Good works in information technology at Hallet Cove School

BY BRENTON NORMAN
Coordinator, Information Technology
Hallett Cove School

Henley High School and Hallett Cove School in Adelaide may exemplify many schools across the country in terms of the limited availability of up-to-date hardware, depth of teacher expertise and students' access to and competence in the use of computers.

Microsoft Works (Version 2) is still a very practical package which runs well on basic computer systems such as IBM XTs and a main stay of our Year 8, 9 and 10 information technology courses.

In this article these courses are outlined, demonstrating a breadth of focus which is intended to address the national expectations, the application of computers across the curriculum and a well structured whole-of-school approach.

INTRODUCTION
A lot of well-deserved attention is being given to projects being conducted around our state and elsewhere which promote the latest developments in technology education using exciting and innovative software on appropriate hardware platforms which, frequently these days, involve powerful processors and sophisticated displays.

In this report I offer my contribution which is designed to suit a school context where the Information Technology resources in terms of hardware, software, teacher expertise and student skills are limited. Kathy Watson reported at the ACEC '93 that, in a sample of primary schools, 'the number of computers ... varied between two and fourteen.' and that '... the actual level of skill, experience, and knowledge... was minimal.' Other authors and less formal comments heard at the conference suggested that a significant proportion of secondary schools (could it be as high as 50% perhaps?) while usually better off than this, are still making do with basic equipment (including old Apple IIs and old BBCs) in limited numbers. While the vanguard schools are able to work with exciting packages in various forms it goes without saying that students and teachers working in these less advanced information technology environments also deserve constructive support. Microsoft Works (Version 2 for DOS) is still a very useful product, especially so on basic PC hardware such as that possessed by many schools.

CONTEXT
The Year 8 and 9 information technology (computing) courses outlined here have been developed on and for IBM XT compatible hardware (initially Amstrad 1640s with monochrome monitors) by a collection of teachers from a variety of curriculum areas (science, English, business education, mathematics, for example) at Henley High School during 1992. In this form they attracted one of the 23 TEFA Teacher Awards presented as part of National Technology in Education Month at ACEC '93. They are currently being adapted to accommodate highly commendable existing courses on similar machines at the relatively new Hallett Cove School. There is no doubt that similar activities could be managed on the Macintosh platform and, out of necessity more than choice, some flexibility in this regard has been built into our programs. The great majority of the work done makes use of Microsoft Works (Version 2 for DOS). We use 9-pin dot-matrix printers.

Important dimensions addressed by the courses include a focus on computing across the curriculum and the principles outlined in the recently published Technology for Australian Schools Interim Statement including the draft National Profiles. We also wish to operate in the context of a curriculum plan for the school designed to give all students basic information technology skills and knowledge both for the general curriculum and in preparation

Brenton Norman has been Coordinator in mathematics and information technology at the Hallet Cove School since 1993. The school caters for 1100 students from Reception to Year 10 and will move into Years 11 and 12 in the next two years. He is currently undertaking his Masters course and has a general interest in mathematics, science and computer science. His other interests include sport, recreational music and reading.
for more competent entry to senior IT course later on.

The courses are task-based and the DMA strand receives particular attention in that, for each assignment, students are required to develop and submit a 'product' for assessment. The 'product' is usually a document of some type. In the early learning stages it is the output from a specific task with clear guidance indicated (such as a section of text that has required editing) and later on it is the result of the students' own design endeavours (such as a brochure for parents who might visit the school to learn about the computers their children are using). As part of the knowledge development students discuss and report on computer hardware and software and in this way the systems strand is also addressed. The information strand is represented by the students gathering and interpreting information using technology in the school's Resource Centre and by developing ways of communicating information that include written text, graphics and verbal presentation. The tasks are designed to enable students to see the relevance of their computers in a variety of areas of the curriculum including English, sport, science, mathematics and the humanities.

This is always negotiable with representatives of all areas of study and the objective here is to facilitate the use of computers in the delivery of the whole school curriculum. This aspect is especially relevant in the typical school where teacher expertise and hardware/software accessibility is limited and restrictive.

In addition the approach taken in developing the tasks has provided students with the opportunity to begin to develop time-management skills required for resource-based studies in later years.

**EQUIPMENT**

Our students in these courses currently use a laboratory based on up to 13 EETO16TEPC/XT computers without mice, recently augmented with 3 new 486 machines. There are four Epson LX850 9-pin dot matrix printers shared between sets of three or four computers. The students are each issued with a 360 KB disk which normally becomes their personal property.

**CLASSES**

Classes frequently contain more than 16 students and so there is a need for some students to share use of computers. It is therefore assumed that all students may share tasks in groups of up to two unless there is a specific statement otherwise. Further work may see the development of activities which will better assess individual students' work.

Students can have supervised access to the computers out of normal class time, particularly during lunch breaks.

**THE COURSES**

**Year 8**

The original Year 8 course was developed for a semester of two 45-minute lessons per week (about 40 lessons maximum, reduced to the low 30s by the usual variety of other activities which make their demands on available teaching time). For 1993 it had to be adapted to a one-term (8 weeks before reporting), three lesson per week (24 lessons) timetable allocation. This year (1994) it will have 13 weeks of three lessons per week (39 lessons maximum).

We try to accommodate 6 activities devoting (nominally) about five to six lessons to each one. It is a compulsory course for all Year 8 students. A major aspect of this course is the introduction to word processing using Microsoft Works (Version 2 for DOS).

**Rationale:**

In Part 1 students are provided with a disk copy of a document which they are required to edit using Works according to specific instructions. These include inserting characters, words and lines, deleting characters and lines, replacing characters and deleting, copying and moving blocks.

Part 2 requires students to use Works to create an original poem and present it according to specific formatting instructions using bold, italics, underlining and centring.

Part 3 requires the students to print their output and present it for assessment in a well-organised way. At this stage the printing system is discussed.

**Assignment #2 (Word Processor use, English)**

In Part 1 students are provided with a disk copy of a document which they are required to edit using Works according to specific instructions. These include inserting characters, words and lines, deleting characters and lines, replacing characters and deleting, copying and moving blocks.

Part 2 requires students to use Works to create an original poem and present it according to specific formatting instructions using bold, italics, underlining and centring.

Part 3 requires the students to print their output and present it for assessment in a well-organised way. At this stage the printing system is discussed.

**Rationale:** Students can be using word processors in a lot of their work in this and other courses. Existing programs at Hallett Cove give them initial training in keyboard use as Year 6/7 students and this Year 8 task is a logical extension. While this part of the course focuses more on training and less on DMA I believe it is appropriate given the fact that many of our Year 8 students do not come through our own Year 6/7 program and numbers of them have very limited skills (or none) in the use of computers, word processors or, in some cases, keyboards of any sort.

**Assignment #3 (Technology, English)**

Students are required to design and to use Works to produce a brochure, directed at parents who may be visiting the school for after-hours courses in computer use, in which they outline the features and operational procedures of the computers. No specific layout or format directions are provided. Content is directed by the assignment notes.

**Rationale:** At this stage some emphasis is given to the MS-DOS operating
system to the point that students have the opportunity to understand the directory structure it uses and basic file management skills so that they can develop some degree of independence in their use of the machines whenever this may occur. Otherwise, for example, students often 'lose' important files by saving them in inappropriate places and then do not know where to find them later. While this can still happen its incidence is reduced. Students also need to learn about appropriate and inappropriate file names so that they do not 'lose' their work because the operating system has used an adaptation of an unsuitably formatted file name (such as one with a space in it).

This exercise clearly focuses on the DMA strand by having students investigate, devise, communicate, produce and reflect in appropriate ways. It also addresses the Information strand.

Assignment #4 (Reporting/presentation) In groups of up to 3 students are required to prepare a 3-minute presentation to the whole class about an aspect of the history of the development of computers. They are invited to use whiteboard, photocopier and overhead projector to supplement their talk and presentation is assessed in all aspects (notes, diagrams, verbal style and length, for example). This activity represented a culmination of the previous one-term course in that students will be using the Works word processor to prepare notes for other students and the content of their talk will relate to the research they have done in the first exercise.

Rationale: In my view this is a classic task representative of the DMA approach in action with students not only demonstrating acquired skills but also applying them in a practical way and expanding the effect of their work to relate to a wider community, albeit a group of their own classmates.

Assignment #5 (Programming, mathematics) Students are required to design solutions to certain simple problems using Logo.

Rationale: Logo offers an excellent environment in which students can investigate and explore, especially in the area of Mathematical concepts. In particular the Geometry component of the Year 8 Mathematics course provides a good range of activities on which to focus in this computing exercise.

Assignment #6 (Drawing and design) Students are required to use a drawing package to create a piece of art work and a certificate for the course.

Rationale: This is intended as an elementary introduction to the skills required in the use of a computer drawing tool as a prelude to development of CAD skills in later courses. It will require either the use of our Macintoshes or the installation of a suitable drawing/painting program which we do not currently have on the XTs.

Journal Students are required to keep a journal throughout the course. In it they are expected to maintain a log of work done, not so much in a detailed lesson-to-lesson way but more in the form of an overview of the course with sections which could be interpreted as mini user manuals so that, again, they can become independent computer users. It will also include homework exercises.

Assessment and Reporting including Self Assessment Each assignment and the journal are assessed with equal weight. Grades A, B, C, D and U are awarded according to clearly stated criteria for each assignment. For recording purposes these grades (together with '+' or '-' variations) are translated into scores out of 20 with full marks being reserved for exceptionally good work. The pattern currently suggested for this translation is as follows: A+ as 19, A as 18, A- as 17, B+ as 16, etc. The final result is expressed as a percentage and then grades are determined for reporting to the students themselves and their parents based on following scale: A ≤ 75%, B ≤ 65%, C ≤ 50%, D ≤ 30% and U < 30%.

In this way students can be quite clear about what is expected of them to receive satisfactory assessments of their work and to gain appropriate credit over the whole course.

Students are also expected to use Works to write a statement of self assessment, one copy of which is included in their report package.

Course Appraisal Finally students are expected to use Works to write an appraisal of the course. One copy becomes part of the report package for parents. One copy is made available to the school so that students' impressions can be taken into account when modifications are planned.

Comments: Students who have so far provided a course appraisal for this course were quite supportive describing it as 'interesting', 'fun' and 'reasonably easy', reporting that they 'enjoyed' it and that they 'learnt a lot' and 'learnt interesting things'. Some said they found some parts hard and would have appreciated better computers.

Year 9 The original Year 9 course was developed for a semester of two 45-minute lessons per week (about 40 lessons maximum, reduced to the low 30s by the usual variety of other activities which make their demands on available teaching time). It now operates in a slightly modified form at Hallett Cove with a similar timetable allocation (on average 2+ lessons a week for a Semester).

Currently we try to accommodate 6 activities devoting (nominally) about five to six lessons to each one. In part the course attempts and further develop skills in the use word processors, and to introduce spreadsheets and databases using Microsoft Works (Version 2 for DOS).

It has been a compulsory course for all students although in 1994 certain subject choices will not allow some students to participate.
Introduction
Building on what was done in Year 8 we begin with a class discussion of modern personal computer systems such as the ones being used in the course.

Assignment #1 (The MS-DOS operating system, information technology)
Students are provided with a disk containing game files which have incorrect file names and which have been placed inappropriately in various directories on the disk. Their task is to reassemble the files and rename them so that the game runs.

Rationale: While operating at the DOS prompt is frequently avoided by most users, I believe it is worth while giving the students the opportunity to understand the underlying principles on top of which other interfaces like Windows operate.

Assignment #2 (Word processor use, science)
Part 1 requires the students to use Works to enter and edit a given document with a Science focus and to format it according to specific instructions using bold, italics, underline, blocks, centring and inserting lines.

Part 2 requires students to use Works to create a table of information and to format it according to specific instructions using tabs, indents and centring.

Rationale: Students can be using word processors in a lot of their work in this and other courses. Existing programs at Hallet Cove have given them training in keyboard use as Year 6/7 students and word processor use as Year 8s. This is a logical extension. While this part of the course focuses more on training and less on DMA I believe it is appropriate further development of word processing skills developed up to Year 8.

Assignment #3 (Technology, mathematics)
Students are required to develop Logo programs to achieve specified goals which can be of the students' own choosing. The DMA strand is clearly emphasised here but students are not required to express this in a formal way. There is an opportunity to give students access to the Lego connection either using Lego Lines, Lego Logo or other similar technology-oriented software.

Rationale: Programming tasks are valid, not so much for their own sake, but as means for students to gain an understanding of their capacity to control the machine as well as to support other aspects of their learning including the application of logical thinking, mathematical logic in particular and more general problem solving skills.

With modifications to the Year 8 course in place it may be that this exercise is replaced by something else with some similar requirements, perhaps using Hypercard on the Macintosh.

Assignment #5 (Research, humanities)
With databases as the focus students are required to access the Resource Centre's computer facilities including the Dynix computer catalogue, CD-ROM and Nexus and report on their findings. Presscom is also mentioned here, more as an extension exercise since the school does not currently subscribe. As it stands this is a 'fill the slots' exercise which could be further adapted to better meet the goals of the national technology programs. The focus of their research is intended to help them with a possible later exercise.

Assignment #6 (Databases)
Students are required to use Works to develop a simple database of their own design in the context of either a home delivery pizza kitchen or a supplier of farm machinery and to produce simple output from it. An excursion is possible if time permits in this to observe the use of databases in the management of local businesses.

Rationale: With databases holding the important place that they do in real-life Information Technology applications and with individuals being implicated as we all are in this database technology, students have the opportunity to develop an understanding of what is involved and what some of the associated issues are. DMA obviously applies, although sophisticated output is not expected.

Other activities (if time permits)
Assignment #7 (Report, humanities)
Students are required to use Works modules to report on 'computers in our world' and some of the issues involved.

Rationale: This task requires an understanding of various parts of the preceding components of the course and an ability to prepare a report drawing in examples to support points made. It has become something of an extension exercise firstly because we often run out of time to fit it in and secondly because of its more difficult nature. This activity does provide a link with the Year 10 course discussed briefly below.

Journal
Students are required to keep a journal throughout the course. In it they are expected to maintain a log of work done, not so much in a detailed lesson-to-lesson way but more in the form of an overview of the course with sections which could be interpreted as mini user manuals so that, again, they can become independent computer users.

Assessment and Reporting including Self Assessment
As in Year 8 each assignment in the Year 9 course and the journal are assessed with equal weight. Grades A, B, C, D and E are awarded according to clearly stated criteria for each assignment. For recording purposes these grades (together with '+' or '-' variations) are translated into scores out of 20 with full marks being reserved for exceptionally good work. The pattern currently suggested for this translation is as follows:
A+ as 19, A as 18, A- as 17, B+ as 16, etc. The final result is expressed as a percentage and then grades are determined for reporting to the students themselves and their parents based on a following scale: A ≥ 75%, B ≥ 65%, C ≥ 50%, D ≥ 30% and U < 30%. In this way students can be quite clear about what is expected of them to receive satisfactory assessments of their work and to gain appropriate credit over the whole course.

Students are also expected to use Works to write a statement of Self Assessment which is included in their report package.

Course Appraisal

Finally students are expected to use Works to write an appraisal of the course. One copy becomes part of the report package for parents. One copy is made available to the school so that students' impressions can be taken into account when modifications are planned.

Comments: Students who provided a course appraisal reported that the course 'taught (them) a lot', was 'interesting', that they 'enjoyed it very much', were 'happy with the work done' and 'now use computers better'. Some, however, found the expectations hard to meet.

Year 10

The main existing Year 10 course, a choice subject, is an extension of the Year 9 one described above with greater emphasis on research and reporting and documentation in general. We have tried to build the course around 5 activities over a semester of 4 lessons each week (5 in 1994) and each activity requires significantly more commitment and independence from the students than is expected in Year 9. The style of the course is intended to give students an opportunity to develop skills appropriate for successful entry and completion of future studies in general with their increased emphasis on resource-based learning. The Works word processor is used extensively in report writing and the Works database and spreadsheet modules are the focus of an exercise each.

The course covers personal computer systems in a group report; the application development process in a Logo programming environment; spreadsheet applications; the history of development of information technology; and an appreciation of the prevalence of databases and issues associated with them.

Other Year 10 courses which more obviously address the DMA approach (desktop publishing and programming, for example) have also been developed and offered to students for 1994.

Tasks are weighted within the course, including a folio. Students are also expected to complete self assessments and course appraisals. Many of the students who took the Year 10 course during Semester 1 in 1993 were awarded an A for their work. However a significant number reported that they found the work load difficult to manage. As with the Year 8 and 9 courses their comments have been noted and will be borne in mind as the course develops.

SUMMARY

While not 'state-of-the-art' courses in terms of modern national hardware and software options I believe the work initially done by the group at Henley nevertheless has something significant to offer. It has provided a constructive means of presenting information technology to junior secondary students in a context where hardware, software, teacher expertise and student skills may not be in an advanced state. It addresses aspects of the national statement as well as local policies within a structure which supports a whole school information technology program. While these courses are very likely to change and develop I believe they offer a very reasonable and appropriate basis from which to proceed. With a group of teachers involved again from varied areas of study and the prospect of new equipment we are enthusiastic about our progress.

Disk copies of the original documents with comprehensive documentation exist in WordPerfect 5.1 and Word for Windows 2 formats.

REFERENCES


ENDNOTES

2. Newhouse; Roberts and Albion; and others
3. Hallet Cove School caters for nearly 1100 students from Reception to Year 10 and we will be moving into Years 11 and 12 over the next two years. There are about 180 Year 8s, 150 Year 9s and 100 Year 10s, about 350 of which total will be involved in information technology courses at some time or other during the year, with about half that working in each semester. Our hardware resources for Years 6 - 10 students consist of two laboratories, one of 13 - 16 IBM XT compatibles and one of 15 - 20 Macintoshes.
4. Consider as an example a student who has recorded A(17/20), A(17/20), A(17/20) and D(9/20). Is an overall A deserved? The score is 60/80 or 70%.
5. The Word for Windows format has been obtained by conversion from the WordPerfect version and is not yet as complete or error free. 

continued from page 22


32

AUSTRALIAN EDUCATIONAL COMPUTING, MAY 1994