COMPUTER STUDIES IN WESTERN AUSTRALIA

INTRODUCTION

In Western Australia the generic term "Computer Studies" covers a range of subjects from Years 8 to 12. In the context of this article, those subjects usually described as "Business Education" subjects will not be discussed. Typically Business Education subjects cover concepts and skills such as accounting, office management and typing. There is a degree of overlap between "Business" and "Computing" subjects with areas such as word processing and spreadsheet manipulation.

Traditionally the two areas have remained separated. It is reasonable to assume that they will eventually merge together.

All primary and secondary education in Western Australia comes under the authority of the Western Australian Curriculum Council. In Lower secondary (Years 8 to 10) the specific content of each subject is at the discretion of the school. Within the guidelines of Curriculum Council requirements schools are free to develop and run their own subjects. There is a core of ‘traditional’ lower school Computing subjects covering topics such as word processing, spreadsheets, databases, communications, digital media, web page creation, and programming. Lower school Computing subjects are usually offered on an ‘option’ basis with individual students selecting whether, or not to enrol. Schools are able to manipulate the content and context of these subjects to cater for the needs and expertise of their students and teaching staff. This document will focus primarily on Upper school Computing.

There are six Computing subjects offered in Upper school (Years 11 and 12). Two are "Tertiary Entrance" subjects called "Information Systems". The other four are "Wholly School Assessed" subjects called "Personal Information Technology", "Digital Media", "Interactive Multimedia" and "Industry Information Technology".

The structure and content of these subjects will be discussed later in this document.

DEMOGRAPHICS

The following Curriculum Council information for the year 1999 provide a ‘snapshot’ of the state of Upper school Computing subjects in Western Australia.

There are no figures available on the ratio of Male to Female Computing teachers. Anecdotal evidence indicates that while the early years of Computing in Western Australia were male dominated, the trend is changing.

As the following table indicates, Computing subjects are dominated by males. This follows the world-wide trend and is not unexpected. The reasons behind this pattern is perhaps a concern that should be addressed. ICT skills are

<table>
<thead>
<tr>
<th>Year</th>
<th>Tertiary Entrance</th>
<th>Wholly School Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Information Systems</td>
<td>Personal Information Technology</td>
</tr>
<tr>
<td>12</td>
<td>Information Systems</td>
<td>Personal Information Technology</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Digital Media</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Interactive Multimedia</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Industry Information Technology</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Industry Information Technology</td>
</tr>
</tbody>
</table>

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Western Australian schools offering the following subjects in Year 11:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Government</th>
<th>Non-Govt.</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Systems</td>
<td>26</td>
<td>15</td>
<td>673</td>
<td>275</td>
</tr>
<tr>
<td>Personal Information Technology</td>
<td>65</td>
<td>32</td>
<td>1321</td>
<td>1172</td>
</tr>
<tr>
<td>Digital Media</td>
<td>49</td>
<td>38</td>
<td>1371</td>
<td>719</td>
</tr>
</tbody>
</table>

Source: Secondary Education Statistics (Years 11 and 12) 1999, Curriculum Council, Perth, Western Australia.

becoming an essential aspect in most employment situations. Do these figures indicate that girls will be disadvantaged when they move into the workforce?

Of particular significance is the dramatic difference between the number of girls and boys studying Information Systems. This is the only Year 11 Tertiary Entrance subject offered as a Computing subject. It could be assumed that this trend continues into University and TAFE. Does this mean that girls see no benefit in studying formal Computing subjects in Year 11? Does it mean that they have no intention of studying Computing subjects at Tertiary level? Do they believe they already have the necessary computing background? Do they intend picking up their computing skills at a later time?

It would be of even greater significance if this pattern indicated a feeling of alienation on the part of girls against computing subjects. If this were the case, we would all have a lot of work to do.

**DESCRIPTIONS OF ACTIVITY (COURSE CONTEXT & CONTENT)**

"Information Systems" Years 11 and 12 are Tertiary Entrance subjects. In theory only the Year 12 subject needs be studied, but the practice in most schools is that the course is conducted over two years with the Year 11 subject considered a prerequisite for entry into the Year 12 subject.

This subject is a rigorous course of study conducted at a level along the lines of Upper school Physics and Chemistry. The Year 11 subject looks at "systems" in general. Computing systems may be included in the list of areas considered, but this is not a subject "about computers". A study of Information Systems could lead on to any area of employment involving "systems". Typical career paths discussed with Information Systems students include Libraries, Hospitality and Tourism and perhaps Information and Communications Technology. The Year 12 subject covers database theory and programming, but it is not a subject about programming. The course produces people with an understanding of how "systems" work, not programmers, or technicians.

Year 11 "Personal Information Technology" is a general software skills subject. This subject is typically taken by Upper school students with a limited Lower school background in Computing. Many schools with a structured Lower school Computing program are of the view that their students already have the essential skills when they reach Upper school and do not offer this subject.

Year 11 "Digital Media" provides students with the skills needed to create multimedia products. Students studying Digital Media would be working individually and as part of a group, working with scanners, digital cameras, graphics packages, multimedia authoring software and so on. In this subject there is a reduced emphasis on paper-based products.

Year 12 "Interactive Multimedia" is a logical progression from Digital Media. In this subject, students build upon the skills developed in Digital Media to critique and create examples of high-level interactive multimedia.

Year 12 "Industry Information Technology" is an attempt to move the focus away from business and home based computing and look at the way "industries" use Information Technology (IT). Students enrolled in this subject may typically prepare a report on the use of IT in a car manufacturing plant, or in Robotics, or movie special effects, or the use of in the military and so on. The aim of this subject is to expand the IT experiences of the student and move them on from office-based applications.

All Upper school Computing subjects in Western Australia are "Outcomes" based. Each subject is defined by a set of outcomes (usually ten) and explanatory "dot-points". Students progress through each subject by completing "Tasks" that may engage them for period ranging from a week to several months. At the completion of a Task the teacher assigns a "level" of "Satisfactory", "High", or "Very High". If the student fails to satisfactorily complete the task a "Not Demonstrated" is awarded. At the end of the year the Levels a 'aggregated' to produce a grade of A, B, C, D, or E.

With the move in Western Australia toward "Student Outcome Statements" (SOS) and a "Curriculum Framework" (rather than discrete "objectives") Lower school subjects are evolving into a similar structure to the Upper school model described above. The main difference being that students will be reported in terms of a "level", rather than a grade.

Western Australia is currently engaged in a review of "Post Compulsory Education" (ie Years 11 and 12). The SOS structure will be expanded into Upper school. The final result will possibly be the evolution of Upper school strategies towards what is proposed for Lower school under the Curriculum Framework, resulting in a seamless continuum from Years K to 12.

**PROFESSIONAL DEVELOPMENT OPPORTUNITIES**

Teachers in Western Australian Government schools are allocated a fixed amount for "Professional Development" (PD). This usually works out to be one school day. Individuals are free to negotiate higher levels of 'funded' PD and engage in PD in their own time, but the
level of centrally-funded PD is restricted by the availability of funds. The situation in non-Government schools is possibly a little better, but the bottom line is that it is an expensive process to allow teachers out of classrooms for PD. Recent increases in funding from the State Government to all Western Australia schools has improved the situation considerably, however this funding must also be shared with hardware and software purchases and there is no guarantee it will continue past 2002.

In terms of "opportunities", Western Australia teachers are well catered for. The State's geographical isolation does not appear to deter national providers of PD. There are many opportunities for teachers in Western Australia to attend quality PD courses and conferences.

ECAWA'S INVOLVEMENT IN COMPUTING IN WESTERN AUSTRALIA

The Educational Computing Association of Western Australia (ECAWA) is intimately involved in all aspects of Computing education at a State, national and International level. Its role and contribution to the development of IT in schools ranges from involvement on Syllabus Committees to resource development to conferences, camps, informal get-togethers, Software Interest Groups, formal PD and so on. To fully outline the contribution of ECAWA to Computing in Western Australia over the past 20-odd years would occupy several books and is well beyond the scope of this article.

COMPUTER STUDIES ISSUES IN WESTERN AUSTRALIA

Our State Government recently sold rights to the gas pipeline between Dampier and Perth. Part of the proceeds from that sale were directed to improving the state of IT in schools. By 2002, all schools in Western Australia will have received sufficient funds to purchase computers to the ratio of "1 to 5" in secondary and "1 to 10" in primary. There has been a massive injection of funds for hardware into schools. In many cases the school's existing hardware investment has allowed them to re-direct money into staff PD and network infrastructure. Schools generally have an adequate hardware base. The question now, of course is ... Where to next?

The issue of technical support for Government schools has not yet been resolved, although there does appear to be hope on the horizon. While the strategy adopted by Victoria does not appear to have addressed all the technical support issues faced by schools, it is a definite improvement over zero technical support!

The key word over the past twenty years has been "change". More so than any other area of education, IT has undergone continual change since the early eighties. To a large extent, individual teachers have been left to manage that change in their own way. Western Australian Universities are now addressing this issue by way of undergraduate and postgraduate courses directed specifically at the IT teacher. This support should theoretically lead to better prepared graduates and assistance for those already involved in IT in schools.

The next looming area of "change" for Western Australian Computing teachers is the outcome of the "Review of Post Compulsory Education" in this State. At the very least, IT teachers can expect to be required to review all of their current Upper school courses and possibly start from 'scratch' for many (if not all) of them. It will be an exciting time.

WESTERN AUSTRALIAN CONTACTS:

The Educational Computing Association of Western Australia
http://www.ecawa.asn.au/

The Curriculum Council Of Western Australia
http://www.curriculum.wa.edu.au/

The Education Department of Western Australia
http://www.eddept.wa.edu.au/

The Association of Independent Schools of Western Australia
http://www.ais.wa.edu.au/

The Catholic Education Office of Western Australia
http://www.ceowa.perth.catholic.edu.au/