WRITING: FUNCTIONAL AND CREATIVE

Notes for the OECD Working Group Meeting
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These notes are intended to stimulate discussion for our November meeting in Paris. Although the structure (parts 1 to 4) is relatively fixed, since it follows a model all four working groups are using, the specific content is quite modifiable; in fact, I have not attempted to be either comprehensive or unbiased at this point, hoping instead to inspire other views and sources of information to come forth in November.

Our report will be valuable if we can answer even some of the questions posed here. It will still be useful if we can formulate these questions in such a way that they stimulate critical thinking by policy makers and practitioners. Thus, I see our task as one of providing information, but also as one of clarifying issues in a complex field.

The notes (and our subsequent report) follow a four part structure:

1. a discussion of the pedagogical context for writing independent of the technology used,
2. analysis of current technology used for teaching writing,
3. a critical look at promising areas of research and development, and
4. implications for instructional practice.

Pedagogical Context

Many of the debates about teaching methods arise, in fact, from differences about goals. For example, the question of the usefulness of grammar instruction in the teaching of writing cannot be resolved without defining what one means by "learning to write" or "being a good writer". Even in the cases in which there is agreement about methods in general, decisions about the specifics are critically dependent upon our characterizations of expertise, not to mention assumptions about developmental patterns. Thus, it is necessary in examining the use of technology for the teaching of writing to consider carefully what writing is; what distinguishes the expert, or successful writer; from the novice, or less successful writer, how children make the transition from less to more skilled in writing; and how teaching can support, enhance, or guide natural learning processes.

For the purpose of this working group, we have defined writing broadly, to include all forms of

composition (but not handwriting or calligraphy), from the most basic levels of written expression to accomplished use of written language to inform, to persuade, to entertain, to express ideas, and, generally, to communicate with others. Our working title, "Writing: Functional and Creative" is intended to convey that we should consider writing in this way, as a tool for thought and as a basic skill for learning and survival in literate societies.

Goals of Instruction: The Psychology of Expertise

Writing can be viewed from both social and cognitive perspectives. From the social perspective, we see writing primarily as a means of communication between people. Viewed in this way, understanding the audience and the purpose of the communication become paramount. Indeed, expert writers, whether observed through protocol studies or introspective writings, seem especially skilled at examining their writing in terms of rhetorical goals, e.g., "Did I answer possible objections to my argument?", "Will the lead-in to my story catch the reader's interest?", or "Have I motivated my exposition well enough for the type of reader I expect?". Research questions follow from this view: How do experts develop such skills? Should the teaching of writing encompass notions of audience and purpose?

In addition, the social perspective leads us to see the production of text as a typically collaborative act. Just as this very document is the product of many discussions with others and is but one phase in the production of our final collective report, most adult writing is embedded in social settings. Expert writers are therefore not just expert at putting words to paper, but at listening to others, interviewing, discussing, arguing, analyzing, synthesizing, and, generally, engaging in collective as well as solitary intellectual work. Again, questions need to be raised; How are these skills learned? How well do schools prepare students for writing in adult contexts?

From a cognitive perspective, writing appears as an immensely complex act, one essentially inseparable from general thinking and learning. Writers must generate and collect ideas, organize, prune, and revise them. Moreover, they must produce text with attention to all levels from word choice to overall text organization. To complicate things, text production and idea generation are not easily separable, for ideas arise during the process of creating text.

What makes certain writers experts? In simplest terms, they know more--more words, more ways of expressing ideas, more forms of text organization; they are more skilled at applying their knowledge; and they have better strategies for putting everything together and even going beyond what they know. It is this third capability, having strategic skills, that brings the cognitive and social perspectives together. As we examine new technologies for teaching writing we will need to keep in mind these aspects of writing expertise. What other characteristics of expert writing should be consider?

Learning to Write

Consideration of what expert writers do and how they develop their expertise leads to one disturbing conclusion: Much of what is called "writing instruction" in schools is far removed from what adult

writers do. Typically @foot(My comments here pertain to the U.S. experience and obviously need to be rethought for the overall OECD situation.) schools have focused on writing as a solitary act of text production, not real communication. Moreover, the emphasis on text production has been on the smallest units: vocabulary, grammar, punctuation, and capitalization. Far too little attention has been paid to writing as a thinking process or to higher levels of discourse organization.

Over the last 15 years or so there has been a resurgence of research on learning to write, which has documented these practices and also pointed to alternative approaches. But a host of questions remain: Where should schools focus their efforts in teaching writing? To what extent can (and should) schools try to create environments for meaningful communication? How are the rhetorical skills of expert writers best learned?

Writing Instruction

Recent years have also seen the spread of the "process" approach to writing instruction, which emphasizes pre-writing activities, conferences, revision, and publishing of students' writing. In some cases, process writing programs seem to have been successful at enhancing not only the learning of writing, but also the learning of other subjects by emphasizing the use of writing as a learning tool. Yet often, "process" has become another form of "product", with teachers following rigid specifications about the number of drafts needed for an essay or the way brainstorming must be carried out prior to writing.

Meanwhile, many schools either ignore writing or reduce it to instruction in grammar, spelling and vocabulary. One fact seems indisputable: If children do not write, very few will develop good writing skills. But what should they write? And how much? How much should teachers guide students in choosing topics, audiences, purposes? Where in the wide realms of idea and text production should instruction reside?

Technology to Date

In order to discuss current and future technologies for teaching writing, and to examine the match of technology to pedagogical need it may be useful to adopt a (admittedly imperfect) taxonomy of software. I would like to suggest the following:

I. TUTORING SYSTEMS

A. Drill and Practice B. Frame-based CAI C. Mixed initiative CAI D. ICAI

II. MICROWORLDS

A. Games B. Simulations C. Intelligent Microworlds

III. TOOLS

A. Word Processing B. Idea Processing C. Data Bases D. Communication E. Graphics F. Spreadsheets

IV. PROGRAMMING LANGUAGES

A taxonomy such as this suggests types of software to consider in relation to the pedagogical needs suggested in Section 1. For example, one might guess that tutoring systems, especially ICAI, would be most effective at addressing aspects of text production. On the other hand, data bases or communication systems might be most useful in getting students to understand the communicative function of writing.

What current software satisfies these or other desiderata for teaching writing? Are there evaluations of writing software that have general applicability? Which promising areas have been overlooked? What software not explicitly designed to teach writing could nevertheless be successfully used to do so?

Promising Areas of Research and Prototype Development

The OECD note by Alan Lesgold (CERI/NT/85.04) describes ten areas of promising research. We should consider each of these as it applies to the teaching of writing. In addition, there may be other areas such as the following:

> Computer Languages for Language Play. Systems such as GRAM (Sharples), ITI (Interactive Text Interpreter, Levin), ILIAD (Bates), and even the early MENTOR (Feurzeig) offer the possibility of exploring language by creating new language forms. LOGO, for example, usually classed as a means of learning geometry or computer programming, may have its greatest potential for learning about language. (It originated from LISP, a language designed for list processing and symbol manipulation).
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> Communication Software and Networking. Communication via computer is now common in the adult world; it may also be a powerful way for children to learn about writing by communicating to others far away, even in other countries. The QUILL MAILBAG facility is an early attempt at this, but the possibilities are just unfolding as networking becomes more accessible. Already, CCNN (Computer Chronicles News Network) allows students in various parts of the world to share news articles they have written and to "pull" news items from around the world for use in their class newspapers.
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> Idea Processing. Programs such as THINKTANK and NOTECARDS allow students to work at the idea level, not just with linear strings of words as in traditional word processors. Will such programs help writers or writers-to-be? What other types of idea processors could be developed?

Implications for Instructional Practice

Introduction of new technology of any sort is never as easy as the developers anticipate. But in the area of writing there are two special hurdles to consider. First, for many teachers, writing is a

humanistic activity for which technology is inappropriate. Researchers, administrators, and policy makers typically think of writing last in considering the use of computers, despite several years of successful use of word processors in schools. Second, some of the most promising uses of writing software fall into the tool category, which directly implies a greater involvement of the teacher in using the software, and hence, greater demands on teacher training.

Are there other instructional practice issues to consider? How will the teaching of writing change because of the introduction of computers? If professional writers use word processors, data bases, communication software, idea processors, and graphics programs, should the use of such machines be part of the standard writing curriculum?