

USING CASE STUDIES TO TEACH REPORT WRITING -- A Pedagogical Analysis

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Abstract

Students learning report writing need to feel that the exercises they do are useful both in improving their writing ability and in providing them with insight into technical writing in the real world. This paper supports earlier work proposing the use of imaginative, credible case studies and underscores the important pedagogical concept that the material taught should clearly reflect defined objectives to meet the overall aim of the course. By describing a planned unit of instruction currently being taught to senior technical students, this paper demonstrates that the instructional strategies and exercises used help students meet practical learning and skill objectives.

Background

In recent years, public and industrial pressures have made it necessary for even beginning professionals to show a degree of effectiveness in report writing. Surveys (Davis, 1975; Reeves and Delo, 1970) show that courses in technical writing are regarded by professionals as useful or vital to technical students, and the unit of instruction described here is a partial solution to that need. The prime aim defined in one of these surveys (Davis, 1975) is for work in which students "analyze a situation and produce a communication to fit the reader's needs". This instruction provides a means of achieving this aim by passing on to students report writing skills of proven effectiveness through the case study method. This paper, based on my M.Ed. curriculum design project (Davies, 1985), describes a planned unit of instruction designed specifically to meet this defined aim by using case studies.

A special term "basics" is used here to mean elementary aspects of good technical writing such as the writing process, the "learning to write" process, content generation, planning and outlining, style and formality, conciseness, document types and parts, word choice and definition, grammar, punctuation, etc. The "basic" elements of good writing (planning, word choice, punctuation, etc.) are not considered part of this unit. They are dealt with separately and are covered only briefly in the course, as these simple matters are learned mainly through reading a course text (Jordan, 1982). Any weaknesses in these basics are identified in class assignments and overcome individually or by special instruction in class.

Aim, Objectives, and Performance Criteria

Specific objectives for teaching report writing with case studies were developed by breaking the aim--developing student competence in report writing--into its elements as recommended by modern curriculum design theory (Pratt, 1980). (In other words, the situation was analyzed and a curriculum document was designed to meet the readers' (students') needs!) This theory also normally links performance criteria to the objectives, with each criterion explaining how to assess an objective. However, in teaching a multi-faceted skill like writing it is inconvenient, and pedagogically unsound, to establish such a strict procedure when the end product of the learning experience is a complex combination of the objectives. Instead students' work is subjectively evaluated by checking it first against the specific requirements for each exercise (called criterion-referenced grading), and then against a model answer or a checklist of required and desirable features. To obtain a numerical assessment of the work, we compare it with what we feel a professional writer could be expected to produce for the same exercise in the time allowed (100%).

The aim of developing student competence in report writing is divided into objectives including a knowledge of report parts; knowledge of structure, continuity, cohesion, and basics; and an ability to use all this knowledge to form clear and concise documents. Students analyze information on an assigned case through reading, thinking, discussion with peers, and questioning instructors, and then write a report. A desirable, higher-order cognitive skill objective is that the students should attempt to solve the problems presented in the case studies and make decisions by common sense, insight based on experience, or reasoning to provide a useful "answer" to the difficulties presented. Finally, to supplement the overall aim, we feel it is desirable that students take part in productive group and class discussions of case studies and co-operate in producing group reports--just as they will in industry and government.

Combining Theory and Practice

We teach report writing by combining lectures on established linguistic theory with practice in tutorials, using case studies.¹ Lecture sessions employ various didactic methods such as a formal oral presentation, informal presentation with class discussion, classroom analysis of published articles, and on-the-spot short assignments. Tutorials are student-centred, involving both small-group and individual work with instructor advice and guidance. Class sizes of up to 63 have been handled by two instructors in this way. (See Appendix.)

The case studies we use for teaching report writing consist of simple accounts based on facts and real-life events. The approach is unlike the cases presented by other authors of textbooks for writing

students, where the prime aim of the books--improving students' writing--seems to be lost in the detail of the cases (Couture and Goldstein, 1985), or where the motivation of the students to write is doubtful due to the highly fictional cases used (Field and Weiss, 1984). The participants (or protagonists) in the case situations we use explain the events in the form of dialogue, description of recalled events, and general data. This forms a record of what occurred in a deliberately random order and often in deliberately verbose and/or "chatty" conversational style. The main objective (purpose) of each exercise is to report the relevant given information clearly and concisely, in various formats and styles--and sometimes to draw conclusions from it with recommendations for solving the problem(s) presented. Students follow a suggested report format for some documents, consisting of a Title Page, Table of Contents (and a list of illustrations, if applicable), Summary, Body (with appropriate descriptive section headings), and Appendices (if necessary). Memo and letter formats are also used as appropriate.

Each case contains all the information necessary to write the particular report without any need to do further research on the technical aspects of the events described. The complete context for writing is also provided, as well as the intended reader(s) and purpose of the required document. Thus the emphasis in these exercises is on analysis, format, writing and revision rather than on understanding or finding technical details--we are unashamedly teaching a writing course, not a technical course. (Although we are technically qualified, we have enough confidence in the principles of language we are teaching to avoid shrouding them in unnecessary discussion of highly technical aspects of the work.)

A Sense of Real Problems

The cases used give students a sense of what it is like to write about a technical subject in the real world. The scenarios are based on actual occurrences, but names and identifiable data have been changed to protect individuals and companies. References are provided for background reading and an annotated bibliography is often available.

In spite of some recent writing that questions the case study approach to teaching writing because it is artificial, is ambiguous, and uses constricted word choice (Butler, 1985), we believe that with appropriate design, the case study method is a viable teaching tool for senior technical students. Our cases bridge the gap between the classroom and the workplace by using actual episodes or situations as a basis--often with an industrial safety theme, for which students append a completed WCB [Workers' Compensation Board] 0007 form as in real life. We avoid artificial, unlikely situations, and conversation, names or places that would not be encountered in the real world.

Although enough detail is given to make the case situations real, room is left for students to derive conclusions from the data given and to make their own recommendations for corrective action. Planning an

appropriate response to a case situation is often done in open classroom discussions or groups in the class, with the instructors giving guidance when requested. Assignment instructions are carefully worded to discourage inappropriate responses that are too simple or that just duplicate the given data in the same writing style. (Some students will do very little if given half a chance!) As the writing style of our cases varies too, students find it difficult merely to take extracts from the case and reproduce them without change.

The students' general technical vocabulary is expanded when our cases are used, especially those derived from technical publications, and they often learn about technological advances not covered in their formal technical studies. Students' experiences in the real world, often gained from summer employment in a technical field, are also used to advantage. They are sometimes asked to write on a topic in their discipline after adequate research and group planning. I have called these exercises cases too, because the students select a topic or keyword and then derive their own descriptive text or story about it. In such exercises the students originate all the required information while working in small groups to produce an unordered list of their common topic content--followed by individual effort to create an outline and a summary.

Student Approach

Students are asked to read through a case several times until the situation, problem and its cause, people involved, and possible solutions become clear. Underlining names and key phrases, noting irrelevant data, and listing possible conclusions and recommendations are techniques encouraged. In accordance with recent trends in technical writing (Goldstein, 1984), students are encouraged to view writing as a process. Typical writing steps suggested are as follows: considering the reader and the purpose, generating topic notes, listing major and minor content points, outlining, summarizing, preparing a draft, revising, editing, and completing. We stress, however, that writing is a reiterative process: feedback should occur continually during the steps to clarify or improve earlier work.

Some cases are used for reading and discussion only. When different analyses of a case situation are compared in class, students often find that there are several equally effective approaches, and it becomes evident that trying to apply prescriptive formulas is counterproductive. Some cases are often read before the class meets for the actual writing, while others are read and written within a single class period without prior preparation. Students' reading comprehension abilities are a factor in both situations, and emphasis is placed on careful reading of the cases to avoid misunderstanding.

Exercise Requirements

We make sure students are fully aware of the requirements for each exercise by using instruction sheets. These instructions are also useful to avoid repeating the information orally to latecomers to the class, and as a written record of the requirements. Students are encouraged to read through and improve their completed work, of course. However, to save class time, they are advised to correct it rather than rewrite it.

For the in-class writing exercises using cases, the ability to write quickly under strict time constraints is encouraged--an invaluable asset in many jobs where speed is often as important as the overall quality of the document.

Concluding Remarks

The main advantage of the case method seems to be the interest created by the cases as opposed to the relative dullness of traditional exercises. The use of real-life situations in which the principles being taught are demonstrated shows that writing skills can be learned in an interesting way. When references are given for the cases, including the source publication's name and date, the whole teaching process becomes more credible and the students seem to feel they are sharing in an investigation of linguistic principles that can help them improve their writing.

Our current use of case studies to teach a unit on report writing in a technical writing course seems to have met with success, since our students responded very positively to a questionnaire. I have expanded the term "report" to include technical documents in any form such as letters, memos, articles, proposals, summaries, and reports, because the same writing principles apply to them all. This approach has also helped convince students that the same writing process can be applied to different writing genres--that every document does not need a new approach. I am now considering how we can use cases for other units of instruction such as editing, punctuation, conciseness, structuring information, and re-entry of topics--all of which are included in the course curriculum.

A different sort of case frequently used is the one taken verbatim from well-written, published technical writing. Students seem particularly impressed by these cases--both from the point of view of how mature the writing is, and what complicated structures (logic and surprise for example) it employs. Conversely, published examples of poor writing interest students when they find they can improve them using principles taught in the course.

As the case study problems used in this unit do not have absolute or correct solutions, a reasonably adequate, well-written answer is all that is needed. And since no extra technical contribution to the case is required either, all the effort is directed towards the writing. A poor presentation cannot be masked with lengthy discussion of irrelevant technical detail.

We think the case study method of teaching may be adapted to different teaching styles and objectives--from discussions emphasizing composition and communication with different audiences, to lectures on the use of conventional document formats such as articles, papers, and reports. The mastery of the principles taught in this unit will not guarantee good reporting, but will increase its probability.

APPENDIX
A TYPICAL SCHEDULE

The unit described here was assigned 10 one-hour periods over 12 weeks of the full 36-hour course, and the following records a recent sequence followed. The periods are flexible as the instructors devote more or less time to a particular topic according to students' interest and developing understanding. Since the unit is integrated within a larger writing course, there is also overlapping and intermingling of other topics covered in different periods as it is difficult to separate them clearly into watertight entities.

Week 2, Period 1

A handout "Checklist for Writing Documents Based on Case Studies" was briefly discussed. This provided a list of helpful steps to employ when tackling the exercises. The case "A High-Rise Worker in High-Risk Construction" was also presented for reading for the next class. This was a safety case study based on a profile in the book Assault on the Worker, Occupational Health and Safety in Canada (Butterworth and Co., 1981) describing a young construction worker falling from a high-rise building.

Since the case text included different writing styles, style and propriety were then studied using a handout "A Sense of Propriety". This helped the students to know the style appropriate to the memo-report for the case. The importance of using appropriate styles and tones in writing was demonstrated through interactive class discussion by deciding the appropriateness of pieces of writing in the handout for given contexts.

Week 2, Period 2

In this tutorial, students were provided with the specific requirements for a memo exercise on the High-Rise Case. The instructions included the writer's position, the reader, the purpose of the document, supporting documents required, and relevance. The work was then done in class, with free discussion between students and with instructors, and handed in for marking at the end of the period.

A handout "Technical Description--Preparation" was given in readiness for the next week's tutorial. The document advised students to prepare to write parts of a detailed description of a physical item in their discipline, and to make their writing suitable for readers who were not in their area of specialization. I have called these exercises cases too, because students select a topic from their own experience and then derive descriptive text about it. Suggestions of topics they might wish to work on were provided, and they were asked to work in small groups of up to four on the same topic.

Week 3, Period 1

The marked memo exercises from Week 2 were returned and the common errors and weaknesses discussed in class. An answer guide was available to those students who felt they needed a model to compare their work with, and the instructors explained the written feedback on the students' work when requested.

Part of the lecture this week was based on the handout "The Writing Process in Brief", in preparation for the description exercise. It was suggested that their topics be broken into subtopics and rough outlines be prepared in advance. Students were advised to try a reiterative process when writing rather than a step-by-step one.

Week 3, Period 2

Specific writing exercise instructions were given at the tutorial. "Description and the Early Stages of the Writing Process" covered details of preparation, assignment, purposes, work pattern, and neatness. Students worked in small groups to produce first an unordered list of their common topic (or case) contents, and then a personal outline and a summary to be handed in and marked individually.

Week 4, Period 1

The first period was used for a discussion of Problem-Solving Texts and their Metastructure², including a review of a short, complete text "Complete Case Story - Liquid 'O' Rings". (Chartered Mechanical Engineer, p. 28, Sept. 1978). This described how a liquid plastic was used to seal inaccessible flanges of machines at a nuclear power station in the UK. The article was first read and discussed in detail informally by the class. A 10-minute, unannounced, in-class exercise followed in which the students used the principles they had learnt, to write first a summary of the case and then a more informative title. The work was collected for marking at the end of the period and an answer guide provided for immediate feedback.

Week 4, Period 2

For the tutorial the students were given a cartoon story "Wordless Workshop" from Popular Science. It was a technical problem-solution account described by twelve cartoon frames. Students transformed the pictorial information into a "Letter to the Editor" using the metastructure--situation, problem, solution, and evaluation--as the basis for their work.

A handout "Problem-Solving Assignment" described the aim of their letter in more detail, including the need to include all the problems, whether clear in the cartoon version or not, and any attempted solutions and reason for their failure. A tone appropriate for a relatively

informal letter and the use of an appropriate format were also required. The exercises were collected for marking at the end of the class; an answer guide was available later for students who needed a model for comparison.

Week 6, Period 1

A case "Steel With Less Energy" was used to give the students an account of a topic orally, supported only with illustrations of old and new processes. They took notes during the informal presentation, asking questions for clarification, in preparation for writing a report at the end of the week. The case was about the production of low-cost steel bars and the development by the Canada Centre for Mineral and Energy Technology (Canmet) of a new method to produce small-section steel bars by closed-head, horizontal, continuous casting. The old method was to cast ingots in large sections, then forge and roll them with reheating, but this was too costly and energy intensive. It was recommended that students spend about an hour in groups out of class, sorting, summarizing, and correcting their notes, as well as following the first few stages of the writing process, before the tutorial.

Week 6, Period 2

At the tutorial, the students were instructed to write an article explaining the detail they were given earlier. Specific instructions were listed in the handout "Canmet Process Assignment", which asked for an article explaining the details for publication in GEOS, a journal read by scientists and engineers from a wide background. Samples of the journal were available in class to illustrate the formal writing style required and the previously supplied illustrations were to be included, with whatever changes the students felt necessary. The work was handed in for marking at the end of the period, and the published article (GEOS Vol. 10(4), Fall 1981) was available as an answer guide.

At the first class meeting of Week 9, the case "A Material Handling Accident" was distributed for reading before the next class, together with a handout "Some Notes on Writing Short Reports", and direct reference was made to the case study. The use of illustrations in report writing was recommended. The case described a material handling accident in an industrial plant in which a workman's legs were injured, and was based on an Ontario Federation of Labour Training Manual Work Sheet. The notes provided guidance on report length, the use of headings, the need for a summary at the front, and suitable prefatory material. Short paragraphs and mixed sentence lengths for clarity and conciseness were recommended, while keeping the tone quite formal.

Week 9, Period 2

The second period of the week was used to review the handout "Accident Report" giving information on the assessment of this formal report assignment and the parts to be included. The assignment was

worth twice the normal assignments and was due at the end of Week 10. To ensure fairness to everyone, a system of penalties for late submission of the reports was announced and rigidly enforced. The requirements for the report included a signed title page, a list of contents, and any appropriate appended material. Students were also reminded that it would not be sufficient for them simply to report what happened, and that they should provide information about the situation, the problem(s), and suggested remedies (solutions) for future improvement in similar plants. Above all, they were asked to be clear, concise, accurate, and complete--and to try to use the techniques they had been learning throughout the course.

Week 9, Period 3

During the tutorial the students started planning and writing their reports following the writing process and clarifying points about the case and assignment with each other and the instructors.

NOTES

¹The work described here forms part of ENGD-380, Effective Technical Communication, given by Michael Jordan and the author, with marking assistance from Bob Hilderley of St. Lawrence College. Limited copies of the copyrighted instructional material described here are available on request. This paper provides enough information to allow teachers of technical writing to incorporate a unit of instruction such as this in their courses.

²Michael P. Jordan, Rhetoric of Everyday English Texts, George Allen and Unwin, 1984.

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