

Using Media in Teaching

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The SAIDE Teacher Education Series

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for Distance Education

Using Media in Teaching

Learning Guide

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SECTION SEVEN

Using computer technologies in schools

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What will we do in Section Seven?

7.1

'What I remember of computers at school was when we were once called out of class to a mobile truck that had about ten computers in it. The computers were on and this guy explained some stuff, but we weren't allowed to touch because the next class was already waiting.'
(Grade 12 learner, Mitchells Plain)

'My Grade 2 class sends e-mail messages to learners in the United Kingdom. They all have pen pals and practise reading and writing through their letters.' (Teacher, Johannesburg)

'With a computer and Internet in every home, who needs schools or teachers?' (Parent, Durban)



You should now begin Week 19 of your studies. This means you have spent at least 108 hours on this module. This final module will probably take you more than the remaining 12 hours if you spend time playing the CD-Rom. However, we strongly recommend that you do this!

Computers in schools: hype or help?

Computers have rapidly become a familiar part of our lives. In many cases, computers (and the Internet) are spoken of as a new miracle cure to our educational problems. If only it were that simple.

Throughout history, new technologies have been hailed as miracle cures.

When television was first introduced, many people believed it would take education to the masses and solve problems of illiteracy, and so on. It didn't. After an initial period of optimism about its educational potential, educationists started criticising television for being educationally restrictive because it did not allow for two-way communication. Today we have a more sophisticated understanding of what television can and cannot do. We recognise that television won't solve all our educational problems, but that it is a useful resource on which teachers can draw.

The current optimism about computers makes it easier to find funding for projects that involve computers than it is to find sources willing to contribute to teacher development or basic infrastructure, such as toilets, chairs or chalk. Computers and the Internet are 'cool' and easy to generate enthusiasm about. As with television, though, we need to view such enthusiasm for computers critically: we can't ignore the impact that computer technologies are having on our society, but we shouldn't believe they will solve all our problems.

ACTIVITY 52

Turn to part 6 on your audio tape. Listen to some teachers and educational technology experts talk about the educational potential offered by computer technologies, as well as the pitfalls. Make notes as you listen.

Why use computers in schools?

How are computer technologies currently used in South African schools? And why is it important for all teachers to consider their use?

Computer literacy is basic to our survival in modern society

Computer technologies are increasingly an essential component of any office or work environment. Even where we do not need to know how to use computers, it is useful to know how they work. For instance, cashiers at supermarkets ring up our purchases using computer technology; when we draw our money from ATMs we use computer technology; our microwave ovens measure their cooking time using

computers: we live in a computerized world. In order to live **socially useful lives**, we need to become computer literate. Even where learners don't actually learn to operate computers, they need to *understand* the role and functions of computers. In many ways it could be argued that *computer literacy* is becoming as important as the ability to read and write.

Employment opportunities increase for those who are computer literate

As computers become so widespread, so more and more of us will be directly employed in computer-related work. In this case, learning to operate computers is an important competency for all school leavers. In some cases the level of skills will need to be fairly advanced, but in other cases we may just need the skills to do basic word-processing. For instance, the writers of this module are not computer experts, but have learnt to write this module using a computer. So, there is a good **vocational reason** to learn about computers and how to use computers: it will offer better opportunities for employment.

Computer technologies provide a powerful resource for educating

We can learn from computers. Computers function as a source of information, and can be used to expose learners to topics and experiences beyond the classroom walls. Many people have argued that computers will replace teachers in classrooms because they can provide access to so much more *information* than any ordinary teacher can ever know. They can also be programmed to respond to every individual learner's answers, so their *teaching* is also superior – at least in some ways – to that which most ordinary teachers could provide. However, we will show that although computers are an important educational resource and will change the ways in which teachers need to be able to teach, they are unlikely to replace good teachers.

Computer technologies are facilitators of change in other areas

We said earlier that computer technologies are likely to change the ways in which teachers teach and schools function. Computer technologies are **catalysing change** (bringing it about in other spheres) in many parts of our society. For instance, banks have changed because of computers. ATMs would not be possible without computer technology. Computers are symbols of change. More importantly, they are driving massive changes in schooling. For instance, the growth in home schooling is a direct result of the availability of educational resources online. Teachers' roles as conveyors of information are also being challenged by computers, which do this far more effectively than we can ever do!

Arguments against using computers educationally

There is still opposition to using computers educationally in a country like South Africa. The substance of the opposition relates to issues of access and equality. Teachers say that there are more urgent things to be addressed in schools than getting computers. 'How can we think about computers in our schools when we do not have running water, toilets, textbooks or chalk?'

According to the 1996 Survey of School Needs, only 8% of schools reported having two or more computers. Only 38% of schools have grid electricity and exchange line telephones – the minimum necessary infrastructure to run computers. This makes the widespread use of computers difficult. It certainly puts into doubt the idea that computers can be some kind of miracle cure!

These are powerful arguments. The stark reality is that few teachers or learners have computers in their homes or their schools. Nevertheless, it is also the reality that some schools and homes do have them, and that new educational and communications policies prioritize the provision of computers and the Internet to historically marginalized communities.

These inequalities, though, do raise important questions that we need to ask ourselves as we consider the use of computer technologies in schools:

- What does this unequal access to computers do to our society?



This categorization of 'rationales' for computer use – social, vocational, pedagogic and catalytic reasons – was introduced in 1993 by Ely, D. 'Computers in schools and universities in the United States of America', in *Educational Technology*. Vol 33(9): 53-57. This is a fascinating journal to read if you are interested in theoretical perspectives on using technologies in education, although most of its papers and case studies are based on experiences in the USA.

- How does access to computers privilege some learners and disadvantage others?
- How does the introduction of computer technologies change power and knowledge dynamics?
- Is it possible that a new societal divide – not only between 'the haves and the have nots' but between 'the knows and the don't knows' – will emerge?

These are not easy questions to answer. Implications of computer- or technology-related changes in society are complex. People concerned with equity push to increase public access to computers (at libraries, multi-purpose community centres, and at schools). These concerns have led our government to create an enabling policy environment that encourages projects that increase public access to computers. Nevertheless, implementing policy is a slow and difficult process – we can expect public access to computers to increase, but inequalities in access are likely to persist for the foreseeable future.

With this reality in mind, we have included a short unit on assisting your school to get computers. We know that this is not adequate. Nevertheless, we also realise that it would be futile to throw up our hands in despair and wait until all schools have access to computers before focusing on them in a module such as this. We must look to the future and begin to prepare for an environment where we can assume that every South African learner will have access to a computer.

ACTIVITY 53

Imagine you are at a school that does not have any computers. A Grade 10 parent comes to you at a parents' meeting saying: 'What is happening at this school? My sister's child is using computers at her school and knows a lot of things. My child is embarrassed to say that she has never switched one on. What is happening here - when are things going to change?' How would you respond?

Desired learning outcomes

By the end of this section, you should be able to:

- explain why computer technologies have educational and social significance, but also what their educational limitations are in a country like South Africa;
- explain the different ways in which computers are used in society;
- explain what it means to be computer literate;
- assess your own literacy and that of your learners, and devise ways in which you can improve your own and your learners' computer literacy;
- integrate the teaching of basic computer literacy into the teaching and learning of all subjects;
- use computer technologies to improve your administrative efficiency;
- explain the benefits and limitations of using CD- Roms in your teaching;
- use a CD-Rom programme to teach, and develop lesson plans around these;
- explain how the Internet works;
- access educational resources on the Internet (or World Wide Web);
- use the Internet in teaching, and design lesson plans to do so;
- explain how e-mail works;
- use e-mail as a teaching, communication and administrative tool



Do this activity with a couple of other teachers. Spend about 30 minutes on it. Brainstorm! Try and think as imaginatively as possible. This parent is 'difficult' and won't accept simple answers suggesting that investing in computers is 'simply impossible'. You will need to provide convincing reasons why it is impossible – if this is so!

We don't respond to this question immediately. But you may want to return to it when you have completed this section; you should have more answers then.



Checking your learning:

How should you use these outcomes? You may find that they don't mean much *before* you study the section. That's why it is so important to check back regularly. Ask: 'Have I achieved any of these outcomes yet? What do I still need to learn in order to meet these outcomes?' Write down those things you still think you need to learn, and use them to focus your learning.

7.2

Ways of using computers



This is another 'brainstorm' activity. Spend about 15 minutes on this activity and, ideally, do it with a group of teachers. Justify your choices! Again, you may want to return to check your answer once you have completed this section.

ACTIVITY 54

Someone donates ten computers to your school. From what you know about computers, describe three or four ways in which you would use these computers (i.e. what would you use them for?).

Each person doing the above activity would respond differently. There are so many ways in which computers can be used. It may help you to organize your suggestions by grouping them. One way of grouping them would be to go back to the reasons mentioned on pages 209 and 210 – social, vocational, pedagogical and catalytic. For instance, if a reason for computer use is *pedagogical*, then a way in which a computer could be used is as a teacher. We have grouped uses in a slightly different way, but one that overlaps with the earlier 'rationales'.

We will explore how computers can be used as:

- an *administrative tool* that makes all sorts of work processes more efficient;
- a *teacher (or tutor)* that provides us with new ways of educating learners; and
- a *learner (or tutee)* – software that we can programme to do things.



This simple distinction was introduced by Taylor in the 1980s in Taylor, R. 1980. *The Computer in the School: Tutor, Tool, Tutee*. New York: Teachers' College Press, and it still has relevance nearly two decades later.

Computers as administrative tools

Human beings have manufactured tools throughout history to help them do their work. We have simple tools such as hammers, sewing needles, wheelbarrows and pens, through to more complex machines such as cars, video recorders and newspaper printers.

Computers are simply the most recently developed tool. Like all other tools, they were developed by human beings in order to assist us with our work. They can do some things well, and other things not so well. They can, for instance, be used to assist in tasks such as typing and bookkeeping that would otherwise be done manually. But in order to help us with various tasks, computers need to be *instructed* as to what they must do for us. Computers only work according to these instructions that, in computer language, are called *software programmes*.

As with other tools, it was not long after they had been invented that computers and various software packages were manufactured in large numbers by numerous companies. Thus, in the same way as a *transporting tool* such as a motorcar comes in a number of different brands – Ford, Toyota, Mazda, BMW – so similar software programmes manufactured by different companies have different names. For example, if we want assistance with typing, we need to buy word-processing software. But we have a choice: while one company – Microsoft – manufactures a word-processing package called MS Word, its competitor, WordPerfect, will try and sell us WordPerfect 6. Both are similar *tools* – they assist us with word-processing – but, as with motorcars, each company's brand adds a few features that would make its software slightly different from that of its competitors.

Have a look at this table to see some of the different types of computer products that can be used to help with different tasks:

Task/Purpose	Tool	Brands
Type notes, newsletters, correspondence, worksheets, tests, examinations	Word-processor software package	MS Word, WordPerfect, Word Pad
Bookkeeping, records, budgets	Spreadsheet software package	Quattro Pro, Excel

Draw pictures and diagrams	Graphics package	Paint, MS Image Composer, Paintbrush, Corel Draw
Keep records and catalogues of contact details, library books, or sales	Data base package	Access
Give a speech, lecture or slide show	Presentations package	PowerPoint or Presentations

ACTIVITY 55

There are lots of these software packages. Perhaps you can think of other 'brands' or 'tools'? We suggest you visit a computer store next time you go shopping. Examine what kinds of programmes they have on their shelves. Speak to an assistant and ask:

- What kinds of computer 'tools' (or software) do you have available? Suggest what kinds of things you would like the computer to help you with, such as recording students' marks, teaching reading, or something else.
- How many different brands of each tool do you carry (or know about)? List these.
- What are the differences between the different brands? What do you recommend, and why?



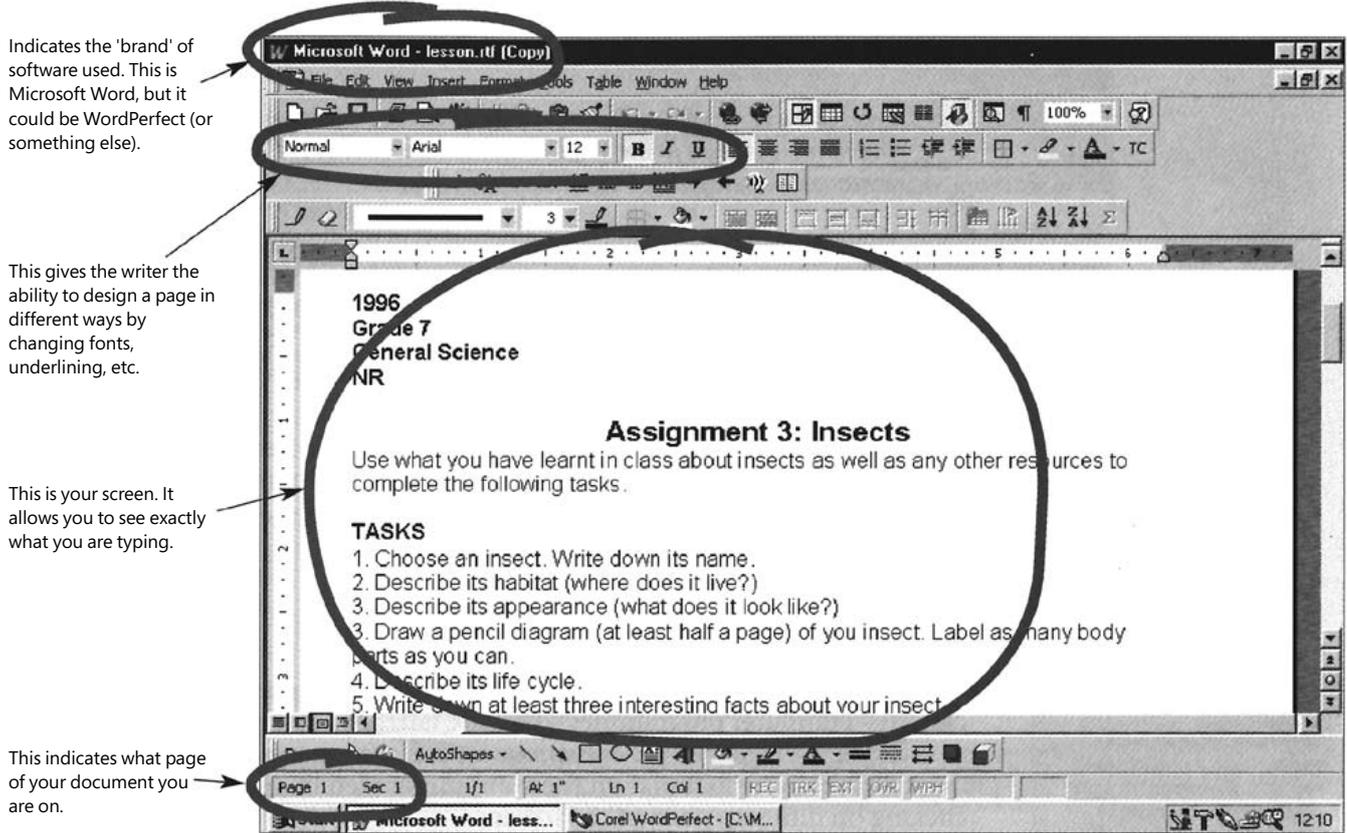
Spend about an hour on this activity. The main aim is to start to familiarize yourself with the computer software available to you.

All these packages are designed to help with tasks. They do not give you information or content on what to write about, how to budget or what to put into your slide show. As such, they are sometimes referred to as '*content free*'. They can be used by teachers and learners as tools to assist with school tasks. They can also be used to create mark schedules, reports, tests, work-sheets, assignments, notes, and general correspondence (for example, letters to parents or confirmation of sporting fixtures).

These functions are not new additions to teachers' workloads because they are done manually or by an administrator in the absence of computers. The advantages of using a computer is that teachers are able to:

- *automate some of the processes*, for example, working out averages or percentages using a spreadsheet rather than a calculator, thereby making their work more efficient;
- *improve presentation*, for example, by typing handouts or correspondence in order to look better and more professional than hand-written ones;
- file outputs electronically, *thereby allowing for easy retrieval and minor changes to be made* without substantial additional effort.

Word processing (or 'typing') worksheets is probably the administrative function most frequently used by teachers. By typing a worksheet – like this one on insects – on a computer and saving it on a disk, a teacher saves an enormous amount of time. For instance, this teacher could simply go back to this worksheet in 1997, change the date, add or remove a question, and then print out the 'new' and updated worksheet for her class!



Using computers as an efficiency tool is the most common use, even in schools with a good computer infrastructure. Kearsney College has a staff workroom with nine networked computers, together with CD-Roms, printers, a scanner, a digital camera and direct Internet access. These computers are used only by the staff. An extra teacher has been appointed to offer technical assistance. With all of this infrastructure and support in place, a study found that the computers were used mostly for word-processing of notes, tests and examination papers. Internet browsing and e-mail correspondence were the next most common uses.

Often, new users of computers find that the difficulty of using a computer or new application does not seem to justify the added effort. Learning a new computer programme can be frustrating and difficult but, as you become more computer competent, you will find many advantages. For example:

- If you keep the contact details of your learners and their parents, and a record of all correspondence electronically (in other words, on computer), the tracking of student progress and dealing with parents can be handled far more efficiently.
- Worksheets, tests and assignments stored electronically can easily be changed to suit different classes or be updated across years.
- Marksheets stored electronically allow the quick and easy recording of marks and progress, as well as the conversion of marks to percentages.

Not surprisingly, using a computer as a *tool* to support these management and administrative functions of a teacher's role is the most common use of computers in schools.

Computers as teachers or tutors

'My teacher showed us the extra science notes on computer. I read all the notes and then answered the tutorial questions. It's like having a textbook on computer, but less boring.' (Matric science learner)

'I don't mind the multiple-choice questions in the exams. I have practised so many questions on the computer. What is nice is that I know right away whether I got it right or wrong.' (Grade 7 learner)

These learners are talking about computers operating as *tutor* or *teacher*. Computers can do this in two ways:

- They can operate as new 'teachers' or textbooks where a great deal of methodological design skill is involved in the development of software.
- They can operate as a giant 'resource centre' that both teachers and learners can access and learn enormous amounts from.

Using programmed educational texts

Obviously the computer cannot think. *People* have designed software applications – computer programmes – that are taught to present content (such as notes and diagrams) to learners in a particular manner. Learners then move through the material on the computer screen by using a mouse and clicking on different parts of the screen.

ACTIVITY 56

***NOTE:** The references in this activity are out of date and the CD-Rom is not available. But the activity has been kept as an example.

Click on Educational Resources on your CD-Rom. You will find a list of samples of programmed educational resources here. Click into the two multimedia education group tutorials (on race and racism, and numeracy). Imagine that your learners have access to these programmes.

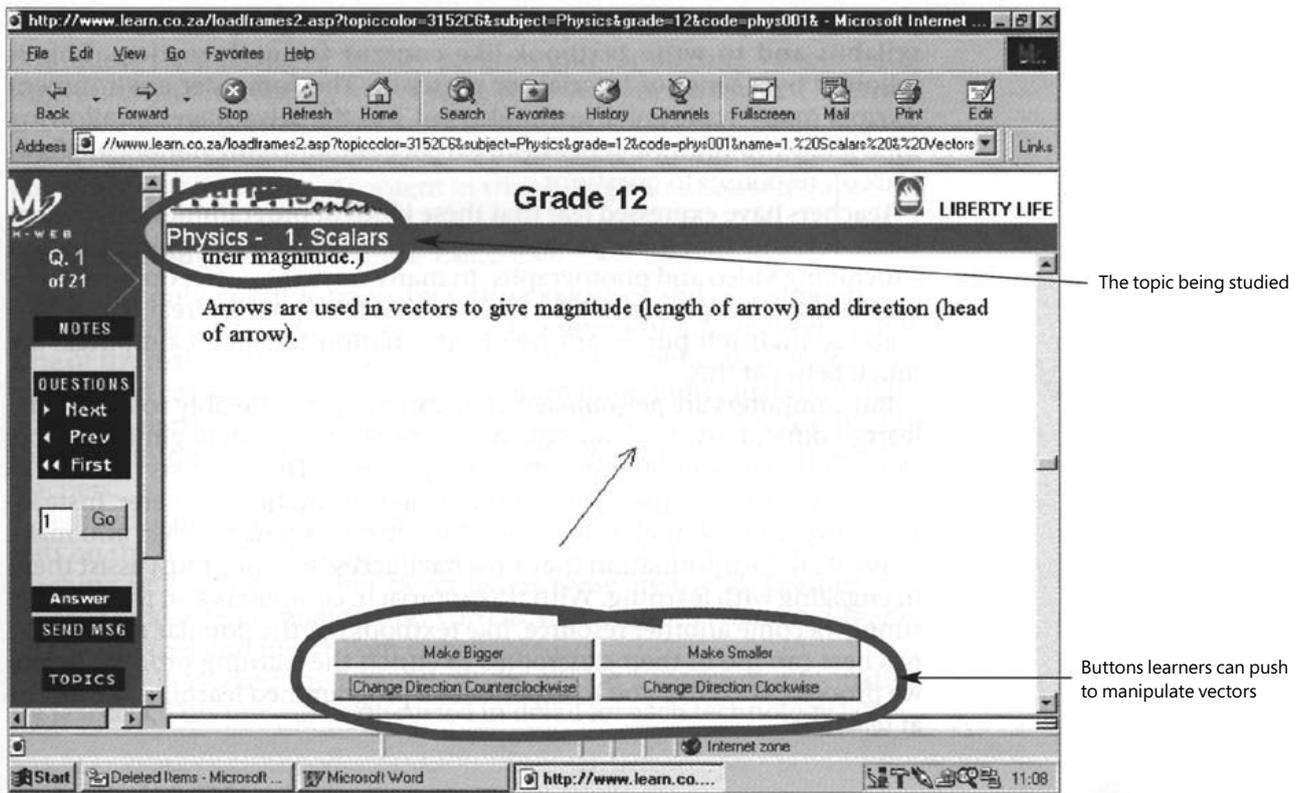
- How would they respond?
- What would stand in the way of them learning?
- What strengths does this kind of teaching have? What are its weaknesses?
- How would you integrate this into your teaching? In other words, how would your teaching style change if your learners had access to computer technologies such as these?

The screen captures on the next page are taken from the *learn.co.za* site and the *cyberschool.co.za* site. (You may want to surf the Internet to find these!) Notice how learners can:

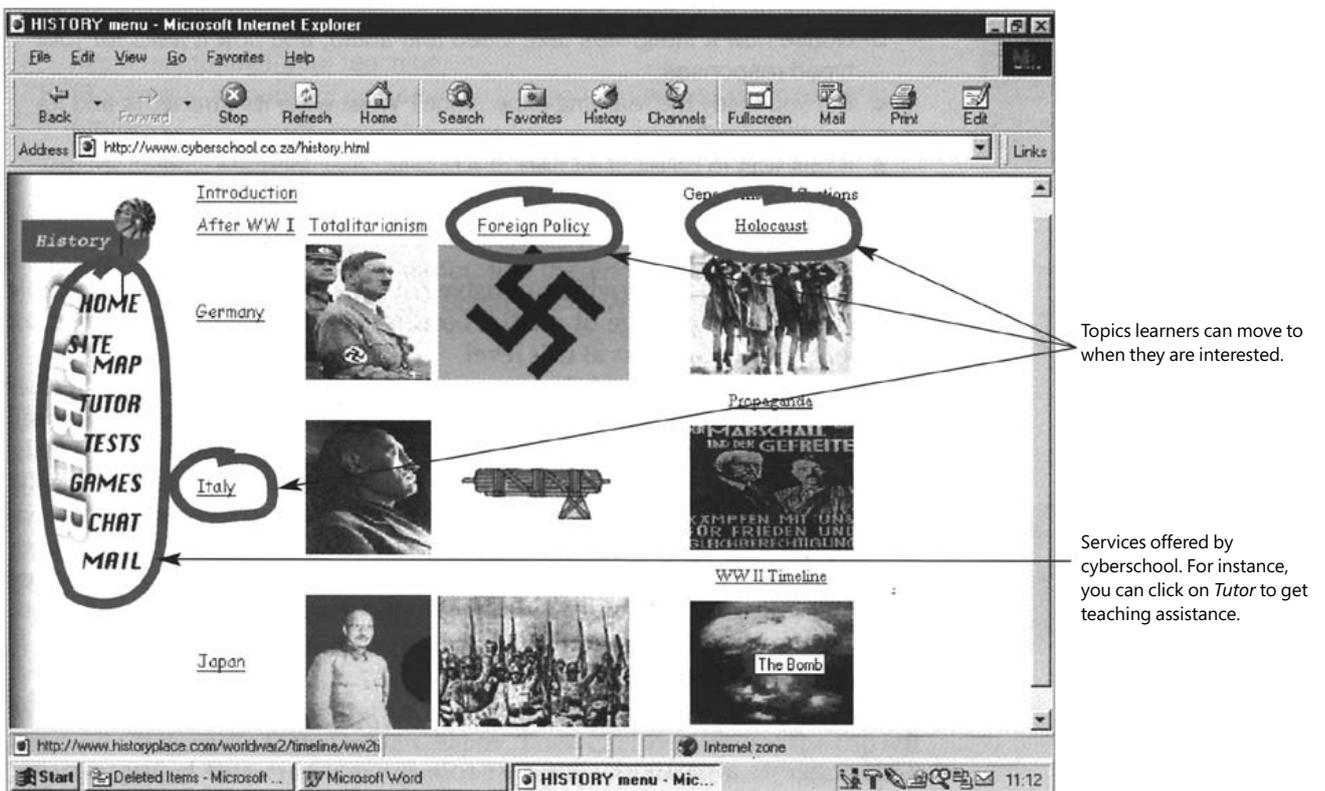
- interact with the screen (the vectors example);
- move through a textbook in whatever order they want (the history example).



Re-read the list of software packages you compiled during your visit to the computer store. How many of these could be classified as *teaching programmes* rather than '*content-tree*' applications?



For instance, learners can read through Physics notes on 'vectors and scalars' in this *Learning Online* programme. They can click on the navigation buttons to see the arrow change direction.



History learners, likewise, can click on the hyperlinks on this page to find more information about Italy or Japan in the Second World War.

Often these types of computer programmes are designed to break down the syllabus and to write textbook-like content for each section. This is followed by a series of tutorials or exercises. The computer environment mirrors many traditional textbooks, but has the advantages of allowing each learner to proceed at his/her own pace and of giving immediate feed-back on responses to questions.

Teachers have expressed fear that these kinds of programmes will replace them. It is true that these programmes carry huge amounts of information – including video and photographs. In many ways they offer opportunities that teachers simply cannot. So it is true that they pose a threat to teachers who see their job purely as one of information transfer. Computers are much better at this.

But computers are *programmed*: they can't respond flexibly to individual learner difficulties. As a consequence, many learners can begin to feel lost in the huge amount of information they receive. This suggests that teachers do have a role to play, but not simply as information deliverer. Instead, they must increase their skills in teaching learners how to select and make sense of all the information they now have access to. They must assist them in engaging with learning. With this approach, computers and the Internet simply become another resource, like textbooks or the popular media, that teachers can use in their classrooms to enrich the learning process. Before we proceed, we'd like you to experience a programmed learning site aimed at teachers.

ACTIVITY 57

***NOTE:** The references in this activity are out of date and the CD-Rom is not available. But the activity has been kept as an example.

Turn to your CD-Rom, click on *Educational Resources* and then on 'Shoma'. This will take you into a teacher development programme. Work on this for about an hour (or longer).

- a** Notice how it is programmed. In other words, you must do activities and get them right before you move on.
- b** Notice how it integrates text, video and audio, and how it asks for your typed responses.
- c** Did you enjoy the learning experience? What were its strengths and its weaknesses?
- d** If this was to be used as part of a teacher development workshop, how would the workshop facilitator's (or college lecturer's) role have to change?

The programme does provide a massive amount of information, and is able to do so through a range of media. Lecturers and teachers simply cannot compete with computers at this level.

But you may have found that you wanted to ask questions relating either to content or to the technical process. Computers cannot provide this kind of assistance as well as teachers can. Learners still need guidance and assistance. While learners often find using computer programmes fun, especially where regular drill and practice of procedures are needed to meet the intended outcomes of a particular learning area, there is still a need to talk about their learning. Likewise, learners enjoy programmes of this sort because they let them know immediately whether their answer is correct or not. But, again, this response is programmed and, because of this, it is either:

- not particularly in-depth; or
- not geared to your particular needs.

This suggests a particular kind of role for teachers and lecturers using computer technologies.

'Programmed' learning packages have been criticised as unimaginative and educationally restrictive. Nevertheless, such programmes can be very useful for certain outcomes. Powerful developments in these programmes now allow for tracking of learner progress and for offering various pathways and dynamic testing routes to be followed. For instance, if a learner answers a set of questions in a certain way, the learner is directed to additional content. These programmes are better suited to learning areas with hierarchical and structured content in which single solutions are expected.



You should begin Week 20 now.
You will have spent at least 114
hours on this module so far.

Computers as learners

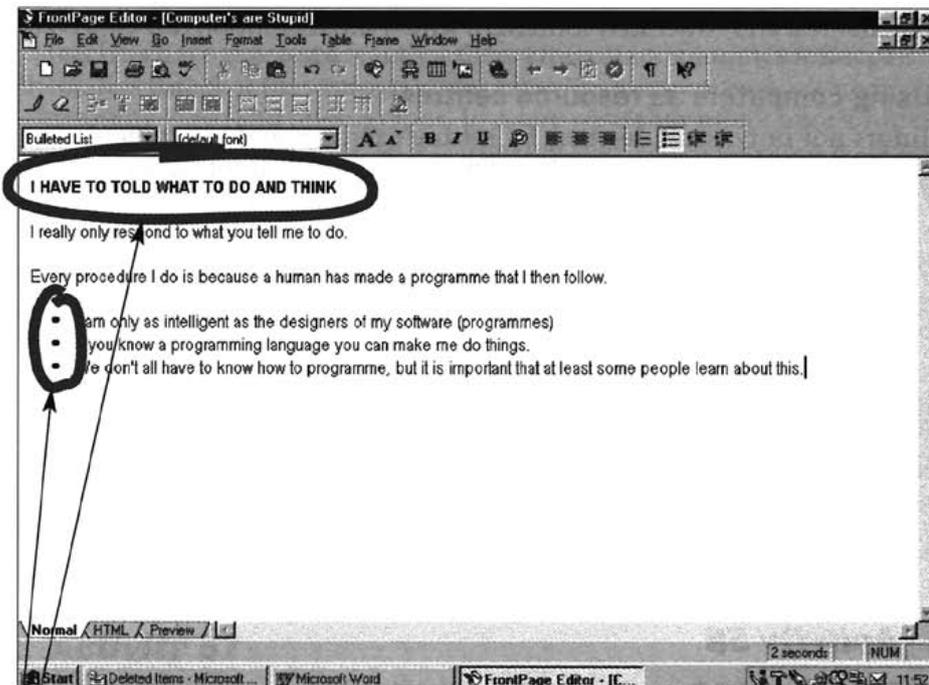
As we said earlier, computers can't think. Computers follow the instructions that other human beings – computer programmers – programme into them. In other words, computers are 'taught' by human beings, and so can be thought of as 'learners'.

In order to 'teach' (programme) computers, you need to learn a language that computers understand. One such language is HTML, which stands for *Hypertext Mark-Up Language*. This is the language used to design sites on the World Wide Web (or the Internet), and on your CD-Rom. Do you want to see this? Click on *Go to the Online Chapter*. Then click on *View* (at the top left of your screen). A drop-down menu will appear. At the bottom of this you will see *Source*. Click on this. A very untidy page will appear. These are the instructions given to the computer by the designer to make the computer produce the kinds of pages you see on this CD-Rom.

Have a look at the 'screen captures' on the next page. They demonstrate a similar point about how computers are taught to do things.

This is the page you would see on the Internet.

But the design of the page – for instance, the bold capitals used for the heading – only appear because the programmer has instructed the computer to do this.

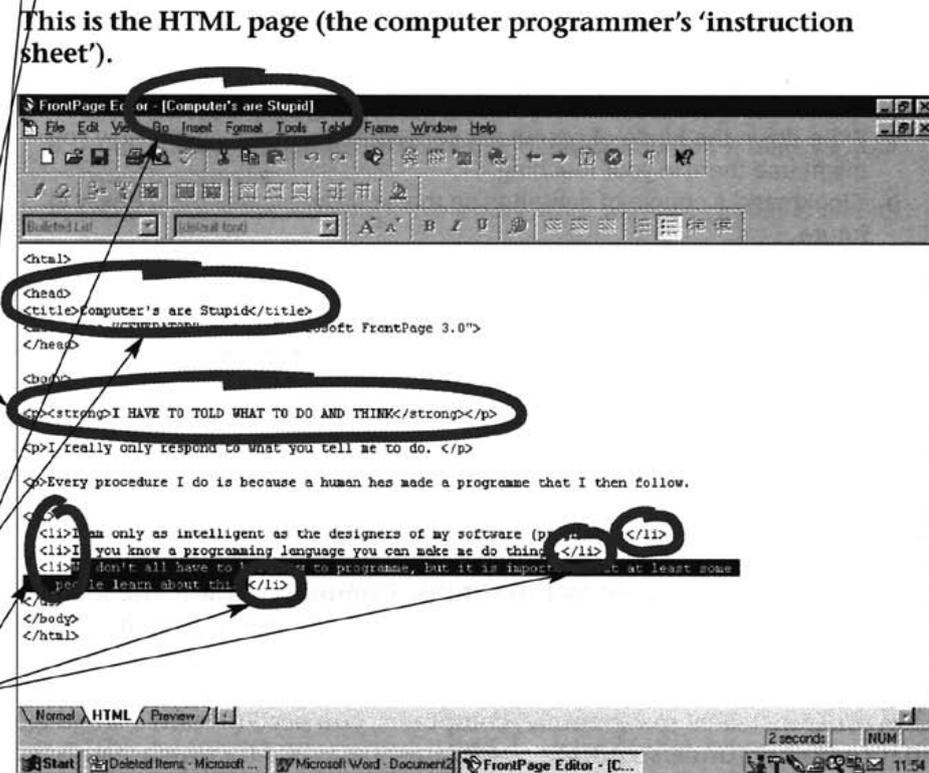


You will notice, for instance, that the instructions for the bold capital style heading appear as ``. Then, at the end, another instruction appears cancelling the earlier instruction, `</p>`. If this cancellation did not appear, the entire document would appear in bold capitals!

This is a very simple page. HTML is a language that allows you to design pages that are far more complex and can include photographs, graphics and even music. But, in all cases, it only works on the basis of instructions from a computer programmer. It can only do what it is 'taught' to do.

The programmer wrote `<head><title>` in order for the computer to understand that 'Computers are stupid' had to appear in the title line at the top of the computer page.

The instructions on the HTML page – `` and `` – are the reason why the Internet page has bullet points on it.



This is the HTML page (the computer programmer's 'instruction sheet').

When computers were first introduced to schools in Europe and the United States, their most common use was to teach learners programming skills. Learners were taught how to programme computers and learnt various computer languages (such as *Cobol*, *Basic* or *Logo*). They were expected to write simple computer programmes.

Today very few schools offer computer programming courses. Instead, computer programming is regarded as a specialized skill that can be taught in senior and further education phases to those who choose computer studies as a subject or learning area.

However, schools do sometimes teach simple programming languages in order to develop skills such as logical thinking or problem-solving, rather than computer programming. *Logo* is one language that is used quite often for this purpose. It is a simple command-based language that is popular with young children. The language consists of simple commands that are given to a turtle (the cursor) to move in various directions. As the turtle moves, it leaves a trail behind it, thereby enabling users to draw pictures by writing simple programmes.

Conclusion

Computers can be used in a number of ways by teachers. **First**, they can assist with many administrative tasks such as typing, record keeping, book-keeping, and so on. This enables teachers to spend more time on educational functions rather than time-consuming administrative matters. Computer applications – such as word-processing, spreadsheets and graphics software – have been designed to help with these tasks. While many operate in very similar ways, such as WordPerfect and MS Word, different companies have made different brands of these applications.

Second, computers can be used as a source of information or curriculum content. These can be of two kinds. Some programmes are structured to guide learners through their learning. Learners can go at their own pace through the work and get immediate feedback from questions. However, too many of these programmes work only when the learning to be achieved is 'information-thick' and has predefined answers. Learning that requires critical discussion still needs teachers.

Third, computers can only do what we tell them to do: they must be programmed to do any task. This is a growing field of employment, and South Africa needs many more people who are able to programme educational programmes or administrative tools. Some schools provide learners with the opportunity to learn simple programming languages, but often this only becomes a choice later in schooling, or at universities or technikons.

What can teachers do in this new computer world? Probably the first step they need to take is to become computer literate.

Developing computer literacy

7.3

Computers only make work more efficient if you know how to use them and can easily find one to use. Where this is impossible, it may well be better for teachers to focus on improving their manual procedures and systems. For instance, if there is only one computer in a school and it is used mainly by administrative staff, and made available for limited periods in the afternoon for teachers, then it might be difficult to make all your work electronic.

But computers are relatively cheap and becoming increasingly so. Most teachers do not require a high-powered expensive computer all the time. Typing out and storing worksheets, or keeping a record of marks, for instance, requires a relatively simple and cheap computer. Even where schools do not have computers, we believe the first step to computer literacy for a teacher should be beginning to use a computer in his or her professional life. It is very unlikely that you would feel comfortable introducing computer use into your classroom teaching if you have not used a computer regularly yourself.

Teachers at the Bellingham School District in the United States of America have compiled a useful self-assessment matrix for computer competence. Let's use this matrix to assess your computer competence.

What is your current level of computer competence?

ACTIVITY 59

- a** Judge your level of achievement in each of the following competencies. Circle the number which best reflects your current level of skill attainment. (Be honest, but be kind.) This tool is designed to help understand your current level of skills with computer technologies and to plan for professional development.
- b** How would you go about improving your computer literacy? Discuss this with fellow teachers.



You should be in Week 20 now; you will have done at least 115 hours of work on this module.



Spend about an hour doing this activity. Discuss your results with fellow teachers.

USING COMPUTERS AS A BASIC ADMINISTRATIVE TOOL

→ Basic Computer Operation

- 1: I do not use a computer.
- 2: I use the computer to run a few specific, pre-loaded programmes.
- 3: I run two programmes simultaneously, and have several windows open at the same time.
- 4: I troubleshoot successfully when basic problems with my computer or printer occur. I learn new programmes on my own. I teach other basic operations to my students.

→ File Management

- 1: I do not save any documents I create using the computer.
- 2: I select, open and save documents on different drives.
- 3: I create my own folders to keep my files organized and understand the importance of a back-up system.
- 4: I move files between folders and drives, and I maintain my network storage size within acceptable limits. I teach students how to save and organize their files.

→ Word Processing

- 1: I do not use a word-processing programme.

- 2: I occasionally use a word-processing programme for simple documents. I generally find it easier to handwrite most written work I do.
- 3: I use a word-processing programme for nearly all my written professional work: memos, tests, worksheets, and home communication. I edit, spell-check, and change the format of a document.
- 4: I teach students to use word-processing programmes for their written communication.

USING THE COMPUTER FOR SLIGHTLY MORE ADVANCED ADMINISTRATIVE USE

→ Spreadsheet Use

- 1: I do not use a spreadsheet.
- 2: I understand the use of a spreadsheet and can navigate within one. I create simple spreadsheets and charts.
- 3: I use spreadsheets for a variety of record-keeping tasks. I use labels, formulas, cell references and formatting tools in my spreadsheets. I choose charts that best represent my data.
- 4: I teach students to use spreadsheets to improve their own data-keeping and analysis skills.

→ Database Use

- 1: I do not use a database.
- 2: I understand the use of a database and locate information from a pre-made database such as Library Search.
- 3: I create my own databases. I define the fields and choose a layout to organize information I have gathered. I use my database to answer questions about my information.
- 4: I teach students to create and use databases to organize and analyse data.

→ Graphics Use

- 1: I do not use graphics in my word processing or presentations.
- 2: I open, create, and place simple pictures into documents using drawing programmes or clipart.
- 3: I edit and create graphics, placing them into documents in order to help clarify or amplify my message.
- 4: I promote student interpretation and display of visual data using a variety of tools and programmes.

→ Presentation Skills

- 1: I do not use computer presentation programmes.
- 2: I present my information to classes or groups in a single application programme such as a word processor, a spreadsheet, or a publishing programme.
- 3: I present my information and teach my class using presentation programmes such as Powerpoint or SuperLink, incorporating various multimedia elements such as sound, video clips, and graphics.
- 4: I teach my students how to use presentation software. I facilitate my students' use of a variety of applications to persuasively present their research concerning a problem or area of focus in their learning.

USING COMPUTERS AS RESOURCE AND COMMUNICATIONS TECHNOLOGY

→ Internet Use

- 1: I do not use the Internet.

- 2: I access school and district websites to find information. I follow links from these sites to various Internet resources.
- 3: I use lists of Internet resources and make profitable use of Web search engines to explore educational resources.
- 4: I contribute to my school or district websites. I teach students how to use the resources available on the Internet effectively.

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→ **Telecommunications Use (E-mail)**

- 1: I have an e-mail account but I rarely use it.
- 2: I send messages using e-mail – mostly to district colleagues, friends, and family. I check my e-mail account on a regular basis and maintain my mail folders in an organized manner.
- 3: I incorporate e-mail use into classroom activities. I use e-mail to access information from outside sources.
- 4: I involve my students in using e-mail to communicate with other students and various kinds of experts from other countries.

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→ **Information Searching**

- 1: I am unlikely to seek information when it is in electronic formats.
- 2: I conduct simple searches with the electronic encyclopaedia and library software for major topics.
- 3: I have learned how to use a variety of search strategies on several information programmes, including the use of Boolean (and, or, not) searches to help target the search.
- 4: I have incorporated logical search strategies into my work with students, showing them the power of such searches with various electronic sources to locate information that relates to their questions.

MORE ADVANCED USES AND UNDERSTANDINGS OF COMPUTER USE

→ **Ethical Use Understanding**

- 1: I am not aware of any ethical issues surrounding computer use.
- 2: I know that some copyright restrictions apply to computer software.
- 3: I understand school rules concerning student and adult use of e-mail and the Internet. I know the programmes for which my school holds a site license. I understand the school policy on the use of copyrighted materials.
- 4: I model ethical usage of all software and let my students know my personal stand on this issue.

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→ **Video Production**

- 1: I do not use a video camera.
- 2: I create original video tapes for home or school projects.
- 3: I create original video tapes using editing equipment.
- 4: I use computer programmes to edit video tape presentations and I teach my students to create and edit video tapes.

.....

→ **Technology Integration**

- 1: I do not blend the use of computer-based technologies into my classroom learning activities.
- 2: I understand the Department of Education's technology plan supports integration of technology into classroom activities, but I am still learning about what strategies will work and how to do it. I accept student work produced electronically, but do not require it.
- 3: From time to time, I encourage my students to employ computer-based technologies to support communicating, data analysis and problem-solving.
- 4: I frequently model and teach my students to employ computer-based technologies for communication, data analysis, and problem-solving.

Developing your computer competence

If most of your responses were level 1, you probably do not have access to a computer and therefore have a low level of computer literacy. Obviously, if the majority of your responses are 3s or 4s, it is likely that your level of computer competence is good. It is likely that many teachers will demonstrate a higher level of competence in the first two categories.

You obviously need to find ways to get to use a computer in order to develop your computer skills. The above self-assessment form gives you an idea of how computer competent you are, and shows where you need to start to focus for your development. In order to develop your own computer competence, you may want to consider taking some of these actions:

- *Consider buying your own computer for use at home.* Some schools have decided to negotiate package deals with computer suppliers, which reduce the costs of personal purchases by staff when these are made by a number of staff or when the school is buying a number of computers. Others have negotiated computer loans for staff that can be paid off over several months. You may want to explore similar options with colleagues and your principal.
- *Try to ensure that a computer is available at school for teaching staff use.* Such a computer may be placed in a staffroom, library or staff work space. You should use a booking procedure to avoid unnecessary disputes. You may want to use the argument to convince senior staff and governing bodies that, unless teachers have meaningful access to computers for their use, learners are unlikely to get the necessary exposure to computers as they will not be integrated into classroom teaching.
- *In the absence of a computer being available for your use, try to make the best administrative use of computers in the school.* For example, where a secretary is available to type out tests, worksheets or correspondence, ensure that you collect an electronic copy of these (on a disk) for future reference and amendments - to avoid having to duplicate work the next time these are needed.
- *If you have a computer available for your use, consider going on courses designed for teaching specific applications to develop your competence.* These courses are widely available commercially, or through NGOs or teacher centres, and could form part of your professional development.

But you should be careful about who you register with to do your course. Because computer training is in such demand at the moment, there are many 'fly-by-night' computer schools in operation.

Be careful about where you study

Before you register for a course, ask potential providers the following questions:

- *Are the software programmes you teach the programmes I want to use or have access to?* (There is no point studying a word-processing programme that you have no access to!)
- *How many computers do you have? Will I have access to my own computer most of the time?* (Computer literacy requires hands-on training. Good institutions will ensure that most of your time is spent at a computer.)
- *Who teaches your courses? Are they qualified professionals? Or do you rely on a computer-based programme to do the teaching?* (Some institutions rely entirely on packaged online courses. While many of these are good, you should check that the staff running these courses have enough expertise to offer good support.)
- *What kind of support do you offer?* If it's a lecture-based course, do you offer supporting notes? Are staff available after hours for queries? (Ideally, courses should offer both good course materials – so you can learn on your own – and



ORT LEAP trust offers teacher training in the subject area of technology. These courses include modules on Information Technology. Professor Cronje at the University of Pretoria coordinates a Masters in Education programme on using computers in Education. His courses and students' work are available on the Internet at <http://hagar.up.ac.za/catts/abc/home.html>. You may want to browse through them out of interest or to consider enrolling for the programme for your later professional development.

Alternatively, contact School Net (www.schoolnet.org.za) or Netdays SA (www.netdays.co.za). These are both South African organizations committed to improving school access to computer technologies.

access to a help-line or staff member so that you can get assistance when you get stuck. This support should be offered for a period after the face-to-face training has ended.)

- *Does the course offer some form of accreditation?* (This is not vital, but useful. However, beware of 'attendance certificates' – they mean nothing. If you want accreditation, go for a course that has some reliable form of assessment.)

Without being able to practise and use what is taught in such courses, they are generally recognized to be ineffective. For example, a one-week course on using a word processor is likely to be of little value unless you are able to start to use a word processor on a regular basis to support your daily work.

Developing your learners' computer competence

There is currently a strong push to ensure that learners are computer literate and able to use basic computer applications. Computer literacy is fast becoming a core competence for many work and learning environments. In fact, Curriculum 2005 lists it among the critical cross-field outcomes (CCFOs), as well as among specific outcomes in learning areas such as Technology, and Language and Communications. As teachers in schools, how can we contribute to realizing this outcome?

Obviously you could begin by measuring the computer literacy of your learners by using the Bellingham form or, preferably, an adaptation of this form. Then you could do the following:

Establish special computer literacy classes

One way to develop computer skills is to timetable special computer literacy classes. Each class spends a certain amount of time in a computer room or laboratory 'learning computers'. Like the above-mentioned courses on computer applications, this is likely to have little impact on learners unless use of these applications is integrated into their daily routine through other learning areas. In other words, as a CCFO, all teachers should:

- integrate computer use into (at least some) of their lessons;
- provide assignments that encourage computer use;
- assist learners to get access to computers (at school, at home, or through local community centres).

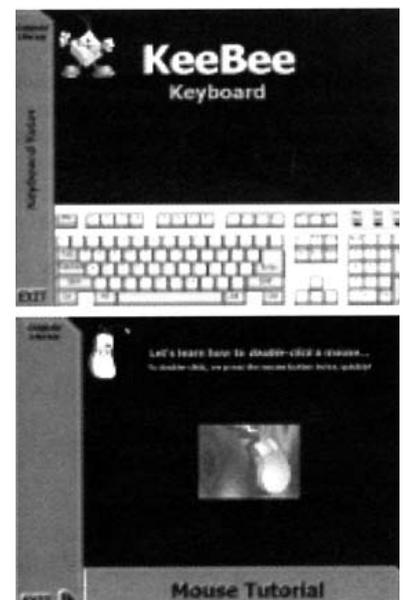
There are also many commercially available programmes that teachers can use to teach computer literacy. These KeeBee and Mouse Tutorial screens are taken from a 'Computer Literacy' computer-based training course that is locally produced and designed specifically for the South African market.

Beginners, intermediate and advanced levels take learners through various levels of basic computer competence, from using a mouse and the keyboard to topics such as viruses and Basic Input Output Systems (BIOS). They include graphics, video and audio, and users can proceed at their own pace as they learn about computers.

Multimedia Scapes is a South African distributor of educational software, and has some interesting products, though most have been designed for the corporate and higher education markets. LearnKey and DiscoveryWare products focus on teaching how to use basic computer applications such as Word and Excel. Visit www.mmscapes.co.za to see their range.

Developing computer literacy through learning area lessons

Instead of having a separate subject for 'learning computers', we should also introduce computer use into all our lessons. In this way, we can extend what is done in special classes - but we can also encourage learners to see computers as a tool for assisting with their normal school tasks. How we do this depends on the age of our



learners, the number and availability of computers in the school, and the subject area, but here are some examples of integrating computer use into lessons.

Get learners to word process normal assignments

Here is straightforward addition to a written task that can be done at almost any age and for any subject area:

For your assignment on birds, I expect at least two typed pages using the sub-headings we have discussed. Your presentation is important, and will form 5% of the assessment of the task.

It does, however, require extra attention from the teacher. Before doing this, ask yourself:

- How can I make sure my learners can easily get access to a computer? (Arrange with a computer support teacher, book the computer room for a specific number of lessons, make sure the computers are available after hours and, if necessary, book them for your learners.)
- Can my learners use a word processor? What type of support do they need?
- Why am I making this requirement? What computer competence outcomes are expected? How will these be assessed, if at all?

Get learners to use programmes for time-consuming mathematical tasks

Here is an example where a mathematics teacher uses the computer as a tool to help learners draw graphs quickly:

In this activity we are going to use Graph-It to draw the five equations I have written on the board. I know all of you can draw graphs, but I want us to use the computer today to see what happens to the graph when we change the equation.

Start by entering $y = x^2$, then $y = 2x^2$, $y = 3x^2$, and so on. When you have the five graphs on your screen, make up your own similar equation to draw. Then press 'printscreen' to get a printout of these graphs, and label each graph with its equation.

The mathematics teacher is not wanting to see if the class can draw graphs, but rather whether they can notice patterns. Using a computer enables students to see the effect of changing a number in the equation very quickly. You may want to turn to your CD-Rom and to look again at the multimedia education group's programmed educational resource on numeracy. (*Click on Educational Resources.*)

Getting learners to use word processing in a 'process' writing exercise

This English teacher uses the fact that making changes on a computer is quick and easy to help her class develop writing skills:

Today we are carrying on with our creative writing exercise. Please take out your disks and hard copy with the first draft of your essay. Give the hard copy to me and give your disk to your partner. I would like each of you to edit your partner's work carefully. You can make appropriate comments. Please make sure you save the changed version with a new file name so we still have a digital copy of the first draft.

hard copy: a printed-out version (on paper) of a computer document (so called because the digital version electronically saved in the computer or on a disk would be a 'soft' version)

Instead of having to re-write their essays, the learners can make changes and corrections using a word processor. The teacher also introduces peer review and teamwork to get a better piece of writing.

How any computer application is integrated into a lesson depends entirely on you as the teacher, and on the learning outcomes of the lesson. Many teachers design worksheets to guide learners through activities using a computer. This lets learners work at their own pace through the tasks, and means that you can help individuals without holding up the entire class.

Like all lessons, lessons using computers need to be carefully planned to be successful.

ACTIVITY 60

- a Can you think of any other ways in which computer work can be integrated into day-to-day schoolwork? Are there any other tedious or time-consuming tasks (such as drawing graphs) that your learners are required to do where a computer can be used to speed them up?
- b What constraints do you see in your particular situation? How could you begin overcoming them?



Spend about 20 minutes on this activity. Don't ignore the activity if you have no computers at your school. Think, instead, of how you could work round this problem. For instance, do learners have access to computers at home, or through an Internet cafe or local business?

7.4

Using computer technologies in teaching



You are in Week 20; you will probably have done at least 118 hours of work on this module so far.

Using CD-Roms

CD-Roms (Compact Disk-Read Only Memory) are similar to commercial audio CD-disks (music CDs) but can store audio (sound), video, text (typed words) and graphics (pictures). This mix of media in a single technology is referred to as 'multimedia'.

Multimedia resources can either be distributed or accessed using CD- Roms or the World Wide Web (WWW). The text that appears on your computer screen when you open a site on the WWW, or open a CD-Rom programme, will look much like what you are used to finding in books. But it has at least one important difference: the existence of what are called 'hyperlinks'. You may notice that some words in the text appear in a different colour, or are underlined. This generally indicates that they are *hyper-links* – which indicate that you can move directly from this word to linked ideas elsewhere on the CD-Rom, or anywhere on the WWW.

Hyperlinks have made navigation through multimedia materials much easier since, with the click of a mouse button, a user can bring up different screens, play a video or audio clip, or switch to a standard computer application.

As CD-Roms store and play back huge amounts of data, they are commonly used for storing any type of computer files (for example, for archiving files), as an alternative way of publishing books, for storing and distributing computer software, games and educational materials. The data can either be plain text (such as a dictionary or thesaurus, or word document) or include pictures, photographs, audio or video clips (such as a multimedia encyclopaedia).

CD-Roms as a reference or source of information

CD-Roms are often used as reference sources and therefore have been introduced into a number of libraries and resource centres. CD-Rom encyclopaedias best illustrate this type of use.

There are many CD-Roms available for this type of reference material. Some focus on a range of topics (such as an encyclopaedia), while others focus on a specific topic (such as World War II, musical instruments, endangered animals, the human body). Most of these types of CD-Roms are not made in South Africa and are usually produced in the United States of America or the United Kingdom.



'Talking books' or interactive stories

Another common use of CD-Roms, particularly in primary schools, is for 'talking-books'. These are used for teaching and encouraging reading, and have the potential to:

- develop reading skills by giving children an overview of the story before reading it;
- encourage independent reading through the audio clips that sound out words;
- encourage collaborative reading when a small group of children (3-4) work on one computer.

Whether these potentials are realized or not depends on the way the teacher interacts with the learners before, during and after the computer session. For learners to benefit fully from CD-Rom talking books, they need to be coaxed and encouraged to talk to one another.

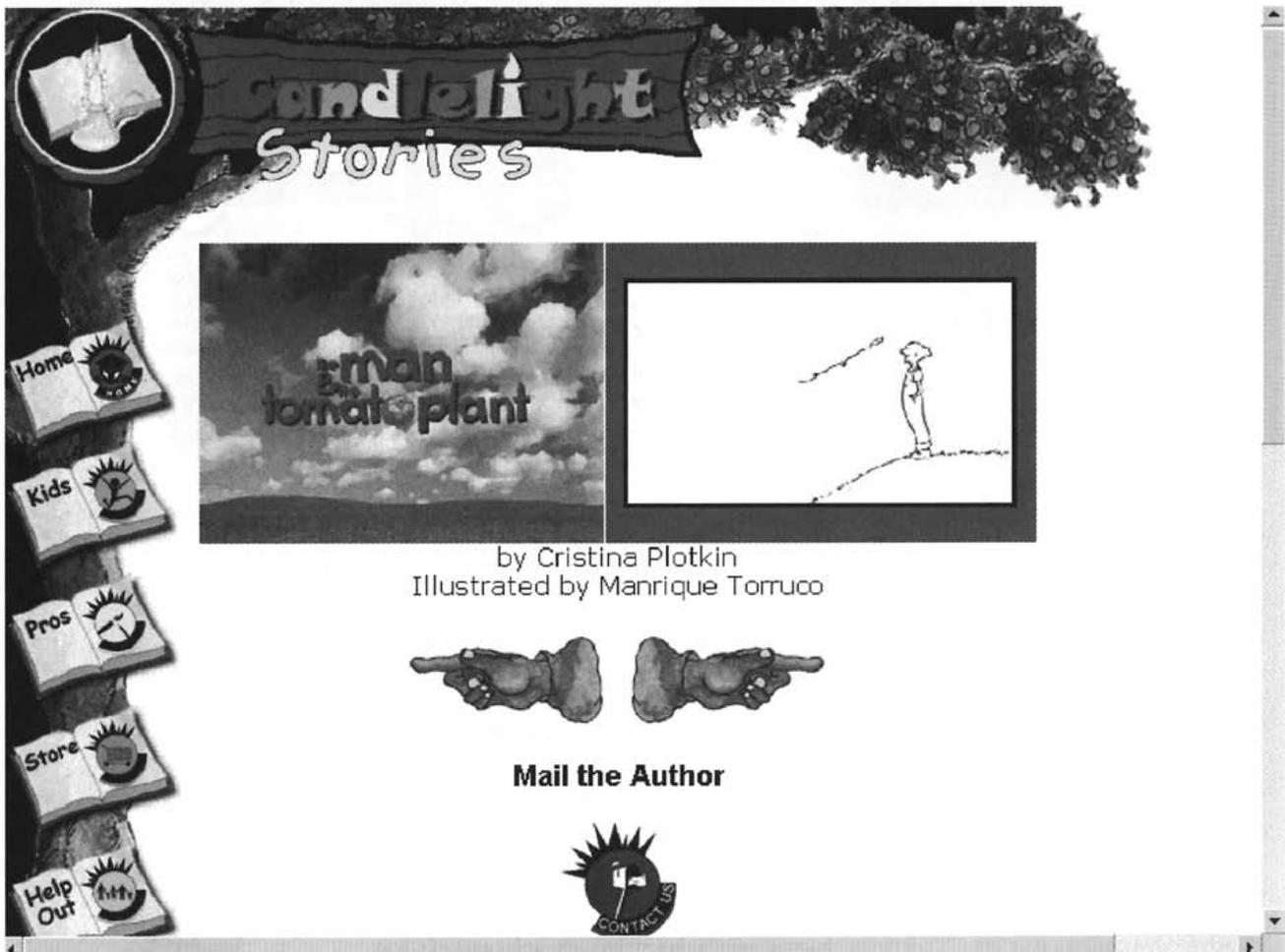
These types of multimedia resources are also available on the Internet. While the Internet offers a much wider range of materials than a CD-Rom does, the best materials or parts of materials can often only be downloaded and used at a cost. Downloading video (especially) and even audio takes time, and requires a high-powered computer. Images can be retrieved and viewed much more quickly on CD-Rom. However, the Internet does offer the ability to communicate – something the CD-Rom doesn't offer. So it is possible to 'converse' with a fellow learner or teacher 'online'. But this also comes at a cost: to remain online means that you are logging up telephone bills. However, the cost of each 'conversation' will be that of a local telephone call.



This information about 'talking books' has been taken from a book called *Teaching and Learning with Multimedia* by Collins, Hammond and Wellington, 1997, London: Routledge. It is worth reading as, although it focuses on British schools, it has many examples of the ways that multimedia resources have been used in primary and secondary schools, and interesting commentary on both successes and failures.

At Rivonia Primary School in Johannesburg, 'talking books' or 'interactive stories' are used with most junior classes. The CD-Roms are used when the whole class comes into the computer room, or by individual learners after school. Living Books, Dr Seuss, Fisher Price and the Darling Kindersley range of topic-focused CD-Roms are used most often.

This screen shows a typical illustrated children's story taken from *Candle-light Stories* at: <http://www.candlelightstories.com>.



Children can click on the icons to 'turn the pages' and can listen to the story by playing the audio track. There is little other interaction. Using the Internet with a dial-up connection makes downloading these stories very slow. On a CD-Rom there is little or no waiting. You can access pages from this site on your CD-Rom. Do you want to try this now?

Designing lessons using CD-Roms

Again, the way in which this type of CD-Rom is integrated into lessons depends on the way you set the task. Learners can easily be swamped by the volume of information available to them. They need to be guided in how to use the product, and to navigate through the CD-Rom using search facilities. When using CD-Roms (and the Internet) we often ask:

- How do we discourage or stop learners printing out reams and reams of information?
- How do we know when learners are learning or just casually browsing and looking at irrelevant (or inappropriate) stuff?

These are not really new questions to teachers. We have always been concerned about the mindless copying out of books, or by exactly how much actual 'work' goes on when learners are set loose in a library or resource centre. It is no different with multimedia resources, although perhaps the scale and likelihood of the

problem is different as multimedia resources now have the potential to present much more information in more appealing ways. We need to guide our learners through focused tasks to be able to select appropriate pieces of information and present these in a coherent and sensible manner. This means we have to design tasks that we know will build information management skills.

A task such as 'Use the CD-Rom to find out something about Nelson Mandela and write it down' will test whether a learner can use a CD-Rom and run a search, but it is unlikely to achieve anything else - it is in fact likely to encourage poor information-processing habits. In order to make these types of activities more meaningful, you need to answer several questions:

- Do you – as the teacher – know what type of information is available on the topic you set? In other words, is it possible for your learners to find the information you asked for, given the available resources?
- What do you want learners to do with the information?
- How structured or open-ended will you make your task and questions?
- Will the task be mainly teacher-directed or learner-directed (both have important uses)?
- Is the task aiming to encourage casual browsing or purposeful browsing (both have merits)?

Again, these are not new questions that have been introduced because you are using a new technology. But they are important questions that are often forgotten in the excitement of using a new technology. When using CD-Roms as a reference, you should set structured but open-ended tasks that require using a few sources and some organizing of information. These types of tasks are generally more engaging and meaningful for learners.

How do we select CD-Roms appropriately?

How we select from the range of available products is important. Here are some initial criteria for evaluating CD-Roms:

- *How has information presented on the disk been selected and presented?* Is there a clear bias or prejudice towards the northern hemisphere, race, gender or anything else? How current and accurate is the information? Is the source of information acknowledged?
- *Does the software design encourage interaction?* Is there a search facility? Can users get to information through a range of pathways (through an alphabetical list, an atlas, a timeline, and so on)? Is there a built-in 'notepad' or calculator? Can learners easily switch to use 'content-free' applications'?
- *How are the multimedia data organized?* Are the information categories sensible and easy to use? Is it easy to view a video, read an article and listen to an audio clip about a single topic, or is each medium stored separately?

Using the Internet

The Internet is a global web of computers that are connected to each other. This connection enables computer users to share information and , resources. In simple terms, the Internet has two main parts - the World Wide Web (WWW) and e-mail. No one owns the Internet, and anyone can use it. You can put your own information onto the Internet by making your own website, or you can visit the web sites that other people have created. You can also send and receive e-mail as long as you have an e-mail address. In this section, we look at the ways you can use the WWW and e-mail to support your teaching.

Open questions: 'What was Mandela's childhood like?' is an open question, as there are many ways to respond to it. But 'What is Mandela's clan name?' is a closed question as it has only one answer.

The World Wide Web

The World Wide Web (WWW) allows computer users to view multimedia materials (like those on CD-Roms) through a computer software programme called a 'browser' (such as Netscape Navigator, Internet Explorer or Mosaic). This means that you can visit web sites that have been created by other users, or you can create your own websites. You can use the WWW in a number of ways for your teaching, as the following teachers' reports illustrate.

General news and information

'I use the WWW to get the cricket score and latest news. I also find it useful for printing out topical newspaper articles to discuss in class. I once needed to know the population of India and didn't have up-to-date statistics about the country. I found the most recent census figures on the WWW.' (Geography teacher)

The WWW can be used as a source of information – you could think of it as being like a very big library. As the Geography teacher mentioned above, you may want to use it for finding general information (such as current affairs, sport, the weather, entertainment, travel plans, or for buying things). To do this, you need to know where to look for the type of information you or your learners require. On the WWW there is a wide range of websites that aim to be a one-stop shop for your information needs. These types of sites often focus specifically on current affairs and news, and have lots of links and categories to enable you to find the information you are looking for. Many of them are linked to a 'search engine' (which we will discuss later) and some offer free e-mail services.

This general news information can help you to find up-to-date and relevant information to use in your lessons. As it is easy to print out information from the WWW, you may bring interesting articles and reports into your class. You can also encourage your learners to browse the WWW to find information about topics that interest them. Using the WWW, you will soon realise that there is a huge amount of irrelevant information or 'junk' on it. Remember, however, that what may be junk to you could be useful to someone else (at least one person – the person who created the website – thinks that each website is useful!). Both you and your learners can spend hours browsing the WWW to find relevant content. You need to decide what educational value this has, and how much time you and your learners should be spending on 'mindless' browsing. To save time, it is useful to start collecting the web addresses or URLs (Uniform Resource Locators) for interesting and useful sites.

Educational news and information

'I use the Internet to get information about educational issues, debates and policy. I don't have to wait for the government gazette or newspapers - I access the latest developments directly.' (District officer)

It is possible to find useful educational information on the WWW – you just need to know where to look. There are basically two ways to get such information – start collecting URLs, or use search engines or directories to find relevant sites for you. Here are some starting points for your URL collection of websites about South African education:

- The *Weekly Mail & Guardian* newspaper has a well-established online daily version of its newspaper (<http://www.mg.co.za>). This includes an archive of articles and an online version of The Teacher, as follows:



<http://www.24.com> is a South African 24-hours news service and <http://www.mweb.co.za> offers similar services and links. International examples of similar current affairs and news sites include: <http://www.bbc.co.uk> and <http://www.ccn.com>.

URLs: These are the addresses of websites. You will use these if you want to go directly to a particular site. They will all begin with <http://www>.

The title of the publication

The name of the host site on the WWW

Hyperlinks to linked stories

WHO WE ARE
E-MAIL US
SUBSCRIBE
ADVERTISE

The Teacher
DAILY MAIL & GUARDIAN

M WEB

Schools awash with drugs
Schools are increasingly a haven for drug abuse, with gullible and curious youngsters easy targets for dealers in many narcotic substances.

[*Drugs and drink at the heart of the Cape](#)
[*A world full of difficult choices](#)

Ghost teachers busted
Rooting out phantom teachers has saved KwaZulu-Natal millions of rands, now to be used to train principals, educators and governing bodies in the skills of financial management.

[FULL STORY](#)

New hope for the Eastern Cape

That was then, this is now
On the twenty-third anniversary of the 1976 soweto uprisings, the youth live in a totally different reality - and have very different dreams

[*Twenty years on](#)
[*The youth today can dream](#)
[*The colour of money](#)

MAIN INDEX
LATEST NEWS
FEATURES
EDITORIAL
RESOURCES
CHALKDUST
CHATTERBOX
LETTERS
BACKCHAT

Prizes to be won
Safety in the home ... art and colouring in competition.
[*Enter the Emergency Services art competition!](#)

European history 'unwanted' in African schools

Visit <http://www.teacher.co.za> to see the latest issue of *The Teacher* and an archive of earlier editions.

- The *Sunday Times* Education site at <http://www.suntimes.co.za/edu> is an online version of the Read/Write education supplement that comes with this Sunday newspaper. Both the newspaper and online versions have a regular Internet Connection column with reviews of education websites of interest.
- For information about South Africa (particularly on policy, politics and statistics), the African National Congress (ANC) site www.anc.org.za is regularly updated and very comprehensive.
- The South African Government Communication and Information Services (GCIS) is also a good starting point for government information: <http://www.gcis.gov.za>.

Teaching and learning resources

'I use the WWW to find lesson ideas for specific topics. I visit educational resource link sites and print out suitable lesson plans. I have found lots of children's stories which I have printed out and filed in my classroom library corner.' (Foundation Phase teacher)

The WWW has various archives and databases on lesson ideas, lesson plans and case studies designed for parents and teachers. Most of these allow for searches using the subject area and age or grade of students as criteria. Most of these databases have been created in and for North America or Europe, and have grown through contributions from teachers.

Some websites have been specifically designed for educational content. These take users through carefully designed content, in much the same way as was discussed under *Using the computer as a tutor*. The biggest difficulty here (besides the expense of being online) is that there is very little relevant content for South African learners at this stage. Some tertiary education courses are now being offered online, but there is currently very little available for South African school learners. Increasingly, though, learner sites are being developed. Here are some useful sites:

- **The Learning Channel** at www.learn.co.za has materials based on Science, English, Business Economics and Geography for Grade 12 and some additional materials for Grades 9, 10 and 11.
- **Cyberschool Africa** (www.cyberschool.co.za) has developed online materials for matriculants in mathematics, science and biology.
- **The Mathematics Learning and Teaching Initiative (MALATI)** at www.wcape.school.za/malati is an excellent resource site for mathematics teachers.
- The University of the Western Cape has created an online South African **Grade 10 Biology textbook** at <http://www.botany.uwc.ac.za/scCed/index.htm>. It is text-based and content driven, and has links to other resources on each topic of the Grade 10 Biology syllabus.

Navigating the Internet: using search engines

Search engines or directory websites enable you to enter key words and phrases, and scour the WWW for websites on any topic you wish to explore. They perform roughly the same function as a catalogue cabinet (or computer search programme) in a library.

In a library, though, there is a librarian in charge and only a finite number of resources. So, if what you are looking for is not in the catalogue, you know it's not in the library. No one is in charge of the Internet, and anyone can contribute information. As a result, there is no central catalogue of websites, so finding what we are looking for would be much more difficult without search engines and directories. One of the main difficulties is that information comes from all over the world. It is therefore often helpful to limit your search to websites from a specific place (like South Africa). There are two main ways in which we can search the WWW:

- **Search engines** use computer programmes to wander through the WWW and follow links collecting details from these websites to catalogue and index.
- **Directories** look like search engines and perform the same functions, but finding and cataloguing the web sites is done by human researchers, not through programmes.

Here are a number of South African search engines you can use to search the WWW:

- **Max** (www.ntax.co.za). a newcomer from M-Web, combines a search facility with a web directory. With more than a thousand subsections, Max catalogues more than 10000 South African websites, It has clear descriptions, an easy-to-use navigational structure, and very few dud links. You may want to tryout the sample of *Edumax* on your CD at this point.
- **Ananzi** (www.ananzi.co.za) is the oldest South African search engine. It indexes more than 87 000 Web pages, and offers a free Web-based mail service, chatlines, news and weather updates.

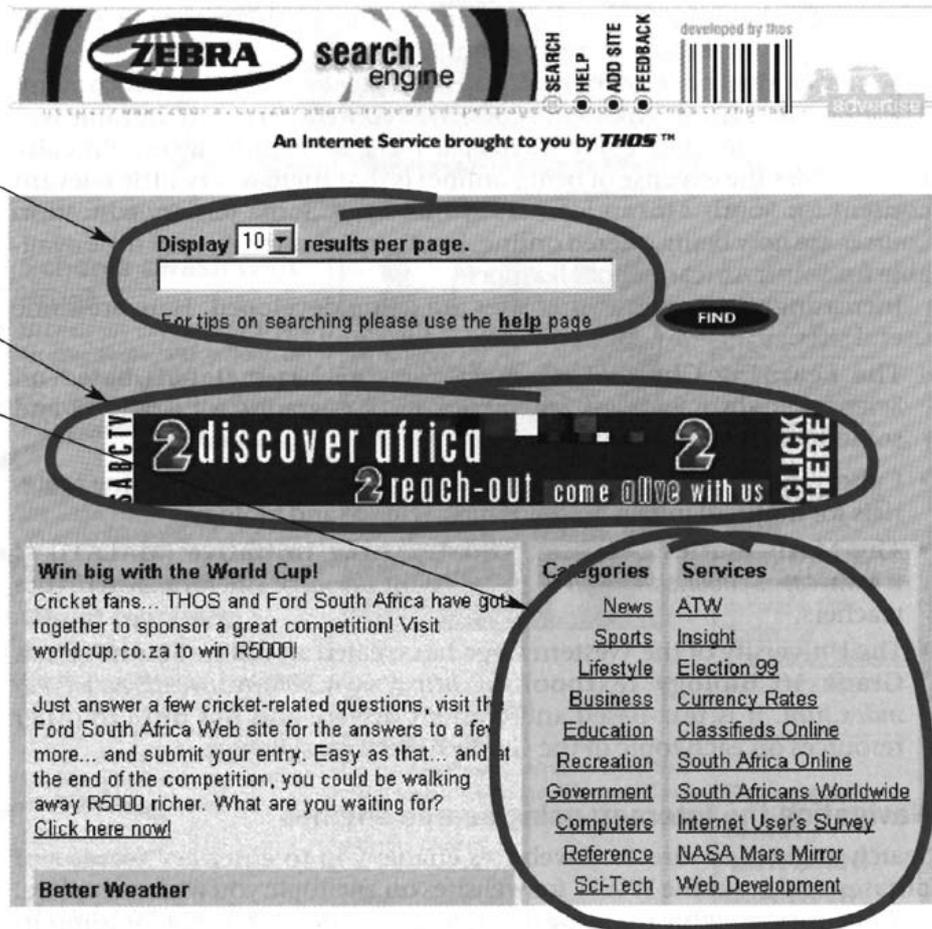


For an overview of South African online content, have a look at <http://www.school.za/overview/tlr.htm>. This was created by Stephen Marquard at Schoolnet SA in November 1998 and shows some interesting examples and categories of online educational content produced in South Africa.

Search line: type the name of the subject you're searching for here, then click Find.

Advertising: Most search engines earn money from advertising

Hyperlinks to linked services



- Aardvark (www.aardvark.co.za) provides percentages for its search results, giving a good idea of how relevant they are.
- Voted best search engine of 1998 by The Sunday Times, Zebra, (www.zebra.co.za) currently indexes more than 100000 pages.
- Gogga (www.gogga.ru.ac.za) indexes articles from the local online media. It searches the major online newspaper publishers.
- Fanagalo (www.fanagalo.co.za) is also dedicated to scouring South African news sites, allowing searches to be narrowed down to the past 24 hours.

One of the best research directories/search engines is www.northernlight.com. This engine keeps a large number of academic articles and good newspaper and journal clippings.

Getting learners to produce their own websites

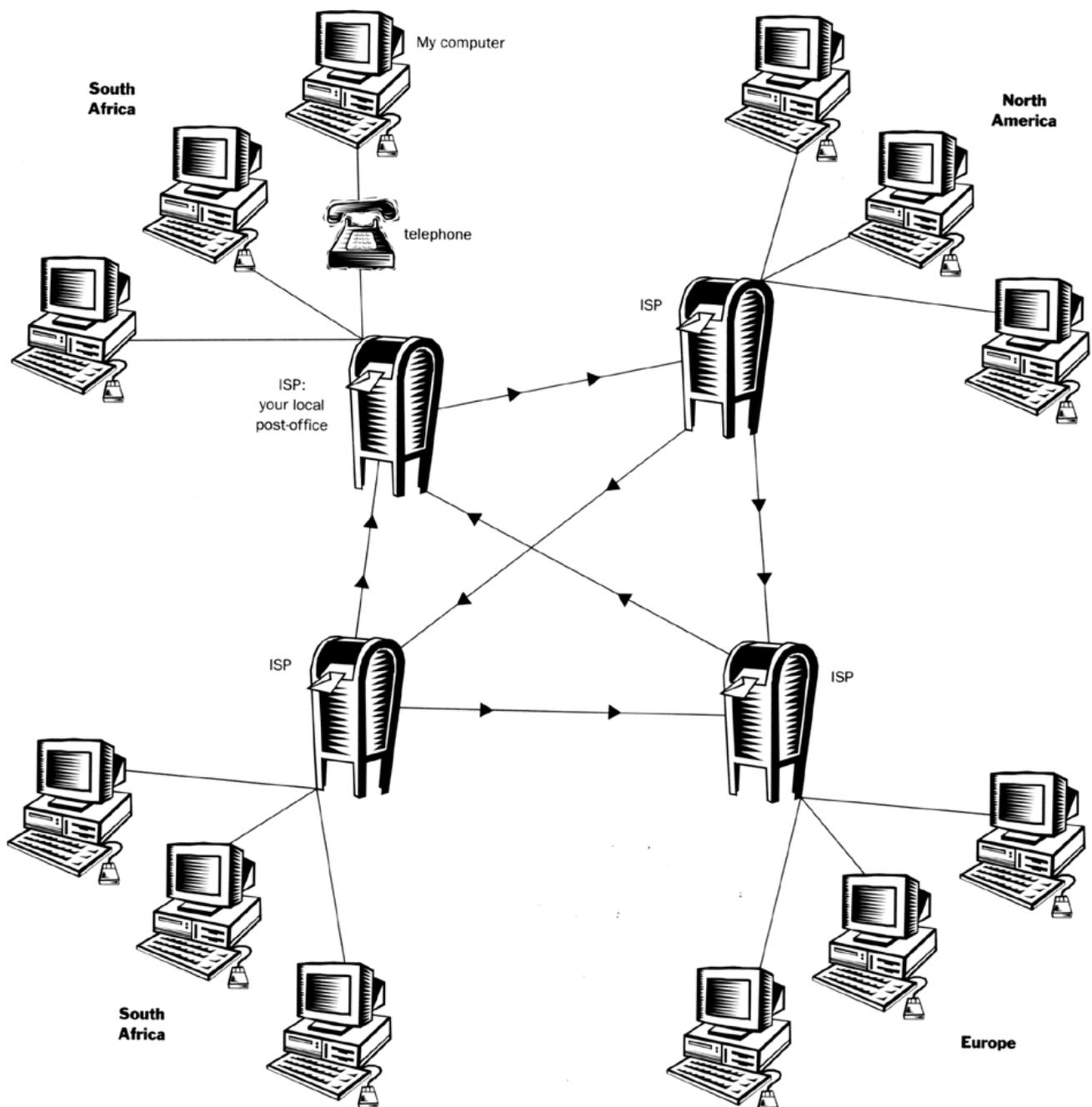
'My afternoon computer club students have all learnt to design websites. They have entered the Think Quest competition, and are really working hard at it.' (Computer Club supervisor)

Both you and your students can design websites. The basics are relatively easy to learn, and there are a number of software programmes that make web design very similar to word processing (for example, FrontPage or HotDog Express). Several Hyper Text Mark-Up Language web sites (HTML-the coding language for web sites) are available online, as are several sites on the latest web developments and developers' tips. If this becomes a personal interest for you, there is certainly sufficient information on the Internet and various short courses on offer to get you started.

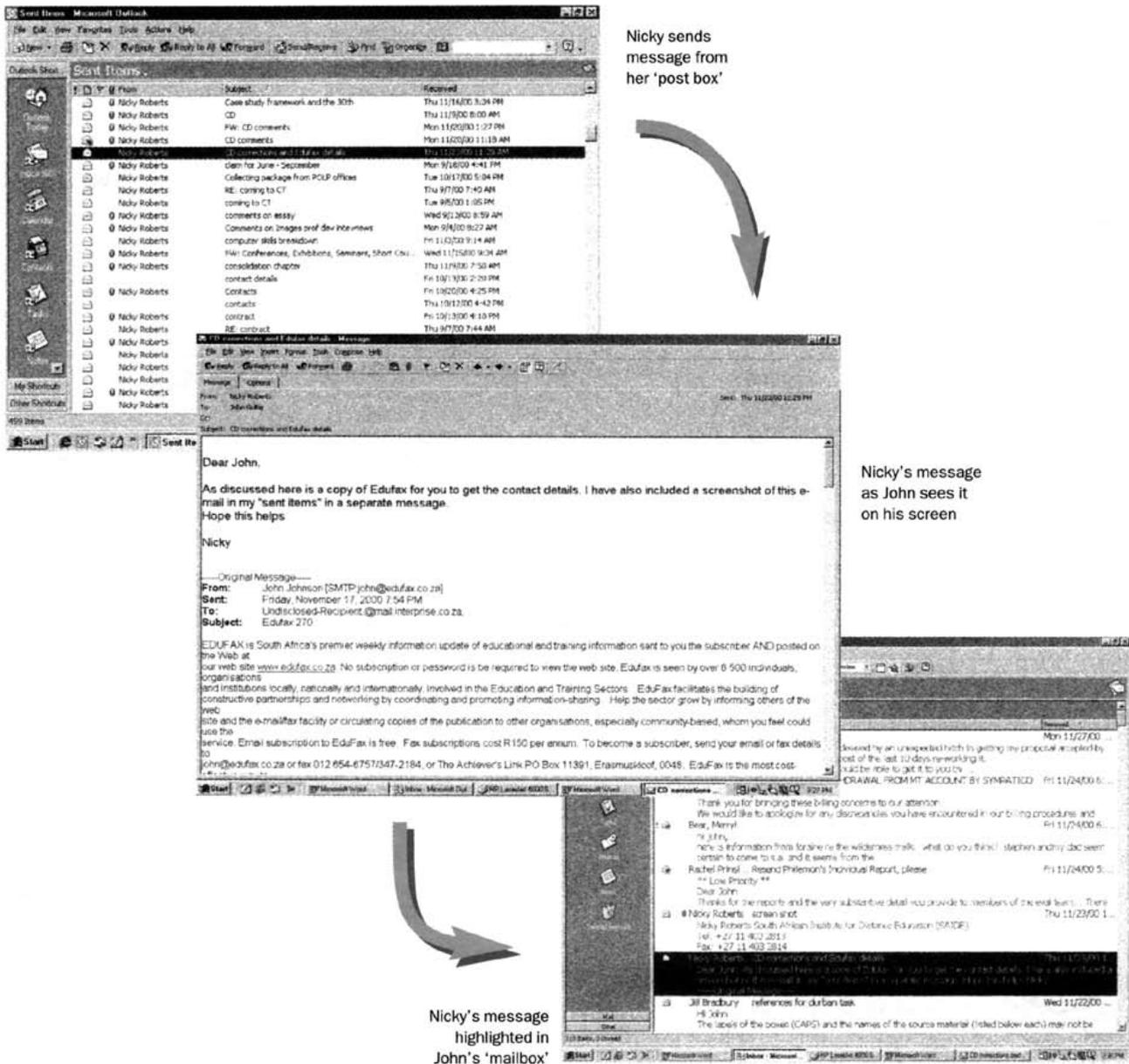
Using e-mail

The other major component of the Internet is e-mail that allows computer users to send messages to each other. Text messages and computer files (such as Word documents) can be sent from one computer to another. It is possible for computer users to have e-mail but not to be connected to the WWW.

This type of arrangement is quite common in schools that use dial-up networking. While each teacher or learner has an e-mail address and can send and receive e-mail from any computer in the Local Area Network (LAN), only one computer is actually connected to the Internet. It is through this computer (the LAN server) that e-mail messages are collected and distributed. E-mail can be used for virtually any correspondence that would probably otherwise have been done using the postal system or facsimile.



The major advantage of e-mail is that messages reach their destination very quickly and cheaply. Sending an e-mail message anywhere in the world takes seconds or minutes rather than days and weeks and costs, at most, the charge of a telephone call to your Internet service provider (ISP). You can also check whether someone has received and/or read your message using a tracking programme. E-mail can be used for all types of administrative communication (such as organizing a sporting event, writing a note to a parent, receiving a district newsletter), as long as the recipient has an e-mail address.



An additional advantage of using e-mail is that you can send the same message to a group of people with very little additional effort. By typing in several addresses, you can set up a *distribution list* that will send the same message to a whole group. This may be useful for sending invitations to a function, for example, or sharing progress on a project. This function also allows you to receive e-mails on topics of interest by subscribing to distribution lists.

If you have e-mail, you may want to subscribe and/or contribute to these South African e-mail information services:

- *Edufax*: A weekly newsletter directed at South African educators. It includes announcements, job offers and training workshops and courses.
- *Telematics for African Development (TAD) Consortium*: A regular information service (sent out about 2-3 times monthly), it deals with the use of technologies for education and development. It includes the latest snippets from the Internet on technology trends, recommended online resources, and news articles and announcements of new products and events.

You can also subscribe to discussion groups where every message sent by any of the group members is received by the whole group. This means that the content is not monitored and, depending on the group, you may be inundated by many irrelevant messages.

Learners can use e-mail to communicate with people outside of their school and community. Collaborative Internet projects can be established between groups of learners in very different contexts. The learning process is greatly enriched by both groups working through similar content, or on joint projects, and sharing their findings.

Through the Dialogues Project, for example, learners at a few schools in the Western Cape have been working collaboratively with schools in the United Kingdom. Each class teacher set his or her class a project on their school and community. The children wrote about and took photographs of their environment. These were sent to the children on the other continent, who commented on and asked questions about the project. By working on similar topics, teachers were able to plan together and support one another, while the children made new 'friends' and learnt about their own and other contexts.

One of the greatest strengths of the Internet is that it integrates the WWW and e-mail communication. This means that, when visiting a website, you can 'interact with it' by responding to questions, filling in forms or writing comments that are delivered using e-mail.

Getting connected

Any individual or school can 'get connected' to the Internet if they can afford it. How you choose to connect to the Internet is very relevant. Either you can use a telephone connection (dial-up networking) through a modem, or you can have a dedicated line that permanently connects you to Internet through an ISDN line. With a dial-up connection, the user pays for a monthly subscription to an Internet Service Provider (ISP), and the costs of the local telephone calls to the ISP. A dedicated connection is much more expensive, but downloading information from the Internet is much faster. Users are charged a monthly subscription for the line, as well as a specified amount for traffic (how much it is used).



You can subscribe to Edufax by e-mail (john@edufax.co.za) or fax (0126546757), or Telematics for African Development (TAD) by e-mail (neilshel@icon.co.za), including a line stating that you would like to subscribe to TAD.

7.5

Resourcing your school



You will probably have spent about 124 hours on this module so far.

We know that the majority of South African schools do not have any computers, making it impossible for teachers to make use of the ideas in this section. We hope, however, that this will not always be the case, and in this sub-section we offer a few ideas on how you might contribute to changing this situation.

Involve and consult the school principal and school governing body

Without the support and active involvement of the school principal, the governing body and a core of staff, and without the enthusiasm of learners, attempts to introduce computers will be severely frustrated and likely to fail. You may want to introduce discussion about computers and their importance into staff meetings and school-planning sessions. While you may not be responsible for this planning or any decision-making, you can initiate the thinking process and offer support and encouragement to decision-makers who may feel intimidated by the technology developments, or overwhelmed by the enormity of the task.

Microsoft has developed a *Technology Road Map* for schools. This is a step-by-step guide designed for schools in the United States that are planning to introduce computers. It is available from Microsoft South Africa at www.microsoft.com/southafrica/education. (To receive a copy of this document, e-mail saed@microsoft.com and they can post or e-mail it to you.)



The National Business Initiative has launched a project called EQUIP for South African Schools. It has developed guides for governing bodies on how to plan for school development and improvement, and includes skills such as writing funding proposals and forming agreements with businesses. (Contact them at (011) 485 5100 or www.nbi.org.za.)

Draw on existing support and draw up technology plans

Only your school community can understand your context and what its priorities are. You and your colleagues need to make sure that you understand your current situation and agree upon a common vision for the future. This obviously involves careful and ongoing planning. It may be best to consider a five-year plan within a whole-school context. Is it appropriate to be considering buying computers if your school does not have a photocopier machine, chalkboards or chalk? Rather than focus on computers in isolation, consider the technology needs of your school as a whole. Put simply, you need to understand what you have, and what you would like. Prioritize this wish list and work on realistically achievable goals and the means of meeting these.

Approach business for donations

A number of businesses are keen to donate used technology equipment to schools, and there are various small-scale initiatives to equip schools. Schools that have shown initiative and have started to develop technology plans are well placed to make use of these donations and initiatives.

Don't focus solely on technology requirements and neglect other key issues

Often when planning to introduce computers, we focus only on the technologies: What type of computer should we get? How many do we need? What software? and so on. We neglect key considerations such as security, insurance, repair and maintenance, teacher training and ongoing technical support. These are important considerations, and require not only time and consideration but also funding. In many cases, these incur ongoing costs. They are an integral component of planning the successful introduction and use of computers.

SchoolNet is an NGO offering support to schools that are starting to use computers and the Internet. It has a national office in Johannesburg and regional affiliates. It is a very useful starting point for considering all these inter-related issues. It has provincial affiliate NGOs made up of volunteer teachers in the region. (Visit <http://www.schoolnet.org.za> for more information.)

7.6

What have I learnt?

Key learning points

Why are computers important?

- Computers are used in almost all offices and workplaces. They are an important part of society and cannot be ignored.
- People who know how to use computers have more chance of getting a job.
- Computers can improve the quality of teaching. They can be used as an educational resource.
- Learners like using computers and are motivated by them..
- But most South African schools do not have computers. This is a problem as computers can make the gap between the well-resourced and under-resourced schools and communities even wider.

First steps

- For you to use computers in your teaching, you need to be computer literate.
- To do this you can go on a course, buy your own computer or try to get a computer for staff use at your school.
- Computer competence is one of the critical cross-field outcomes of Curriculum 2005. All learners must become computer literate.
- Learners can be taught how to use computers in a special computer literacy period in a computer laboratory.
- But computer literacy classes are not enough. Teachers must also introduce computers into their subject area lessons.

Tips about using CD-Roms in education

- CD-Roms can have written text, pictures, video clips and sound on them. They are called multimedia resources.
- CD-Roms can be used as a source of information like a reference book in a library.
- CD-Roms are often used for interactive stories, or talking books for primary school children.
- When you set tasks on using a CD-Rom, plan your tasks carefully so that questions are open but structured.
- When evaluating a CD-Rom or deciding whether to buy it, consider:
 - how the information has been selected;
 - what it looks like and how easy it is to use;
 - how the information has been organized;
 - the quality of information or content.

Tips about using the WWW

- The WWW can be used to find information of general interest on almost any topic.
- It also contains news about education (such as policy developments, research reports, news and journal articles), as well as lesson ideas, work-sheets and notes from education sites.
- Teachers can use it to set class activities on a specific website or a number of websites.
- They can also get learners involved in designing their own website.

E-mail can be used:

- for personal and administrative communication;
- for sharing computer files;
- to send or receive distribution list messages;
- to subscribe to or initiate discussion groups;
- for collaborative projects between geographically separated learning groups.

A summative assessment activity

- a** What computer programmes do you have at your school community centre or library for learners to use (Word, WordPerfect, Excel, Quattro Pro, FrontPage, Presentations, Corel Draw, Paint, Image Composer, etc.)?
- b** What computer programmes do you know about that you would like your school to buy? Have you compared them with other similar products (for price and quality)?
- c** If your learners have achieved some computer literacy, what programmes do they already know how to use?
- d** Which programme(s) could you use with your learners? (Do you know how to use them? Would they be suitable for your learners' abilities?)
- e** Design two lessons in which you use these programmes with your learners.



This is your final summative assessment. It should take you about four hours.

Selected reading

On using media in practical classroom activities

Ranby, P. 1993. *Get the Picture! An Integrated Approach to English and the Media*. Johannesburg: Heinemann-Centaur,

This is a good 'hands-on' text that teachers can use to teach media literacy in an activity-based manner. It is filled with imaginative activities and, by getting learners to produce media, teaches them about the media. It is South African, practical, and most appropriate for the Intermediate Phase.

Potenza, E. 1993. *Get the Message? An Integrated Approach to English and the Media*. Johannesburg: Heinemann-Centaur,

Potenza's text is, in some ways, a companion text to *Get the Message*: it was also produced as part of the Sacred Heart school's integrated studies programme. It is a practical text that includes some very useful ideas about using media in different learning areas. It is recommended for the Intermediate Phase.

Media in Education Trust. 1999.

Ideas for Resourceful Teaching.
A Teacher's Guide to Using Newspapers and Magazines in the Foundation Phase.
A Teacher's Guide to Using Newspapers and Magazines in the Intermediate Phase.
 (All published by the Media in Education Trust, Durban.)

These South African guides were written for use by teachers in Foundation, Intermediate and Senior Phases. They comprise a range of media resources to enhance teaching and learning. The guides are simple and practical 'how to' guides; they don't provide any in-depth media or educational analysis.

Cooper, R. and Rinvoluceri, M. 1991. *Video*. Oxford: Oxford University Press.

A rich source of video-based activities for teaching second languages (many can be adapted for languages other than English). Also includes a section on how learners can be involved in making videos themselves. This British text is also a practical 'how-to' text rather than a theoretical examination of media.

On understanding media and developing media literacy

Prinsloo, J. and Criticos, C. (Eds) 1991. *Media Matters in South Africa*. Durban: Media Resource Centre, University of Natal, Department of Education.

An excellent, South African collection of articles (some illustrated) on a wide variety of media education topics. Most of the articles are written by practising teachers who explain how they have used media in their own teaching. It also includes some very accessible theoretical articles on media literacy.

McMahon, B. and Quin, R. 1986. *Real Images: Film and Television*. Melbourne: MacMillan Australia.

This Australian text teaches learners about media literacy by building a series of key concepts systematically throughout the book. The text is filled with helpful diagrams charting the way. It is most appropriate for Senior and Further Education Phases and includes a good blend of practical activities and theoretical explanation.

Young, D. and Regnart, C. 1992. *Media and Meaning*. Cape Town: Oxford University Press.

Another South African text for use in class, this book includes chapters on architecture, art, clothes and comics, as well as the more obvious popular media. Well-illustrated, and with some useful activities, it is an accessible theoretical engagement with media literacy.

O'Sullivan, T., Dutton, B. and Rayner, P. 1994. *Studying the Media: An Introduction*. London: Edward Arnold.

A good introduction to media theory, with interesting chapters on media production and audiences.

Hartley, J. 1982. *Understanding News*. London: Routledge.

Although this book analyses the press and electronic media in Britain, it is a useful study of how, both consciously and unconsciously, the media in general, and the journalists and editors who work for them, present the world in ways that are not simply 'transparent'.

De Beer, A. (Ed.) 1995. *Mass Media for the Nineties: The South African Handbook of Mass Communication*. Pretoria: Van Schaik.

Intended mainly for South African students of Communications or Media Studies, this quite comprehensive illustrated book provides all sorts of useful information and theoretical comment on all aspects of the popular media (even Public Relations). Draws specifically on local media, or on what is or has been available to South African audiences.

On developing critical reading skills

The Critical Language Awareness Series (ed: Hillary Tanks):

Granville, S. and Sandham, M. 1993. *Language, Advertising and Power*.

Jancks, H. 1993. *Language, Identity and Power*.

Jancks, H. and Sandham, M. 1993. *Language and Position*.

Rule, P., Sandham, M. and Jancks, H. 1993. *Language and the News*.

All published by Hodder & Stoughton/Witwatersrand University Press, Johannesburg.

This *Critical Language Awareness Series* of slim A4-format books is an excellent source of locally-relevant material and activities, specifically written and compiled for teachers of critical media literacy in South Africa.

Eltie. 1997. *Multilingual Learning – Working in Multilingual Classrooms*. Cape Town: Maskew Miller Longman.

An accessible and interactive text that aims to instruct teachers how to teach reading, writing and speaking in South African classrooms. It is an excellent text that covers theoretical issues, such as power and language, as well as provides useful practical advice about how to assess language learning.

On understanding computers and developing computer literacy

Collins, J., Hammond, M. and Wellington, J. 1997. *Teaching and Learning with Multimedia*. London: Routledge.

An accessible and interesting introduction to teaching skills, for example, reading, information handling and media literacy, through the use of multimedia such as various kinds of CD-Roms (talking books, encyclopaedias, etc) and the Internet. It is a British text, so many of the discussions about the potential of technology in teaching need to be tempered by South African realities.

de Cicco, E., Farmer, M. and Hargrave, C. 1999. *Activities for Using the Internet in Primary Schools*. London: Kogan Page.

As the text suggests, this is a very practical, hands-on guide (it commits itself to not using jargon!) on how teachers can use the Internet to teach. It is a British text but is outcomes-based. It is primarily aimed at Foundation, Intermediate and Senior Phases, but many of the ideas could also be used at a Further Education Phase. It has reference to many very useful websites.

Tiffin, J. and Rajasingham, L. 1995. *In Search of the Virtual Class – Education in an Information Society*. London: Routledge.

A fascinating study of how computer technologies are changing society, learning and thus schools. It doesn't explain how computers can be used in teaching but does provide an interesting and accessible introduction to the changing context in which this kind of teaching will occur.

Lundall, P. and Howell, C. 2000. 'Computers in Schools - A national survey of information communication technology in South African Schools'. Cape Town: Education Policy Unit, University of the Western Cape.

If you are interested in how many schools in South Africa are connected to the Internet, how they use the Internet and what is being done in South Africa to increase access, this report will be useful. It doesn't explain anything about how to use computers but does contextualize computer use in South African schools.