
At the Turn of the Millennium: Communication Technology and ELT*

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This paper argues the need for pedagogic change reflecting the communication technology revolution. It has been argued that the present curricula in Communication Skills should undergo vital changes to cater to the training needs of a developing community. The gap perceived in the potential of the communication technology and its use is significantly wide, and the communication skills training professionals have a critical role to play towards bridging this gap. The desired changes would radically alter not only the teaching methods, teaching materials and assessment patterns but also the fundamental approaches to syllabus development systems.

1. Background

Language teaching, as a profession took an early note of the developments in communication technology. Computer-Assisted Language Learning (CALL) has been thriving as an independent field for the last two decades. The ELT materials industry has seen a rapid increase in the language enhancement software. Several universities have incorporated computer-assisted writing as an integral part of their curricula. A number of language teachers have taken courses in computing and there is a wide awareness of the use of communication technology in everyday teaching. Multimedia laboratories have taken over the conventional language laboratories.

Against this background I wish to propose that language teaching in particular, and

communication pedagogy in general, have missed a few vital aspects of the growing communication technology. Despite the professionals' initial enthusiasm in CALL, the practitioners gradually lost track of developments in communication technology. An excellent review of CALL in teaching writing is found in Bridwell et al. (1984). Even though somewhat dated, the review mentions features that can describe most of the CALL software even today. First, much of the work is of drill and practice variety and even though we see some flashes of innovation, they are considerably narrow in scope. For instance, Burns's (cited in Bridwell, 1984) *Fine Invention Programmes* are really only one kind of invention exercise for writers, hardly enough for a comprehensive curriculum. There are a few

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fully developed programmes (such as *Writer's Workbench*) but they put a heavy and unrealistic emphasis on editing, which is only one aspect of writing. Secondly, some other good programmes do not allow the teachers the flexibility they are accustomed to in the work of print materials. Since teachers are not able to pick and choose from the materials as easily as they have been doing in the case of the print materials, they quickly grow weary of such programmes. More importantly, word-processing in itself has not been studied widely for its effects on composing and revising processes. The small number of studies in this area (such as Bridwell, 1984) have not been put into curricular practices. In general, some of the CALL materials seem to be using the old, mechanical age platform and there seems to be a dearth of software based on information age thinking.

1.1 Extension and Transformation Approaches

From a broader perspective we find that professionals involved in communication pedagogy have conceived the information technology as a mere set of tools. The potential of word-processing to transform the very nature of the book and of authorship was ignored until recently. A word-processor has been viewed simply as an efficient device to allow writers to print their own manuscripts and manage the layout. The following words by Stillman are sufficiently representative of this attitude to information technology.

But this machine is not my inamorata; I do not love it any more than I love my chainsaw. It hasn't radicalized the way I write, made it markedly better, or me any less lazy. No machine can do that. It hasn't made me any smarter either, although I had hoped it would, considering what it cost.

(Stillman, 1985:19)

At the end of his article, Stillman puts computer to its place and shows us its 'value'. *Does all this justify a two thousand dollar investment? Not of itself, perhaps. But I would hate to go back to a conventional typewriter. My printer will ready this manuscript in less than ten minutes. It would take me most of the day to type it out. If you write a lot and charge yourself the minimum hourly wage for typing time saved, you can pay for such a machine in couple of months.*

(Stillman, 1985:28)

With hindsight, such a narrow view of the impact of technology on writing seems disastrous. It unrealistically tries to merely append the technology to the existing curriculum and is clearly an Extension approach. This Extension approach is blind to the fact that technology has a more radical impact on social behaviour and on-line communication will change the writing philosophy that is at the very basis of our curricula. A more recent manifestation of the Extension approach is seen in the latest editions of Communication Skills textbooks that attempt to bring in the new technologies. Tragically, most of the portions in the earlier editions are kept intact, and only a few activities on e-mail and web page designing are included. A case in point would be the latest edition of *Business Communication Today* (Bovee and Thill, 1998). While the edition includes quite a few e-mail based writing activities, chapters such as *Writing Bad News Messages* are unchanged from the previous edition. This represents a prevalent attitude towards e-mail as merely a tool or medium to carry the written messages. The questions that remain unexplored are: Does the on-line communication change the structure of writing? Has writing become

more like talking? If the conventional writing strategies presume a time gap, shouldn't the e-mail, as instantaneous, paperless communication, be radically different from letter or memo writing?

We then realise that these questions are not limited to e-mail, but are also relevant for other forms of on-line communication such as Web pages. Consider the following activity that occurs in the above textbook at the end of a chapter on Visual Aids.

Because of your experience with creating and designing presentation materials, your company asks you design its web page. No one else in your company has the technical expertise to help you, so you begin by searching the Internet....

Now try your hand at Web page design, and print a copy of your sample home page for submission.

(Bovee and Thill, 1998:531)

The writers do not find it necessary to deal with the grammar of web pages. They act on the belief that web page designing is merely an extension of the well-accepted design principles in the on-paper communication. They seem to believe that apart from the principles of on-paper communication, what on-line communication requires is a nuts-and-bolts expertise that the students can either acquire on their own or learn in a computer class. There could not be a better example than this of the abdication of responsibility on the part of the professionals teaching communication skills. In the second section of this paper we discuss how such an abdication is professionally unethical, how the on-line communication skills are radically different from on-paper communication and how the communication pedagogy needs to change not

merely to accommodate but to absorb and assimilate the communication technology.

2. Pedagogic Change: Some Directions

2.1 Dynamic Writing

It might be said that the world of communication pedagogy was caught unawares in the wake of the rapid expansion of communication technology. One reason for this was the rapid rate of change in the technology itself. The PC was introduced less than twenty years ago. Within this short span of time we have moved from huge, cumbersome machines with several limitations to hand-held speed demons with user-friendly graphic interfaces. More significantly, the Internet and the World Wide Web have opened a new era in interpersonal communication. They have brought along numerous possibilities such as e-mail, on-line conferences, on-line publishing and on-line discussion forums.

Writing has been characterised for ages by its deferral from the immediate present. With the advent of on-line communication writing has become "written speech". The electronic revolution did what some thinkers had always longed for. It freed writing from its static features and made it more dynamic. John Locke was one of the thinkers who were weary of viewing books and writing as containers of 'truths'. Books, according to him, are not absolute sources of knowledge, but are likely to be repositories of falsehoods and superstitions as of truths. Locke was aware that the very form of the books, by fixing, tends to reify the information prescribed in it (Nidditch, 1987). The book in the future, we might expect, will be free from such fixedness.

More radically, hypertext and the new media reduced the sharp distinction between reader and writer. Hypertext is a non-linear (or *multi-linear*, as some authors would prefer) form of digital textuality in which electronic links join different pieces of text. The pieces could be audio, video or graphics. This mode permits the readers to move through a text creating their own paths. The readers thus construct the text and a hypertext can have as many versions as the number of readers. A part of the writer's power is thus effectively transferred to the reader. Along the same line, the Web opened up and (arguably) 'democratised' the publishing act. It cannot be denied that the non-linearity of hypertext and the on-line publishing have challenged the very basis of our literary system. Several thinkers have raised voices against 'authorship' and have argued that unlike physical property, ideas and information can not be owned. In one sense hypertext and on-line publishing have posed serious challenges to the conventional authorship and have recognised the reader's power of text construction.

The on-line forms of writing also destroyed the dichotomy between the book on one hand and 'other' forms such as newspapers, leaflets, brochures and pamphlets. These 'other' forms are not taken as seriously as a book in our literary system. Possible reasons for this are pointed out by Constant (1814) in the following words.

All enlightened men seemed to be convinced that complete freedom and exemption from any form of censorship should be granted to longer works. Because writing them requires time, purchasing them requires affluence, and reading them requires attention, they are not able to produce the reaction in the populace

that one fears of works of greater rapidity and violence. But pamphlets, and handbills, and newspapers are produced quickly, you can buy them for little, and because their effect is immediate, they are believed to be more dangerous.

(Cited by Hesse, 1996: 27)

The main difference between books and other forms of literature, Constant suggests, is the time taken by these forms in their writing and publication. Word-processing and on-line publishing have bridged this gap significantly and have placed all written forms at par in this respect. The philosophy of writing at the basis of the existing communication pedagogy is deeply influenced by the presumed permanence of the book form. It is however clear that the form of the future book will be radically different and this has created a need to reform our pedagogy. The field, on the other hand, has chosen to undermine the advances of technology and defend the present form of the book. This attitude is reflected in the quotation below.

Books are forever, says author: Fiction Pulitzer Prize winner E. Annie Prolux says that the information highway is for bulletin boards on esoteric subjects, reference works, lists and news- timely, utilitarian information, efficiently pulled through the wires. Nobody is going to sit down and read a novel on a twitchy little screen. Ever.

(New York Times, 26/5/94. Cited by O'Donnell, 1996: 37)

While Prolux seems to undermine the present communication technology ('twitchy little screens'), we can observe the speed with which the technology is improving itself. As communication professionals, we can not ignore the fact that CD-Rom has already eaten

into the sales of encyclopedias, that a number of books exist on-line. A look at Internet sites shows that this is not the same writing we have learned and we are teaching. The electronic space has changed the nature of writing. The impact of electronic space on the nature of writing has been adequately summarised by Bolter in the following words.

Every written text occupies physical space and at the same time generates a conceptual space in the minds of writers and readers, the organisation of writing, the style of writing, the expectations of the reader- all these are affected by the physical space the text occupies.

(Bolter, 1996:273)

As Herbig and Kramer (1992) point out, such technological advances can cause 'innovation overload' and this is what has happened in other quarters in the communication field. Here the technologies seem to be driven by technologically infatuated systems developers. These professionals are more interested in the technology rather than the practical applications of the technology. The developing communities however, demonstrate growing training needs that only the communication pedagogy can fulfill. Even with its graphic user-friendly interfaces, the cyberspace is still a complex world. If the academicians choose to highlight this complexity and denounce the technology to undermine its impact on their world, it would hardly be a professional gesture. The onus of making the cyberspace more communicative is on the communication pedagogy. We discover a huge ignorance of communication principles when we see hypertexts that look 'out of control'. The writers have more technological power, but many of them have little knowledge of how to apply the

technology in a purposeful way. It is a concern frequently expressed that on-line publishers have the tools but not the training to be on-line writers or publishers. Just because the writers have a control of fonts, rulers, borders and colours, the results are not always communicative. A look at the on-line publishing many times shows that these are not true electronic books, but rather printed books that have been transferred electronically. What it means is that the writing that was conceived and planned for on-paper communication has been put into a computer-readable form. This is hardly an adequate use of hypertext, since the reader can not take control of such text. Communication teachers usually assume that learners will immediately and automatically engage with hypertext, once they grasp the principles of on-paper writing. As we have seen in this section, the on-line communication is different in its essence and needs a new set of pedagogical principles.

2.2 Reading Hypertext

Grice and Ridgway (1995) point out the following features that make hypertext different from on-paper text in terms of reading and accessing information.

1. Without taking the time to understand the writer's context, we can seek out specific bits of information and can place them immediately into our own contexts. Students therefore have to be aware of the possibility of misinterpretation. We are in fact accustomed to such non-linear access (in printed books), however some students may have an adjustment to make.
2. Finding the information depends on successful search strategies (keyword

searches, narrowing the fields, following the right links) which are often independent of the type of information being sought.

3. Research on reading from a screen shows differences in people's reading performance. Students also need to adapt to the different conventions involved in hypermedia accessing.

Most of the reading curricula are based on the systematic relationships between basic measures of cognitive processing and measures of reading performance. It would be therefore interesting to see whether these relationships change significantly in the case of hypertext. A correlational study reported by Wegner and Payne (1996) demonstrates that these same relationships can be observed in hypertext. At the same time, correlations among spatial processing abilities and performance with hypertext support the idea that spatial and relational processing play important roles in reading and using a hypertext.

Experience with using hypertext systems for learning has revealed a number of problems and critical issues. (See Cunningham et al., 1993; McKnight et al., 1993.) Based on this research, I wish to propose an agenda to initiate discussions on a *hypercurriculum* that we would wish to see implemented in the near future. The agenda is preliminary and not meant to be comprehensive. It however highlights the peculiarity of reading skills required of professionals in a developing community.

1. Search Skills

Search skills become crucial in the hypertext context since the context involves a change in

the reading pattern from reading as we traditionally think of it to a mode of accessing. In this mode the reader searches for pieces for information and ignores (sometimes tentatively) surrounding information. It might be argued that such a strategy is also relevant for the paper domain; however the difference lies in the fact that the hypertext writer intentionally constructs the text in a manner that facilitates such tentative bypassing of surrounding information. This very structure of an electronic document demands a new set of search skills of the reader. Guthrie's (1988) model for locating information in print documents involves the following tasks.

- (a) Specifying the target information to be acquired by the search, together with all its constraints and parameters
- (b) Deciding which structural features (e.g. chapters or sections) of the text being searched will be relevant search destinations for this target information
- (c) Extracting the appropriate details from each relevant destination
- (d) Integrating the details extracted and evaluating whether they meet the target specification set earlier
- (e) Recycling from (a) if the evaluation at (d) is negative

As Wright (1993) points out, the major difference in the case of on-line documents will be the computer support available which may change the way some of the sub-tasks are carried out. For example, the availability of text string searching and of combinational searching may influence how readers use the structural features of the text. It might be argued that hypertexts can involve an extra subtask between (b) and (c) since readers not only decide where to go but also how to get there.

2. Navigation Skills

The issue of hypertext readers getting disoriented or 'lost' in the process of navigation has been discussed frequently (Hammond, 1993). Such disorientation is attributed to the information base being considerably wide and the use of unfamiliar structure. Even in a 'good' hypertext, the provided links may not be suitable for all individuals and for all tasks. Readers may also have problems in locating the specific bit of information they know is present. They may also face the challenge of determining whether a certain piece of information is likely to be present in a particular text or site. Research literature on this issue provides some evidence that getting 'lost' in a hypertext is different in kind and degree from getting lost in a paper text. The main source of this feeling of getting lost is due to "not knowing where to go next" or "not knowing where they were in relation to the overall structure of the document" (Edwards & Hardman, 1989). Hypertext readers also find it difficult to gain an overview of the material (Hammond and Allinson, 1989). McKnight et al. (1990) found that readers of word-processor and paper versions of text spent significantly less time to retrieve information than the time spent by readers of hypertext.

3. Selection skills

It has been pointed out (Cunningham et al., 1993) that by offering a number of choices, hypertexts place greater demands on the reader. These demands can be expressed in terms of three types of complexity: managing oneself in the complex learning environment, facing conflicts with one's intuitive models of the world, and adapting to the new approach to reading at the same time one is working

with the content domain. There is also the issue of readers being unsure of selecting a link that will lead to a particular piece of information.

Readers who might lack selection skills will soon feel 'lost' and disoriented in a hypertext. They might have little clue regarding finding the information and relating the information found to the rest of the text. In an experiment reported by Hammond and Allinson (1989) individuals were asked to explore a small knowledge base for a fixed time using a variety of hypertext tools. After twenty minutes of use, they were asked how much of the material they thought they had covered. Users of the basic hypertext version (without facilities such as maps, index and overview) thought that they had seen the most material when in fact they had seen the least. This has been such a common phenomenon that the technology itself is blamed for it. Readers would rather prefer to print an on-line text and read it on paper. However, this would mean losing the advantages offered by hypermedia environment.

4. Text Construction Skills

The complexity of hypertext is merely another side of the constructivist environment it creates and the power that it places in the hands of the reader. As we have noted earlier in this paper, hypertext has reduced the distinction between the reader and the writer and during the navigation process the two roles almost become one. Communication professionals have been underlining the value of evaluative reading for decades and this aspect becomes much more meaningful in the reading of hypertext, where the readers are able to construct their own texts according to their needs. The reader therefore needs to

develop effective strategies for thinking about a problem and pursuing information on that problem in a hypermedia environment. In the paper domain the writer and the reader engage in an activity of production of meaning with a larger framework (or 'point of view') provided by the writer. We will have to consider whether this power of the writer (to provide a point of view) remains shielded in the hypertext environment. As Cunningham *et al* put it

Of course, if an individual constructs the network of nodes of information, that network will be as much a reflection of that individual's point of view as the organisation of a book is a reflection of the author's point of view. Points of view are essential. If all perspectives and contexts were taken into account, everything would be linked to everything else and the hypermedia information environment would be unusable.

(Cunningham et al., 1993:32)

Our experiences with hypermedia are still limited and it remains to be seen whether a growing number of nodes and links essentially place the power of providing a point of view in the hands of the reader. Unlike books, hypermedia environments impose no constraints in terms of a linear, cohesive presentation. There is thus considerable freedom for the writer and the reader, and even though the writer might have built the network with a certain point of view, it would be unrealistic to expect the reader to see through or share the writer's point of view.

2.3 Writing of the Future

The writing of the future is likely to be different from two perspectives. First, there will be a widespread use of on-line paperless

writing. This writing, due to its instantaneous delivery, has to be different from the writing in the paper domain, which is characterised by deferral in time and place. Secondly, the writing philosophy will change as the nature of the book and publication change. The following features of the new writing have already been established in the practices in the modern workplace. Writing pedagogies therefore need to change not only in terms of using computers for teaching writing, but broadening and recomposing the parameters of our writing philosophy.

As we saw in the previous section, with the emergence of hypertext, the on-line writing will mainly consist of nodes of information. It also relies highly on machine-supported links between these nodes and a common user interface. The implication of this is that on-line writing is likely to be more discrete than the texts in the paper domain. The users of e-mail generally tend to send short and cryptic messages as compared to writing letters. In an on-line text such as a web-site the writer does not have the burden to provide a point of view to the reader (although no meaningful text can be created without the writer having a point of view) and thus can create chunks of text which are joined with hyperlinks. These links are certainly different from the cohesion and coherence strategies used for the paper domain. In the paper domain, the reader is led from one point to another and the writer is in greater power than the reader. If readers of paper domain avoid to read a section by avoiding a coherence link, they are likely to miss the essence of the text. The hyperlink creator, on the other hand, creates a multiply structured document that leaves the text construction in the reader's hands. Our writing pedagogy and writing practice in the paper domain rely on comprehensive and linear

texts. The pedagogy for on-line writing is likely to use small, discrete texts with multi-linear structures.

The need of training and education in this area is obvious to those who have encountered some of the several unstructured hypertexts. Hypertext writers who are not clear about the readers' needs or about the structure of their own text are likely to overuse and misuse the opportunity to create links. As research shows, readers of hypertext benefit from the guidance of implicit or explicit structures, and flounder in unstructured hypertext (Williams, 1992).

The multi-linearity of on-line communication also has a direct bearing on the teaching of report writing. The current report writing pedagogy leaves little scope for an on-line reading of the report. In fact, modern word-processors have excellent capabilities such as hidden text and a dynamic table of contents that facilitate production of on-line reports. It is definitely easier to search for a specific information when the report is read on-line. However, if the report is written in the paper domain format and is merely transferred to the computer, the reading may not be easier. Professionals thus tend to make hard copies of all on-line documents and defeat the objective of achieving a paperless office. This failure on the part of the professionals is directly related to the inadequacy of communication pedagogy in terms of its absorption of on-line communication principles. The pedagogy is still restricted to the unified text paradigm, and needs to build a new paradigm for discrete, multi-linear and multiply structured texts.

The breakout of the visual is the next aspect of the writing of the future. Traditionally,

writers themselves were not responsible for the appearance of their documents. Computers have placed the designing tools in the hands of the writers and, as a result, have given them a new role and a new responsibility. Apart from the layout of and design of documents, it is clear that electronic communication will generally adopt more and more visual codes. Writers will have to decide on proper semantic images to emphasise the meaning of their texts. Experiments have been reported in new ways of communicating poetry and this has questioned the present methods of composing and interpreting literary texts. Landow (1996) reports re-creation of a poem by Brecht. In this re-creation the reader encounters a white screen, shading in the lower fifth part to increasingly dark shades of gray. Moving from right to left of this screen appears in turn each line of the first stanza of the poem.

*My brother was a pilot
He received a card one day,
He packed his belongings in a box,
And southward took his way*

Fonts, colours, tones and moving text continue to re-create the poem as an effective and moving piece. Apart from the emergence of a new art form, the experiment has serious implications for the nature of business and technical writing. Business presentations have already started using capabilities such as animation and simulation. This extended textuality is very useful to present statistical and technical data. Most of the experiments in this area show that the major value of technology lies in developing skills to convey information that the paper domain can not.

Along with the use of televisual writing codes, the new writing pedagogy will have to focus a

great deal on reader-oriented writing. On-line writing generally has multiple structures for multiple reader-audiences. The writer must also choose visuals, styles, content and tone to match the varying needs of the different kinds of readership. It might be said that the writing strategies taught today do include reader-oriented writing. However, Williams (1992) aptly points out the difference.

Traditional documents are built with the notion of writer-oriented reading. The reader is guided by the writer; the reader discovers what the writer intended; the reader consumes what the writer has provided. Whilst the writer has, necessarily, taken account of the readership, it has been relatively passive reader who has been looked to, a reader who receives the writer's offering and accepts or rejects it, but who otherwise does not interact with the text or the author.

(Williams, 1992:14)

While conventional writing strategies assume a text written by a single author and read by a relatively homogeneous audience, the new writing is for an audience the writer does not know. It will generally be multi-authored and the writers will have to work as members of a team whose membership they may or may not know. Collaboration is the new task that the writers will have to handle, which will need establishment of new conventions. In the modern interactive classrooms, the writing output will have to be shared by e-mailing it to the partners or posting it to news groups and bulletin boards. Such sharing patterns provide an immediate feedback to the writer. Conventional writing strategies, on the other hand, depend on writer's imaginary conversation ("anticipating the reader expectations") with the reader. Newman and Newman (1992) point out in their work on the

modes of collaborative authoring that while computer aids to writing are increasingly being used by individual authors, remote on-line collaborative authoring remains quite rare. The existing forms of remote on-line collaboration are motivated by enthusiasm, rather than by intrinsic benefit. Newman and Newman (1992) analyse the entire process of co-operative writing and lay down important agenda for curriculum designing in this field. They have identified three modes of collaborative writing (*Literature, Documentation and Critical Discourse*) in terms of the type of text produced and the relationship between that text and the negotiated construction of reality.

There would also be a greater change in the pedagogy in terms of diction. While the current pedagogy depends on a distinction between writing and speech, the new pedagogy will be based on "talky writing" (Daiute, 1985). The language of e-mail, bulletin boards, news groups and many hypertexts tends to be informal and emulates the relative simplicity of speech. The pedagogy will have to make sure that the decision of a writer to make the writing informal is deliberate and the effects are intended. Once this is ensured, *talky writing* can actually be just an extension of our drive to make the writing readable.

Next, the ability offered by the word-processors to use the same text in different contexts without retyping would create a new set of problems. These problems may be multiplied by the scanning facilities that can scan any text and make it available for editing, and by the several thousands of pages of digital text available on our desk tops through World Wide Web. This has created issues related to copyright and ownership.

Conscientious teachers would also face the problems of plagiarism on the part of their students. However, the crucial point is that there is no need to create an 'original' text, if the same communication can be achieved by editing an existing text. Thus more and more edited texts may replace the originally written texts and this will bring in an era of reusable writing. To satisfy the needs of this era, the writing pedagogy will have to train the developing communities in producing reusable writing.

Finally, there is also the *Ephemeral Writing* (Williams, 1992) that the writers will have to master. This term refers to the large chunks of hypertext that may never be read, bulletin board and news group messages which may live in the system for a very short period and the electronic messages that are deleted without being read. Thus the long, well-structured documents prepared leisurely will soon become out of fashion and the cryptic, short texts written like a speech, in collaboration with a team that put these pieces together will become a trend in vogue. Williams (1992) appropriately summarises the skills needed of this new writer.

Writers will need the skills of summary, the skills of minute taker; the skills of brevity and immediacy, taking the reader by the throat in the first time and saying all that need be said in the time it takes to find the next entry on the system, the skills of the writer of advertising copy; the skills of abbreviating and stitching together fragments of texts from different sources...; the skills of the magazine editor.

(Williams, 1992:16)

3. Conclusion

The paper began with some comments on Computer Assisted Language Learning. As

the name indicates, CALL merely took the 'assistance' of computers to implement the conventional agenda in language learning. The main changes that CALL brought about were at the level of methodology and techniques. In this paper we discussed how the cyberspace changes the philosophy and principles of writing that are at the very basis of the present curricula. The proliferation of new communication technologies serves many needs of the writer. At the same time, new forms of writing have emerged and the writers face new challenges.

The features of the new writing that we discussed above take us far beyond the present practices of using computers as 'tools' in the language learning classroom. They imply far-reaching changes in the roles of the teachers, materials producers and curriculum designers. The teacher's role would change from the role of an experienced writer (as it is viewed today). Materials producers will have to base their materials on the new writing philosophy and consider making them available on-line. Considering the dynamic nature of these writing technologies, the nature of curriculum design process itself will have to change. A curriculum can no longer be viewed as a relatively static entity and a new 'on-line curriculum' may be on cards. The nature of this pedagogical change has been speculated by some researchers. Wickliff and Tovey (1995) present a rational and method for introducing a hypertext authoring assignment in a professional writing course. They describe a rhetorically centered pedagogy that incorporates portfolio assessment, collaborative authoring and real world projects for teaching hypertext within the context of situated problem-solving theory.

Due to the limited scope of this paper, aspects such as oral communication skills and group dynamics were not discussed. These are two vital areas where the communication technology will have an equally deep impact. An approach that does not undermine the impact of technology and at the same time does not suffer from *innovation overload* is

likely to survive in the end. Finally, to answer the question posed in the title of this paper, we may quote Johnson (1995:15) from his article on hypertext:

My question is not if there will be a change, but what that change will mean.

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