

Chapter 5

USING COMPUTERS TO PROMOTE LITERACY DEVELOPMENT

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ABSTRACT

Computers have become powerful tools and important resources in education. While the computer can be useful in teaching the two traditional aspects of literacy: reading and writing, it also creates a new literacy, which requires a paradigm shift in literacy education. The choice of computer-based teaching and learning experiences greatly depends on the literacy education perspectives adopted by the teacher as literacy teaching is pedagogically theory-driven. This chapter starts with a presentation of the main perspectives of literacy, which will become a basis for the discussion of the use of computer in literacy education. Word processing and the World Wide Web are specifically highlighted in this discussion as computers make these resources available for use in education.

Key words: computer-based teaching, literacy education.

INTRODUCTION

The term computer is not just a word to describe a certain type of hardware. When one says he or she is computer literate, it means that he or she not only knows how to turn the machine on or off, but also can master the information technology in association with it. In this chapter, the term computer is used interchangeably with the term “information technology”. In its generic meaning, computer is metaphorically viewed as a new paradigm of technological advancement, which permeates virtually every aspect of life in Western societies. Fisher (1994) argued that computers have given users a power not widely understood till now - the power to break the enforced linearity of information, if not of time. In education, computers have been used to assist teaching and learning. Terms such as on-line

teaching, virtual university, computer-based learning (CBL), and computer-assisted language learning (CALL) indicate the strong presence of computer technologies in education.

In literacy education, the computer is both a common tool and a powerful resource for teachers and students. It can be used constructively to enhance literacy awareness and literacy skills such as spelling, grammar, editing, creative writing and critical reading. However, computers also create a new literacy discourse or what some call a multi-literacy, which is considered by some to be different from the traditional print literacy. It poses a new challenge for teachers to ensure that students are empowered to function in the digital world.

This discussion examines the use of computer in enhancing literacy development with a focus on the two most popular and powerful tools: word processing and the World Wide Web (WWW). Before examining in detail the role of the use of computers in literacy education, it is important that the discussion of its role should be situated in the current discourse of literacy teaching. That is it is important to consider how computers are used in the teaching and learning of literacy. We argue that this role is dependent to some extent on the literacy education perspectives that are adopted by the teacher. The inclusion of literacy perspectives in this discussion gives insights into why and how the chosen current computer technologies are used to enhance literacy development.

LITERACY EDUCATION PERSPECTIVES AND COMPUTER TECHNOLOGY

There is a wide proliferation of educational software to promote language and literacy development. Numerous educational software packages have constantly been introduced by commercial companies, educational services, and teachers themselves. They can be grouped into speaking, listening, reading, and writing. Some software cover combined language skills and others are aimed at improving a specific literacy skill such as spelling, punctuation, or syntax. The main problem is that software packages tend to convey a selling message to teachers that their products work. Teachers should develop some awareness of the evaluation criteria for deciding which educational software items, packages, or tools are appropriate to their education principles and their perspectives on teaching and learning of literacy. Those who adopt a constructivist perspective of teaching literacy tend to consider factors such as promoting independent learning, intellectual curiosity, communicative interaction, and problem-based learning; whereas those who emphasize the important role of literacy instruction may choose software that is highly structured, specific-task-orientated, and drill-and-practice-based. The discussion starts with an overview of literacy education perspectives, which will be the basis for examining the use of computer technologies in literacy teaching and learning.

THE TRADITIONAL PERSPECTIVE

The traditional perspective advocates “back to the basics” in literacy education, including teaching phonics, grammar, punctuation, and regular testing. The transmission mode of teaching is adopted where structured instruction is crucial. Grammar lessons are introduced to drill learners with language exercises such as subjective mood, preposition, subordinate

clause, spelling rules, etc. Products such as a completed essay, stories, or poems are treated as essential in judging language and literacy achievement. In this model, language and literacy intervention is most important.

Literacy pedagogy has traditionally meant teaching and learning to read and write in page-bound, official, standard forms of the national language. Literacy pedagogy, in other words, has been a carefully restricted project – restricted to formalised, monolingual, monocultural, and rule-governed forms of language (Cazden et al., 1996, p. 66).

The implications for using computer technologies in literacy education, include:

1. Using computer technologies to teach specific literacy skills such as spelling, vocabulary, sentence combination techniques;
2. Using computer technologies to test learners' literacy skills;
3. Computer-based drill-and-practice is important in learning.

THE PROCESS-ORIENTATED PERSPECTIVE

This perspective emphasizes the active role learners bring to the learning task and it argues that learning is not a knowledge-acquisition process, but primarily a developmental one. Thus, the role of instruction is very minimal in this orientation as teachers' role is to facilitate the learning process, not to dictate it. Since teachers are facilitators, they are concerned about catering for the individual needs of the learners and ensuring that a positive learning environment is established. There are three prominent views/orientations under the process-orientated perspective: the process-writing orientation, the psycholinguistic view of reading, the natural-language-learning orientation, and the whole language movement.

Implications for using computer technologies in literacy education:

1. Promoting editing skills with the use of word processing;
2. Encouraging risk-taking behaviour in learning literacy with computer technologies;
3. Promoting collaborative and interactive learning among learners, for example, group work on a literacy task such as writing a project report with the use of Web-search.

THE GENRE-BASED LITERACY PERSPECTIVE

This is an interventionist approach to literacy education. Literacy learning is not always an effortless process and it could be an up-hill battle for many learners. Teachers are no longer merely facilitators and they must take an active part in teaching literacy. Knowledge is conveyed through different genres determined by culture. Genres can be seen as cultural 'procedures' used appropriately according to communicative goals. Thus, there are different genres such as narrative, report, recount, explanation, argument, etc. Genre competence is an essential part of literacy development.

Implications for using computer technologies in literacy education:

1. Using a variety of e-texts to illustrate different genres;
2. Promoting computer-based discussion of various text types;
3. Writing to different audiences for different purposes, for example, writing emails to other students, writing to an agency to seek certain information;
4. Developing task-based activities in teaching genre construction.

CRITICAL LITERACY PERSPECTIVE

Literacy instruction traditionally refers to the teaching of basic literacy skills —reading, writing, listening, and speaking; whereas the critical literacy perspective is mainly concerned about the socio-cultural aspect of education, particularly the injustice and imbalance of the educational discourse. Literacy education cannot be divorced from its socio-cultural context. According to Comber (1994) literacy practices are not in themselves neutral, but work culturally and politically to privilege particular kinds of literacies and therefore particular kinds of literate students. According to Luke and Freebody (1999), there are four necessary aspects of reading competence: code breaker (coding competence), meaning maker (semantic competence), text user (pragmatic competence), and ext critic (critical competence). Text critic is the focus of critical literacy as it requires the ability to deconstruct the text and identify the meaning, motivation and ideology embedded in the text.

Implications for using computer technologies in literacy education:

1. Critically examining e-texts to identify surface meaning and hidden meaning;
2. Developing critical thinking to discern meaning from an array of e-texts and the virtual environment;
3. Promoting collaborative critical inquiry among learners with the use of Web-search;
4. Using Web-based forum for critical discussion.

COMPUTERS IN LITERACY EDUCATION: THEORY INTO PRACTICE

Computers can play a crucial role in the educational discourse of Information Communication Technology (ICT). Terms such as Computer-Based Learning, E-Learning and Computer-Assisted Learning are interchangeably used to designate the role that computers can play in learning. Computers are powerful tools for teaching and learning that can be used from early childhood to tertiary education and in face-to-face instruction for in a virtual school (Le & Le, 2002). A traditional use of technology is skills reinforcement; for example, students who need additional practice in reading might work individually on computers equipped with reading-comprehension software. An authentic use of technology is using it as a tool to accomplish a complex task; for example, students who are creating a written report might use the Internet for research, word-processing software to write and format the text, and hypermedia software to add images (Holum & Gahala).

There are numerous computer-based tools or items that form a vast instrumental basis for computer in general and literacy education in particular. Thus, instead of embarking on an endless task of discussing tools and software in literacy education, this part of the discussion focuses on the two widely-used computer technologies for literacy development which are commonly available in schools and other educational institutions. They include the use of computers for word processing and for searching on the Internet.

WORD PROCESSING IN LITERACY EDUCATION

The Word Processor is the basic and widely used tool in a rapidly changing world of computer technology. When first launched, word processor packages were mainly used as a replacement for the typewriter. A word processor is a powerful tool that performs many functions and tasks. In order to appreciate the power and user-friendly features of word processing in children's writing process, it is useful to compare it with the traditional use of pen and paper. In a traditional context of children's writing, the challenges faced by learners are:

1. Using paper and pen for writing is a slow process and it could be difficult for some.
2. Problems with spelling. Some children interrupt their writing till they find the correct spelling for a word. Some rely on phonetic spelling to continue with the task of writing, for example, "My skool is nise", or " My friends laf at me wen I sing".
3. Grammatical errors which are unnoticed unless teachers give feedback immediately, for example, "Many dog are in the park", or "People buyed cakes in a garden". Teachers' immediate feedback seldom occurs in a crowded classroom.
4. Mental blocking occurs when a child does not seem to know what to write next.
5. Children wanting to re-arrange parts of a text and feeling discouraged to do so as they have to write it again.
6. Not having the original text if the child would like to make changes.
7. Good content, but very poor form or appearance of the passage.

Word processing will eradicate all these problems or at least minimize some problems by facilitating the writing process. Features such as grammar check, spell check, paste, delete, font and size are very useful and simple to use. Word processing can enhance children's literacy in terms of language functions (or meta-functions). Halliday (1987, 1991), one of the founders of Systemic Functional Linguistics, developed a theory of the fundamental functions (or meta-functions) of language, which are useful for teachers in using word processing to enhance writing development in schools. The three functions are:

1. The ideational function is about the natural world.
2. The interpersonal function is about the social world, especially the relationship between speaker and hearer, or writer and reader.
3. The textual function is about the interconnectedness of the text.

These three functions are facilitated by the use of word processing in writing development. The following discussion examines the three functions and the role of word processing in writing development.

THE IDEATIONAL FUNCTION

When children use word processing to write something, they might want to convey their perception and understanding of the world in which they live. Through writing, they can describe, explain, discuss, and comment about things and events in their world. Ideational

function reflects children's cognition. Writing with the help of a word processor gives children a chance to represent and reflect on their own experiences. This can also happen with the use of pen and paper. However the process can be very slow and interruptive; whereas the use of word processing facilitates the flow of their 'inner speech'. Children feel free to allow their thoughts to flow in words and after the text has been created, they can use the word processor to improve the form or presentation of expression.

THE INTERPERSONAL FUNCTION

In a traditional teacher-centred context, children write mainly for the teacher to evaluate. Thus the concept of 'audience' is very narrow. In the process-writing perspective, children should be encouraged to write for different readers or audiences with different purposes. The interaction between the writer and the reader reflects the interpersonal function of texts. Writing a birthday invitation to a friend is different from writing an inquiry to an official. With the use of word processing, children should be encouraged to write to a variety of audiences. They may use the same content in a text to create different new texts for different purposes.

THE TEXTUAL FUNCTION

In a traditional literacy class, sentences are normally dealt with in isolation. A text written by beginners or young children tends to be rather inconsistent, particularly when children are not skilful in using punctuation. Thus the text is incoherent as different linguistic units in the text do not hang well together. For example 'Tim did not go to school, he was sick.' The relationship of the two clauses in this sentence is not linguistically established. The use of punctuation or conjunctions such as 'because', 'when' or 'as' help to link the two clauses to become a single unit. This is textual function, which is important in writing. Fluent writers are very aware of this function. Word processing is useful in developing textual function in children's writing. Children should initially write down what they think and later they may improve the textual coherence by editing the first draft.

WORD PROCESSING IN PROCESS WRITING

Teachers who are orientated towards product writing tend to treat the final products or output of children's writing as the most important part of writing. This is the reason why assessment of writing is based on children's final product. In real life, writers do not write a text in a simple single act. According to the Writing Process perspective, normally writing goes through several stages: pre-writing, drafting, revising, editing and possibly publishing. Word processing is the ideal tool for teachers to use in teaching process writing. Its flexibility and multifunctional features are suitable for all the stages in the writing process.

In the pre-writing stage, students work individually or in small groups to brainstorm the topic. The ideas can be typed as a point-by-point text in a word processing file. The next step is to re-arrange the items into an outline, which will later be written in paragraphs. Using

word processing features such as *Copy, Delete, Paste, Format, Grammar* and *Spell Check* enables students to go from the initial stage to the final stage of the writing process. The final product of writing can be printed in different styles and formats and many copies can be made for students, teachers, and intended others. A special feature of modern word processing is the provision for text comments embedded in the text created by students. Students can also use this device to comment on each other's writings. Thus students learn both writing and editing skills.

ELECTRONIC COMMUNICATION FOR LITERACY DEVELOPMENT

One of the innovative contributions of computer technology to education is e-communication. There are two main types of e-communication: synchronous communication and asynchronous communication. The former designates communication that occurs instantaneously, in real time. Participants are engaged in communication at the same time such as e-chat and telephone talk. The latter designates communication which is delayed at the receiver's side. E-mail and discussion board are asynchronous communication activities. In education both synchronous communication and asynchronous communication play an important role in students' literacy development.

How does e-communication enhance literacy competence? Literacy is not merely an encoding and decoding process. It involves social interaction and meaning making. Firstly, participants in e-communication make some commitment to the process: there must be at least two people to communicate and each participant acknowledges the others' involvement. As an interactive process, e-communication is not just a linear process starting from the speaker and ending with the listener. It involves initiating, receiving, exchanging, interpreting, modifying, etc. Secondly e-communication enables participants to make sense of the world: the physical world, the human world and the inner (spiritual) world. Through communication, participants discover the world around them; understand other people and most importantly it is an inward journey to discovering themselves.

Email has permeated interpersonal communication, organisational communication and mass communication. It has its own discourse of communication, which includes the email terminology, email grammar, email etiquette and email members. We may refer to these aspects under the node 'email genre'. As email is a system of communication, it has its own terminology, which is simple and unambiguous. For example the following terms are universal and unambiguous: send, receive, mailbox, inbox, outbox, trash, etc. Each term is assigned to its clearly defined function; thus 'forward' is different from 're-direct' in email transferring. Email also has its own 'functional grammar'. In other words the email message has its structure and function. An email should have a 'subject', 'sender', and 'receiver'. When a reply message is constructed, responses can be inserted within the original text (which can be shortened or modified) or at the end of the original text. The text can be in the form of a letter, short conversation (i.e., texts with subsequent replies), public announcement (large audience), and advertisements (mostly unauthorized emails).

In a study conducted by Lê and Lê (2004) on email communication between students and teachers, ten functions of emails were identified. They were grouped under three major clusters: procedural, social and cognitive.

Cluster 1: Procedural Function

- Confirming: confirming a certain procedure (to be on right track);
- Requesting: asking for something, for example, borrowing lecture notes;
- Complaining: complaining about a certain procedure;
- Clarifying: wanting to clarify a certain procedure.

Cluster 2: Social Function

- Greeting: mainly students introducing themselves;
- Referring: discussing another person;
- Thanking: thanking teachers;
- Complimenting: praising someone;
- Sharing: sharing their life experiences.

Cluster 3: Cognitive Function

- Discussing: explaining, arguing, discussing.

The study revealed that e-mail communication in an educational context (e.g., between students and teachers) tends to be limited to the procedural function and there is little attention to either the social and cognitive functions. However the three clusters of functions are often present in email communication in a variety of social contexts. The inclusion of pragmatics in communication is a contribution to functional literacy, which focuses on aspects of literacy which enable people to function in complex society. In dealing with email for literacy enhancement in classroom, teachers should expand the use of emails to cover a variety of communicative functions as this not only enriches children's communicative interaction in the real world but also develops their writing competence in handling different genres.

THE WORLD WIDE WEB IN LITERACY EDUCATION

The Web can be one of the most powerful tools for providing teachers and learners with necessary conditions for independent and interactive learning (Barker, 1996; Laurillard, 1993). It provides an educational discourse in which learners can interact widely with other members of a learning community; at the same time the learners are in control of their own learning. Their learning interaction can be immediate, prompted, widely shared, and resource-supportive. This may not be possible in a traditional mode of teaching in which teachers and students are heavily constrained by the physical condition of a classroom.

Teaching and learning via the Web present different dynamics in a different discourse. Tyrell (1998) suggests that educators can use the Web in teaching to empower students. Similarly, Staples (1998) views the Web as important in education as it enables teachers and learners to create an educational paradigm to empower student-centred learning. The new discourse of teaching and learning via the Web creates a different process which cannot be derived from traditional face-to-face teaching. Jonassen (1996) uses the Web for scaffolding in case-based reasoning.

The Web is a powerful resource for literacy education. It provides a range of learning experiences for students to explore the world of literacy without completely relying on the traditional print materials. This may be particularly important for students in a disadvantaged environment. The Web is useful for inquiry-based class projects in which students are introduced to literacy-orientated skills such as data collection, data analysis, critical reading and writing in a variety of genres (Bertram, 2003).

The proliferation of multimedia in general, and the Web in particular, has drastically changed the nature of the discourse of literacy. The rapid development of multimedia and its popularity requires new thinking about this new form of literacy, which is more dynamic and multidimensional than the traditional print literacy. The term 'multiliteracies' was introduced by the New London Group (Cazden et al., 1996) which, from a combined perspective of Critical Literacy and Critical Discourse Analysis, argues that the multiplicity of communication channels and increasing cultural and linguistic diversity in the world today call for a much broader view of literacy than portrayed by traditional language-based approaches. Learning processes need to recruit, rather than attempt to ignore and erase the different subjectivities that students bring to learning. They include interests, intentions, commitments, and purposes. Cope and Kalantzis (1997) expressed a view on active engagement of students in multiliteracies that considered:

Being active participants in 'social change' means that we develop questions around values, identity and power as a part of the construction and deconstruction of multiliteracies in texts. When we focus on multiliteracies, we keep in mind the importance of cultural contexts in what we are seeing, viewing, hearing and interpreting. We ask questions and listen to different points of view around the kinds of 'social futures' we envisage for ourselves in our community and in our world." (South Australian Literacy and Numeracy Network, p. 1)

Thus the Web can be used to present to students various forms of text and teachers can use the Web to develop multiliteracies. which represent a literacy paradigm shift from the traditional print literacy.

CONCLUSION

In the Western world, computer technologies permeate every aspect of life and education, from the lowest to the highest levels of education and across subject areas. In literacy education, computers are a powerful source for developing children's literacy competence. In addition, a computer is not just a tool for teaching and learning literacy, it expands the traditional concept of literacy into a different paradigm of literacy which poses new challenges to teachers and students from early childhood to tertiary education. As indicated by Zammit and Downes (2002) being literate in today's society and in the future is more than just being able to read and write the written word. With advances in technology and the inclusion of technology in educational settings students are reading and viewing an increasingly complex and diverse range of multimodal texts. Literacy and learning in these new environments requires students to be multiliterate.

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