. These courses are geared towards improving students' study skills, and in particular their academic writing. Despite these courses, it is felt (generally) that there is very little significant improvement in students' writing. This inadequacy is felt even after students have graduated from the University. The tendency has been to ask what the CSU courses have achieved as far as the teaching of writing is concerned.

4.1 CL Courses and the Product-based Approach

CL courses fall within the category of English for Academic Purposes (EAP), which is a branch of English for Specific Purposes (ESP). These are tailor-made

courses that are designed to meet the specific needs of the departments or faculties in which they are taught. The CSU has also inherited from EAP, the traditional approach to the teaching of writing.

Traditionally the teaching of writing was language-focused, and writing was used as a means of reinforcing language already dealt with in the spoken form. The emphasis of such an approach is on correctness and adherence to grammar. Copying or adapting model essays is also considered very important. For this reason, the approach is sometimes known as 'the model-based approach'. Within EAP the model-based approach remains popular because it provides an exemplar or a model. The model is in fact a final product of someone's writing which the students are encouraged to replicate. The teacher's concern is how correct the student's final product is— in other words, how much the students have been able to learn or imitate from the model. Because the teacher's emphasis is on the final product of students' writing, the approach is also called a 'product-based' approach. The trouble with this approach is that it does not indicate how the writer arrived at the model: it does not demonstrate the writing process. Most of the work in CL classes tend to follow the product-based approach.

The other shortcoming of this approach is that by looking at or examining students' written work, teachers are not able to know the processes that students might have gone through while writing. As a result teachers are in most cases not best-placed to know their students' writing problems, let alone help students overcome those problems.

The product-based approach also overlooks the fact that students who are Second Language (SL) or Foreign Language (FL) learners, like most secondary school students in Tanzania, do not have sufficient command of skills such as manipulating grammatical forms, organising paragraphs, and combining ideas. Lacking this level of competence, students cannot be expected to learn by imitating written work or model essays. Instead they need more close supervision and teacher intervention during the writing process than the product-based approach offers. This would imply that teachers of writing need to re-examine the teaching approaches they use to see if they fit their students' level of competence, or if they need to be supplemented by other approaches. These are some of the shortcomings that have left researchers in English Language Teaching (ELT) dissatisfied with the product-based approach to teaching writing.

This growing dissatisfaction coincided with growing interest in discovering how writers actually write; and what processes a writer goes through when

writing. Current concern in ELT is that we should widen our focus in teaching of writing from our pre-occupation with the end product of students' writing, and start to observe the processes that students must go through when preparing or writing that product.

4.2 CL Courses and the Process-Based Approach

The process-based approach in teaching writing means that the teacher, instead of concerning him/herself with the product of students' written work like in the product-based approach, takes interest in the students' writing process to find out how students actually write. This would imply the teacher, acting as a facilitator, organising writing workshops and/or conferences for his/her students during class time.

After some years' experience in using the product-based approach in other CL courses, and seeing the process-based approach being used by colleagues in other universities, I was tempted to try the process-based approach in one of the CL courses. I had visited Lancaster University in 1988 and 1990 and had observed colleagues, particularly Romy Clark and Roz Ivanic, successfully use the approach with M.A. Linguistics students. At least they had got the students to a point of working together, on their writing tasks, a point I believe is important in developing writing skills. Clark *et al.*, (1991) have suggested that:

writing classes ...could present chances for learners to share thoughts and experiences, reflect critically on them, and relate their individual insights, anxieties and so on to the wider social framework. Learners could be encouraged to share risk-taking moments and problematic moments of their writing. This would have a double benefit of socialising the issues, and of opening up the writing process itself so that some of the anguish involved in writing might be lessened (Clark *et al.*, 1991).

I believe the fact that learners can interact among themselves to discuss their writing problems, rather than sit alone and agonise about what to write, is an important factor that lays the ground for effective learning to take place. First, collaboration takes account of the need to make writing a social activity (rather than a solitary one), and learn from ways in which the spoken form of language is learned—a social activity—with a lot of support, encouragement and a genuinely interested audience. Secondly, when students begin to produce written work collaboratively, they learn from fellow students and become more confident to work on their own than if they had been working on their own from

the start. The confidence they gain is likely to help them produce more, and the more the learners produce the more they learn. Long and Porter (1985) observed that in small group interactions, learners talk in a more relaxed manner compared to when the teacher holds conversation with them as a group. This would mean that their writing activity can gain from the interaction that takes place in the relaxed atmosphere of group work.

Swain (1985) suggested that learners must produce to learn, i.e., speak in order to learn to speak, and therefore write in order to learn to write. She further posits a theory of 'comprehensible output' which confirmed the research findings by Ellis (1980) and Peck (1985) that learners who produce more output tend to be more proficient learners.

Garrison (1974) propounds this theory when he argues that writing is learned by writing, and proposes that the major approach of most writing classes should be writing workshops and writing conferences. Conference or workshop approaches involve students working in groups where they discuss their writings, exchange views and experiences, and learn from each others' mistakes. Supporters of this approach (Freedman, 1980; Zamel, 1983; Shih, 1986) maintain that students' writing conferences or workshops provide more feedback than teachers' comments on students' written work which can be ambiguous and sometimes confusing.

Other positive aspects of the process-based approach are that discussion with students gives a kind of feedback that responds to the content as well as to the form. The interactive process integral to conferences or workshops both encourages the teacher to respond to students as writers, and allows students to see the teacher as a reader and not just an assessor. In addition, the elimination of written criticism on students' papers places greater responsibility on students to participate in the evaluation process. Guided questions by the teacher lead students to recognise points of confusion or weakness, and to note strengths in their written work. The approach therefore gives students a chance to evaluate their own writing, and as a result students' learning habits are likely to be increasingly self-directed.

In view of the discussion about the two approaches to teaching writing, and taking into account that most students in our universities have a poor English language background, and therefore have difficulties coping with academic demands (the reason why the CSU was established in the first place), I believe that there is a need to try the process-based approach since this would attend to student needs by giving them more attention. The suggestion to focus on the process of writing has sometimes been interpreted to mean ignoring the product.

This is not a correct interpretation because focusing on the process means attending to the process *in order to improve* the product. It is an addition to what was already in focus, not an alternative to it.

The process approach to the teaching of writing is based on the view that writing is a learning process. Before looking at a specific writing course, I will first briefly discuss what I mean by saying that writing is a learning process.

5. From Learning To Write To Writing To Learn

5.1 Learning to Write

Learning to write is what happens as students become aware of the process of choosing a topic, struggling with a draft, trying out the draft on a partner, then editing and re-writing. When learning to write, students must not only learn to come to terms with new subject matter, but at the same time they must continue to wrestle with the process skills, including all the intricacies of spelling, sentence formation, smooth sequencing of ideas, etc. These are still difficult demands of learning to write for SL or FL students, even when they write on familiar self-chosen topics. For this reason, when learning to write students need to be supported and encouraged to work on their initial drafts in order to refine the content and consider the form their writing might take. This is where the importance of the process-based approach comes in: the need for the teacher to focus on students' writing while they are writing (rather than when they have finished writing), to help and guide them through their writing, particularly in FL situations like the one that prevails in Tanzania.

5.2 Using Writing as a Learning Strategy

Before students can use writing as a learning strategy they need to be accustomed to choosing their own topics, 'publishing' their writing in class, and so on. They are thus continually engaged in refining their skills of composing, editing, reading, and presenting. When they get to this stage, they need to go further: to use the developing writing skills for an added purpose—for learning in the subject specialist areas. The decision to use writing as a means of learning in the subject areas like maths, social studies, engineering, etc., needs to be accompanied by a resolve on the teacher's part to be seen as a resource, a guide, a trial audience, one who will instruct and assist in the matter of writing conventions, and who will ask clarifying questions on matters relating to content. Writing to learn is what happens when all those process skills are focused on the task of making sense of new information. The interplay between

knowledge and language is the theoretical justification for using a process approach when teaching writing skills, and for viewing writing as a learning process.

In the next section I will discuss a course in which we have been attempting to put into practice the process approach to teaching writing in a situation which also involves writing to learn.

6. The Case of CE 499

CE 499 is a course code for the fourth year engineering projects of which the report writing course offered by the CSU is a component. The aim of the course is to assist students write better reports. These reports form part of their engineering degree. To achieve the aim of the course we sought the cooperation of specialist lecturers to help with problems of content, and to be aware of special writing needs of the civil engineering department. The involvement of the engineering lecturer is likely to have a positive effect in convincing students of the importance of writing in engineering - that the Faculty of Engineering (FoE) values writing and takes it seriously.

The nature of the course is such that it is practically oriented in that students learn to write by performing/doing writing tasks, discussing and presenting to the class their written answers, and holding further discussions on presented tasks. Originally the report writing course used to run very much like other CL courses, with course materials to be covered during the course which meant less writing practice. In the current course we decided not to use the course materials except for reference purposes. We did this in order to allow students to spend more time on writing activities by working on their reports rather than working through course materials.

While attempting to achieve the overall aim, there was also the additional aim of making writing a social activity, i.e., by first providing students an environment that increases contact with, and supportive collaboration from, their colleagues during the actual writing process; and secondly, by involving lecturers more actively in students' writing process through discussion with students about problems arising out of writing, the nature of those problems, and ways of overcoming them.

6.1 Assumptions Underlying the Course

When the course was started, several assumptions were made. One of them was that, writing, like most other skills, is learned through practice, as Lewitt says:

Lectures don't teach writing: they display the teacher's opinion about writing. Unsurprisingly, writing, and more writing, and then more writing, teaches writing (Lewitt, 1990).

The second assumption was that students are less likely to benefit from writing activities done out-of-class and in isolation, but are more likely to benefit from activities done collaboratively in the classroom; and in particular by reading and commenting on their fellow students' written work. As Xiaochun puts it:

...the student is actually comparing his/her own written work to that of his/her peers when she/he is in the process of correcting others' composition. Seeing his/her fellow students' obvious careless mistakes in spelling, punctuation and grammar, she/he may be made more aware of his/her own mistakes... Also through comparison she/he gradually becomes aware that there are different ways of saying things (Xiaochun, 1990).

The other assumptions were that the presence of the writing instructor or lecturer during writing classes or workshops would facilitate faster learning of writing, and that close co-operation between CL lecturers who teach writing, and the engineering lecturers, would counter students' beliefs that writing is not of primary importance for engineers, and would thus create a smooth learning environment.

6.2 Collaborative Learning

The aim was to attempt to bring into the writing class the social aspect of writing by introducing collaborative work among students. In the first meeting students were informed that the course will focus directly on the reports they were writing, and that the course materials will be used for reference purposes only, i.e., when they felt they needed to look at them. The students were also told what the assumptions of the course were.

The first meeting was spent on the basics of report writing such as:

- How to select a research area
- How to formulate a research topic
- Method of investigation
- Investigating writing approaches
- Making an outline, etc.

Then students were set in groups and asked to write their project topics on a piece of paper, so that they could make an outline. (N.B. Some students had

already selected their project topics from the list of topics that were given by their engineering lecturer.) Before the outlines were ready, we ran out of time and students were asked to continue work on their outlines and bring them to class the following week.

In the next class students were set in groups. Members of each group exchanged outlines and held group discussions. Then the outlines were returned to the owners with comments, and each member was given a chance to present his/her outline to the group. After group presentations students were asked to re-write, and/or re-organise their outlines taking into account comments from their colleagues. In the next meeting they were given transparencies on which to transfer their outlines, and get ready for presentation to the whole class by using an overhead projector. During the presentation each student was given five minutes to present, and another five minutes for questions and comments from the other students.

Advantages of collaborative learning include giving students allowance to adjust their outlines and to perceive different ways of presenting information. Disadvantages include the time-consuming nature of group work and difficulty in administering and supervising group discussion. However, taking into account the quality of learning that seems to take place, one is likely to ignore the difficulties involved in supervising the students' writing process. Available classroom research (Allwright and Bailey, 1991) shows that learners experience a different quantity and quality of interaction in small groups than they do in large group activities in which the teacher sets the pace and takes the whole class through writing activities, lock-step, or one activity at a time. It is in group discussions and interactions that learners construct and negotiate meaning, and therefore are likely to learn more and improve the quality of their learning.

6.3 Problems

The course ran smoothly although we faced some problems. Firstly, working collaboratively was a new experience to most students, and not everyone in the class appreciated its usefulness. This lack of appreciation can be attributed to the fact that students' past experience on 'shared writing activities' or 'copying from fellow students' was probably negative. For example, Mansfield (1993) suggests that past academic training is responsible for negative attitudes towards collaborative learning in the classroom, where students were made to believe that "sharing information with fellow students was 'sneaky' and even sitting together in the library while working on a paper was suspect". One reason for this attitude is that classroom work is essentially individualistic and competitive,

so "sharing undermines the intricate grading hierarchies of pluses and minuses that identify students' standing in that competition" (Mansfield, 1993:68-83). There is need to challenge such views before collaboration, and groupwork can function positively in the teaching of writing.

The other problem is that the time for the course ended before students could begin to write their final reports. As a result it was not possible to read through and to discuss with students language and organisational problems in the students' final reports.

7. Practical Implications

In order for engineering students to take their writing course seriously there is need for collaboration with civil engineering lecturers who can help with writing problems related to content. The Civil Engineering Department could allot more time for the course, particularly after students have written their reports, so that the CL tutor can go through student reports during and after writing, or at least before the reports are submitted to engineering lecturers for marking and grading. Alternatively, the CL tutor could provide further collaborative workshops and one-to-one conferences for students even after the course time has run out so as to have the reports read by the CL tutor, and re-written or revised by the students before handing them in for final assessment. However, to do this will involve radical re-time-tabling of the engineering projects, and/or of the CSU provision. It would also mean reducing class size by increasing the number of writing tutors in CL courses.

Several times students have queried whether there was someone else going to read their report, that their lecturers already knew the formulas they were using, and therefore there was no need to include details in their reports. Such queries would seem to imply that if students were writing for their lecturers as well as for an additional audience who did not already know the information in their reports, they would write more informative reports, and write with some interest. In other words, if students were to write not just to get marks but to write for a genuine audience who would need to use the information in the reports either for taking action or for making a decision, they will be writing to meet a genuine communicative need. Writing with a genuine communicative need is likely to make students write with vigour and keenness that is natural in a genuine communication process. Therefore, in order to encourage and get students interested in writing, I feel there is need to find/create a genuine audience beyond lecture rooms; beyond the Faculty of Engineering, or even

beyond the university; an audience that would read and probably respond to students' writing with genuine interest. This need can be met by publishing students' reports in journals or newsletters that can be read by the general public.

Interaction through collaborative writing, and creating a genuine audience for students' writing, I believe, can provide a natural and conducive environment for the teaching and learning of writing just as they do in learning to speak.

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