The all Encompassing Role and Function of the Computing Coordinator in Western Australian Government Senior High Schools

Diana C. Brown

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THE ALL ENCOMPASSING
ROLE AND FUNCTION
OF THE
COMPUTING COORDINATOR
IN
WESTERN AUSTRALIAN GOVERNMENT
SENIOR HIGH SCHOOLS

by

Diana C Brown  B.A. (Ed)

A Thesis Submitted in Partial Fulfilment of the
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of
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ABSTRACT

The purpose of this study was to determine the role and support afforded Computing Coordinators at Western Australian government senior high schools by undertaking a census survey.

Previous studies performed by Weber and Kershaw (1990) and Kershaw and Weber (1991), portrayed the role of Computing Coordinators at Australian high schools as demanding a diversity of knowledge and skills in computer technology together with excellent management qualities. The literature also suggested that time management skills were a major factor in how effectively coordinators carried out the myriad of tasks expected of them.

This study found that most Computing Coordinators considered their roles too onerous with the majority not awarded time to specifically perform their coordinating duties. This study also determined that most coordinators were using a proportion of their teaching time and a considerable amount of their class preparation time, managing computers. Considering the possible impact this could have on student learning, it was not surprising that most Computing Coordinators felt that their coordinating role seriously impinged on their role as a teacher.
Computing Coordinators offered a range of solutions to the pressures they were experiencing in their coordinating role. The majority of these solutions involved increased financial assistance. It was considered by many coordinators that the purchase or lease of up-to-date equipment, hardware and software, may require less maintenance than older equipment and therefore reduce the time they spend on managing computer systems. Coordinators felt that greater support for professional development was essential to enable them to keep their computing skills up-to-date and for teachers using computers in the curriculum to further their skills in computer technologies. Also, adequate time for Computing Coordinators to perform their duties, along with the provision of a computer technician, currently lacking in most government senior high schools, were seen as necessary steps to reducing the pressure on coordinators.
DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education;

(ii) contain any material previously published or written by another person except where due reference is made in the text; or

(iii) contain any defamatory material.

Signature: 

Date: ...}_{April}. 1997.
ACKNOWLEDGMENTS

I wish to thank all of the Computing Coordinators who demonstrated their recognition of the need for this study by giving up some of their valuable time to take part. The high percentage of respondents has given this study greater credibility.

I would also like to express my gratitude to my supervisor, Paul Newhouse, for his understanding and assistance which was given freely when requested.

Diana Brown
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Chapter 1

Introduction

At the beginning of the 1990s, Kershaw and Weber (1991) conducted a survey of Computing Coordinators to determine their role and work in Australian high schools. They found that Computing Coordinators typically required a diversity of knowledge and skills in the broad spectrum of computer technology and a willingness to invest a considerable amount of their own personal time. These demands necessitated the ability to cope under pressure in the performance of the myriad of tasks necessary to enable the smooth running of the ever expanding computer technology within their schools. Now, over five years later, while the quantity of computer technology in Western Australian senior high schools is continuing to increase, it is unclear whether the position of Computing Coordinators has improved.

The current initiative by the Education Department of Western Australia (EDWA, 1996a) to provide technical support for computing equipment in all Western Australian schools by the year 2001 may alleviate some of the pressures placed on Computing Coordinators. However, as Kershaw and Weber’s (1991) research showed, support was long overdue and did not necessarily fully address all of the concerns felt by Computing Coordinators. This present study addressed these issues with reference to Computing Coordinators in Western Australian senior high schools.
This chapter provides background information and a rationale for this study. The problem addressed by the study is discussed along with the research questions. Finally, the method and use of data is described and any factors that could affect the understanding of this study.

Background

The roles undertaken by Computing Coordinators have been rapidly expanding as Australian schools attempt to incorporate new technology and keep pace with changes in this technology within their schools. In a limited survey performed by Hancock in 1985 (cited in Smith, 1987), it was found that of the Australian schools that had computers, they had an average of eight computers per school. By 1991, 16% of Australian high schools surveyed by Kershaw and Weber (1991) had in excess of 60 computers each. Without doubt, the number of computers in Western Australian senior high schools will have increased considerably in the five years since 1991.

The integration of computers across the curriculum seems to be occurring much slower. Despite early recommendations set down by the National Advisory Committee on Computers in Schools to “integrate computers in appropriate ways across the whole curriculum” (Anderson & Camiller, 1986, p. 122), and more recent initiatives to promote across curriculum activities in schools using Internet technologies (Education Department of Western Australia, 1996b), it would appear that the development of students' knowledge and skills in computer
technology has remained almost exclusively the responsibility of Computing Departments.

In 1987, Smith wrote that "Most practicing teachers have had no computer courses in their initial teacher training" (p. 143), consequently, they did not have the necessary skills and know-how to introduce computers into their curriculum. By 1990, Callister and Burbules (1991) considered that teachers lacked the skills to integrate computers in appropriate ways across the curriculum due to initial teacher training that promoted "a narrow technical focus that conflicts with questioning the broader educational value and significance of computers", resulting in the computer becoming "a subject unto itself" (p. 3). These shortcomings have led to computer technologies remaining under the control of Computing Departments. Consequently, providing for the care, maintenance, inservicing of staff, budget preparation and a host of other associated tasks is left to the coordinators of these departments.

Statement of the Problem

Studies performed by Kershaw and Weber (1991), Barbour (1986) and Bruder (1990) established that Computing Coordinators considered themselves placed under extreme pressure to ensure that they provide for the smooth running of computer technology within their schools, with no clear job specification in place. In addition to Computing Coordinators' normal teaching duties, they consider it their responsibility, expected or self perceived, to maintain and
evaluate hardware and software, assist colleagues and perform various other associated administrative duties (Kershaw & Weber, 1991). Kershaw and Weber (1991) found that coordinators felt obliged to stay abreast of new technology with regard to professional development and handle an ever-increasing workload as technology expanded within their schools.

In Western Australia, many Computing Coordinators also play the role of Head of Department (HOD) or Teacher in Charge (TIC) of a larger area of the curriculum. For example, the HOD of Technology and Enterprise is often in charge of Design and Technology, Home Economics, and Computing. Both HODs and TICs are required to take on a leadership role within a particular Faculty or Faculties, manage administrative and curriculum duties, provide for the needs of their team and generally perform all the necessary tasks to enable a department to run efficiently. A Computing Coordinator who has departmental responsibilities would be required to perform these duties in addition to their coordinating role. As Kershaw and Weber’s (1991) study demonstrated, this is difficult considering that many coordinators have large teaching loads requiring the usual preparation, evaluation and assessment.

A job description form prepared by EDWA (n.d.) for the appointment of Learning/Information Technology Coordinators at selected schools within Western Australia, outlined six broad duties to be performed as a requirement of the position (Chapter 2, Coordinators’ Duties). As will be shown, there were
minimal similarities between EDWA’s (n.d.) list of duties and the tasks performed by Computing Coordinators in Kershaw and Weber’s (1991) study. If Computing Coordinators in this current Western Australian study are found to be performing the various coordinating duties mentioned in Kershaw and Weber’s (1991) research and expected to do so in addition to EDWA’s (n.d.) requirements, this would only amount to placing Computing Coordinators under additional pressure. Consequently, there is an urgent need to address whether or not Computing Coordinators are given sufficient time and support to perform their coordinating duties without adversely affecting their other roles.

**Research Question**

This study specifically addressed the question:

Do Computing Coordinators at Western Australian government senior high schools have adequate support to perform their duties?

To address this research question, a number of subsidiary questions were considered.

1. What is the nature and extent of Computing Coordinators’ duties?
2. What other roles do Computing Coordinators undertake within the school?
3. Does a Computing Coordinator hold formal qualifications in computing?
4. What support is offered to Computing Coordinators in the performance of their duties?

5. Do coordinating duties impinge on other roles?

6. What are the perceptions of Computing Coordinators towards their coordinating roles?

Method

To address the research questions, Computing Coordinators at government senior high schools in the state of Western Australia were asked to take part in a census survey. This survey required that Computing Coordinators complete a six part questionnaire (Appendix A), with the aim of identifying their backgrounds, duties, the time afforded to coordinators to perform these duties, the time considered necessary to perform the duties efficiently without impinging on their other roles and to determine if there are other factors that affect their ability to carry out their duties.

Background Issues of Interest to the Study

Issues that may have an effect on the understanding or analysis of the data in this study are discussed here.

Defining the status of coordinators. This study did not request that Computing Coordinators who had departmental duties differentiate between their position as Head of Department (HOD) or Teacher-in-Charge (TIC). However, it
should be noted that the position of HOD in Australian government schools is a promotional position above that of a classroom teacher. Unlike the title of TIC, departmental heads always receive a financial incentive and are awarded time to perform their duties. As with Computing Coordinators, time allocated to TICs is at the discretion of individual schools, even though they may be performing the same tasks as HODs. This may be due to some departments being smaller than others in relation to student or teacher numbers. However, this study did not differentiated between the two positions of HOD or TIC, in relation to those coordinators given time to complete their departmental roles. Therefore, as this study only requested that Computing Coordinators state how much time they had been awarded for all of their duties other than those that related to teaching or teaching preparation, it was possible that time awarded specifically for coordinating duties was taken as time allocated for coordinators' TIC roles.

**Duties other than Teaching Time (DOTT).** Teachers at Western Australian government high schools are allocated 'Duties other than Teaching Time' (DOTT) in proportion to the number of hours they teach. As a general guide, a teacher on a full teaching load would be awarded approximately 5 hours per week DOTT. This time is used for tasks such as lesson preparation, marking and curriculum meetings. Basically, DOTT is provided for duties relating to actual teaching.

The term 'Duties other than Teaching Time' is broad and could encompass the time awarded to teachers to perform all duties other than teaching. However, it
would be expected that any titled position, such as HOD, TIC or Computing Coordinator, would have separate duties from those required to be undertaken in DOTT and adequate time awarded to complete these duties. Any DOTT used to carry out tasks involved with these titled or any other titled positions would be time taken away from providing for students' needs in the classroom.

**Limitations of Kershaw and Weber's (1991) research.** As many of Kershaw and Weber's (1991) findings are used to discuss the results of this study, it should be noted that the aim of their study was to build a "comprehensive picture of the computing coordinator in Australian secondary schools" (p. 102). This present study was designed to specifically address the role of the Computing Coordinator at Western Australian government senior high schools. Whilst comparisons made between the findings of Kershaw and Weber's (1991) study and this present study are useful, the differing samples and aims of the two studies should be taken into consideration.

A further consideration of Kershaw and Weber's (1991) study was that it included Computing Coordinators from both government and non-government Australian high schools on a national level. Their study found many differences between the public and private school systems. For example, 42% of private school Computing Coordinators considered the level of professional development support was adequate, as opposed to 7% in the public schooling system. Australian policies relating to the expectations of teachers are also different in
each state, as is the curricula. An example of this would be the 1996 Government School Teachers' Enterprise Agreement between the Education Department of Western Australia, The Australian Education Union, and the State School Teacher's Union that specifically relates to the expectations placed on teachers in Western Australian government schools. Also, it would be expected that student numbers and, in turn resources would be considerably larger in senior high schools than those found in high schools. Whilst Kershaw and Weber's (1991) sample met the aims of their study, this current research has specifically addressed the full nature and extent of Computing Coordinators' roles at the Western Australian government senior high school level, thus avoiding the use a diverse sample that has the potential to diminish the value of the data. It is recommended that further research into the roles of educators in Australian schools takes these issues into account.

Summary

This study set out to determine the support afforded Western Australian Computing Coordinators at government senior high schools in the performance of their role. This chapter has provided the background and purpose of undertaking this research, the research questions and the method used to address these questions, and outlines some issues that may affect the understanding of this study.
Literature that had a bearing on this study is addressed in Chapter 2. Previous research into the roles of Computing Coordinators within Australian and overseas' schools, along with current government initiatives as they relate to computer technology in Australian and, more specifically, Western Australian high schools, are also discussed.

Chapter 3 defines the method used to address this study. The research instrument is discussed, together with how it relates to the research questions. The research population is stated, as is how the data were analysed. Descriptive statistics are used to present the results of the study in Chapter 4. How the results address the study questions are analysed and discussed in Chapter 5 along with some solutions offered by Computing Coordinators.

Recommendations and conclusions, based on the findings of this study, are dealt with in Chapter 6. The issues raised are intended to provide Computing Coordinators' employers with suggestions on how best to alleviate some of the pressures currently placed on coordinators.
Chapter 2

Literature Review

This chapter discusses the background to the entry of computer technology into the Australian schooling system and the subsequent need for coordinators to provide for the care of this technology. Previous research that has a bearing on this current study, along with government initiatives for the use and care of computer technology within Australian and Western Australian schools is discussed.

The Evolution of Computer Technology in Australian Schools

Access to computer processing in Australian schools began over 30 years ago but had minimal application until the invention of the microprocessor in 1971 (McKeown, 1986) and the subsequent introduction of the personal computer into schools during the late 1970s (Smith, 1987). As Australian society began to consider that computing skills were essential for future employment and life in general, educational institutions reflected this need by rapidly increasing the availability of computer technology in schools (Newhouse & Oliver, 1992).

The introduction of computers into the Australian schooling system saw few teachers with computing skills, the majority having completed their teacher training prior to the invention of the microcomputer (Smith, 1987; Kershaw & Weber, 1991). Initially, secondary school computer education was an uncoordinated effort undertaken by interested teaching staff enthusiastic about computer technology. However, by the end of the 1970s, formal statewide
computing studies had been introduced in many Australian secondary high schools (Newhouse & Oliver, 1992).

In recognition of the need for computer literate teachers, computer awareness courses were incorporated into teacher training (Smith, 1987). Even as late as 1990, according to Callister & Burbules (1990), teacher training in computing was limited to “technical reification, vocationalism, and instructional behaviourism” (p. 3), targeting ‘what’ computers are rather than ‘how’ they can enhance student learning. This trend has continued in Australian high schools where Computing and Business Departments train students in computer awareness, business applications and computer science courses (Newhouse & Oliver, 1992).

Over the years, changes in computer hardware has seen computer systems become faster, smaller, cheaper and more reliable. Software has also been developed at an increasing rate to cater for the broad needs of society in such areas as robotic automation, telecommunications, security, entertainment, education and various business applications. Due to the high rate of change in computer hardware and software, some textbooks even come with annual updates so that users of technology can “keep pace with the dizzying speed of technological innovation and change” (Blissmer, 1990-1991, p. vii). For educational purposes, subject specific and content free software has been written to assist students from pre-primary to senior high school. Both industry standard and educational
software are regularly advertised in Australian periodicals such as *PC User*, where various applications are compared (Vine, 1997) or rated in view of their "best" educational suitability (Bruce, 1997). Most new software, including operating systems, a variety of integrated application software and educational software, has become more user friendly with on-line help, tutorials and Graphical User Interfaces (GUIs). Courses on how to use new hardware and software are also readily available at technical colleges, universities and private institutions. The Education Department of Western Australia is currently encouraging professional development and training in the use of computer technologies (1996a).

Since the explosion of the information era of the 1980s, much has been written about computer technology and how it can best be used and applied in schools. For example, a recent text prepared by the ACT Department of Education and Training and Children's, Youth and Family Services Bureau (1996), offers an extensive range of teaching and learning materials aimed at maximising the potential of information technologies in the curriculum. The increased drive by Western Australian educational authorities to promote across curriculum computer technology practices provides further evidence of how computers have remained predominantly the responsibility of Computing Departments (EDWA, 1996b).
Research Related to Computing Coordinators

Considering the impact implementing and caring for new and expanding computer technologies could have on teachers who cater for this equipment in Australian schools, it would be expected that much research at the school, Education Department or government level would have been undertaken to determine how staff were coping. However, to date, only two studies have been carried out that specifically relate to the roles, work conditions and perceptions of Computing Coordinators in Australian high schools. The first was a pilot study by Weber and Kershaw (1990), followed by their major study (Kershaw & Weber, 1991).

With the endorsement of the Australian Council for Computers in Education (ACCE), Kershaw and Weber (1991) conducted their survey research to determine the essential and desirable criteria for job selection as a Computing Coordinator in Australian government and non-government high schools. Kershaw and Weber's (1991) study used a random sample of 460 high schools, 20% of all Australian high schools. Of these, only schools with a person acting in the role of Computing Coordinator were asked to take part. Only 129 completed questionnaires were submitted by Computing Coordinators, approximately 28% of Kershaw and Weber's (1991) original sample. Therefore, it is possible that the reliability and generalisability of their results may be challenged as only Computing Coordinators who considered their roles too onerous or those schools that, in name only, had a person acting in the role of Computing Coordinator, may
have replied. It would seem reasonable to surmise that in 1991, with technology in schools as a high priority, a person or persons would still need to have carried out the required tasks of a Computing Coordinator.

Kershaw and Weber's (1991) study was based on similar American studies by Bruder (1990) and Barbour (1986). Although these three studies involved different samples to this current research, each of them were specifically studying the role of Computing Coordinators within high schools. Therefore, previous findings that relate to this present study, specifically those of Kershaw and Weber (1991), will be discussed in the following sections of this chapter. Where relevant, Chapter 5 will discuss Kershaw and Weber's (1991) findings along with the findings of this present study to determine similarities or differences in the roles and expectations of Computing Coordinators.

Coordinators' Duties

Whilst a full job description for the position of a Computing Coordinator at Australian high schools was not given in Kershaw and Weber's (1991) paper, they determined that "computing coordinators were expected to perform and carry out a multifarious array of tasks in addition to their teaching role", and that a "range of administrative duties and managerial decision making responsibilities formed a major part of the coordinator's role" (p. 106).
As part of EDWA’s Technology 2000 Strategic Plan (1996a), a job description form (EDWA, n.d.) was prepared outlining six duties required of successful applicants for the position of Learning/Information Technology Coordinator at a number of Western Australian schools.

1. Collaborates with others to develop and implement the school’s information technology plan.

2. Convenes regular meetings of the school information technology committee in order to plan the effective implementation of the school’s information technology priority across the curriculum.

3. Coordinates the school’s professional development plan in the area of information technology in the curriculum.

4. Promotes a collaborative school culture in order to motivate and offer support to staff across the curriculum. In particular, creates support structures for teachers developing information technology skills and applying new curriculum/IT understanding to the classroom.

5. Monitors the effectiveness of the implementation of the Technology Focus School’s Project at the school level by completing end of semester reports. These reports will provide the school and the Education Department with feedback about the implementation of the project and inform future planning.
6. Liaises with and provides leadership to other Western Australian
government principals and teachers about using information technology
to enhance teaching and learning.

When compared with the duties performed by Computing Coordinators in
Kershaw and Weber's (1991) Australia wide study, apart from 'assisting other
staff', the duties do not match those expected by EDWA (n.d.). These were, in
order of priority, hardware maintenance, assisting other staff, software and
hardware evaluation and negotiating with suppliers. The lesser duties carried out
by coordinators in Kershaw and Weber's (1991) study of providing computer
training for school staff and parents, giving administrative support, managing
finances, preparing budgets and undertaking curriculum development at the school
and state level, did in fact match in part with EDWA's list of duties. This study
will determine the current duties that take up much of a Computing Coordinator's
time.

As Kershaw and Weber (1991) succinctly put it, Computing Coordinators'
roles are determined by the demands that "stem from the needs of the various
people groups and tasks related to the technological needs of the computing
environment" (p. 101). These demands can, and do, occur at any time and
Computing Coordinators feel obligated to respond, even with enthusiasm, "despite
relentless long days and a general lack of support", as 666 coordinators were
reported to be doing in the American survey performed by Bruder (1990, p. 24). It
would appear that Computing Coordinators involved in the Kershaw and Weber (1991), Bruder (1990) and Barbour’s (1986) studies, performed a range of tasks necessary for the efficient application of computer technology within their respective schools, whether expected or self perceived.

Training and Professional Development

Kershaw and Weber (1991) considered there was a need to “investigate and make decisions about what qualifications a good Computing Coordinator should hold” (p. 106). In their study they found that approximately 17% of coordinators had no formal qualifications in computing, the remainder having completed graduate or postgraduate degrees in computer education or computer science after their initial teacher training in either mathematics or science. This study will also determine the current level of qualifications in computing held by Computing Coordinators.

Over 80% of Australian school coordinators in Kershaw and Weber’s (1991) study considered they received less than adequate professional development support in computing for their needs. Within the government school system alone, 63% felt they were given no professional development support in computing. Only 7% of Computing Coordinators in the public schooling system considered the level of professional development support to be adequate compared to 42% of private school coordinators. The time frame in Kershaw and Weber’s (1991) study for the number of hours that Computing Coordinators spent on
professional development, is unclear. However, as shown in Figure 1, 64% of coordinators from the private schooling system spent more than 60 hours on in-service in comparison to their government counterparts where the figure was only 36%. Of those who spent less than 10 hours, 72% came from government schools.

![Figure 1](image-url)

Figure 1. Professional development completed by Computing Coordinators in Kershaw and Weber's (1991) study.

During 1996, a Government School Teachers' Enterprise Agreement was developed between the following three parties: The Education Department of Western Australia, The Australian Education Union and The State School Teachers' Union of Western Australia Inc. This agreement was part of a nationwide initiative that required increased productivity for increased pay. The two year enterprise agreement (1996-1997) contained 24 clauses pertaining to the staff employed under the Western Australian Education Act, but excluding many school administrators, including Principals and Heads of Departments. One of these clauses involved an expectation that teachers in Western Australian schools complete 20 hours professional development during 1996 and 30 hours during 1997, half of which may be undertaken during school time provided that:
• it is primarily on School Development and Planning Days;
• it minimises the disruption to students' instructional programs; and
• it should not require any enhancement of the teacher relief component of the School Development Grant.

The agreement enumerates a considerable number of conditions relating to the 'when', 'type' and the 'monitoring' of the professional development to be undertaken (Government School Enterprise Agreement, 1996). While the professional development of teachers is expected to incorporate activities aimed at improving student learning, essentially, it would require the approval of Principals at individual schools. Therefore, what teachers consider to be acceptable professional development in relation to the agreement, may not be considered so by Principals or if they are, resources may not be available to support further inservice courses. Although Kershaw and Weber's (1991) study took place in 1991, well before this agreement was in operation, it is likely that coordinators completed many more hours per year on inservice courses in areas considered to be priorities by individual schools.

Whilst Western Australian school teachers were obliged to complete the 20 hours of professional development in 1996 and the 30 hours in 1997 in an area considered to be a school priority, as would be expected, no restrictions were placed on a teacher completing many more hours per year. However, it must be remembered that only half of the agreed hours for professional development can be taken in school time, the remainder to be completed in a teacher's own time.
and when funds do not allow, at their own expense. Perhaps this could account for Kershaw and Weber's (1991) "expected" result of coordinators completing the majority of their professional development in computing "in their own time" and although not stated, it is likely to have been at their own expense (p.104).

Teaching and Time

In relation to a coordinator's teaching duties, Kershaw and Weber's (1991) study determined that 10% of coordinators had relatively full teaching loads and of those, 40% had no time allocation for "duties related to teaching computing" (p.104). A further 44% had less than one day per week for teaching related duties. A personal contact with Kershaw during 1996 was unable to uncover further information relating to the reason why such a large proportion of Computing Coordinators in Kershaw and Weber's (1991) study had minimal or no time allocation for their teaching related duties. Also, as both government and non-government high school teachers are automatically allocated 'Duties other than Teaching Time' (DOTT), it is unclear why the 40% of coordinators with full or almost full teaching loads reportedly received no DOTT.

It is interesting to note that in both Bruder's (1990) and Barbour's (1986) studies the majority of coordinators also taught in addition to performing their coordinating responsibilities. Again, as with Kershaw and Weber's (1991) study, no statistics were given to evaluate how much time was allocated for their duties other than teaching. However, Barbour (1986) reported that 80% of Computing
Coordinators considered their departmental duties to be “part-time or an additional responsibility” (p. 36).

It was impossible to determine from the previous studies by Kershaw and Weber (1991), Bruder (1990) and Barbour (1986), how much time, if any, was specifically allocated to Computing Coordinators to perform their coordinating roles or the time consuming nature of individual tasks. This study set out to collect data to provide a clearer indication of the actual time allocated to coordinators for teaching, teaching preparation (DOTT), Head of Department and their extended role of Computing Coordinator, along with a breakdown of their most time consuming duties.

Computing Equipment

Hardware maintenance was ranked as the upper-most duty performed by Computing Coordinators in Kershaw and Weber’s (1991) Australian study and fourth in Bruder’s (1990) American high school study. According to Kershaw and Weber (1991), over 90% of coordinators in their study were totally responsible for the maintenance of computer equipment in their schools, although no mention was made of them having technical qualifications.

The time consuming nature of hardware maintenance is hardly surprising according to Coburn, Kelman, Roberts, Snyder, Watt and Weiner (1985), who consider that computing equipment is “not built for constant use by hundreds of
different people with varied understanding of how they work" (p. 244). Consequently, at the school level, malfunctioning equipment is often a daily occurrence. Whilst further study would be necessary to verify the age of computer equipment in Australian high schools, from personal experience at six government senior high schools in Western Australia during the nineties, a good proportion of computer equipment was found to be from that era. In fact, this is the first year (1997) that I have had computer equipment, available for student use, capable of running GUI software.

Factors that could have an influence on coordinators' ranking of hardware maintenance is the number, type condition and location of the equipment. Although Kershaw and Weber (1991) made no mention of the condition of the equipment in the care of coordinators, they did find that 16% of schools had in excess of 60 computers of varying brands, which were scattered between one and four locations. From these findings, it would seem inevitable that managing computer equipment would take a high priority.

Conclusions

The study performed by Kershaw and Weber (1991) projected the view that coordinators were overloaded with a multitude of duties with little time in which to do them. It is hoped that as teachers gain confidence in the use of technology and moves to integrate computers across all curriculum areas increases, some of the responsibilities previously placed on coordinators will shift.
There would appear to be a consensus between the limited American and Australian studies that hardware maintenance is taking up a good proportion of a coordinator’s time. This could be due to increased technology within schools, the type and condition of the equipment, and the spread of technology within individual schools. Approximately ten years ago, Smith (1987) wrote in recognition of the demands placed on coordinators that “schools must begin to employ teacher aides for the computer departments as the job specification of computer coordinators is becoming far too broad and unwieldy” (p. 142). Based on Kershaw and Weber’s (1991) findings, these demands on coordinators are escalating in Australian high schools.

Very few of the coordinators in Kershaw and Weber’s (1991) study were found to have no computing qualifications, the majority having gained these qualifications since becoming teachers. This study will provide updated figures on Computing Coordinators’ level of qualifications in computing.

Kershaw and Weber’s (1991) study highlighted the inequalities between government and non-government high schools provision for professional development of Computing Coordinators. This study will clarify how much time Computing Coordinators at Western Australian government high schools spend on formal professional development in computing per year.
Chapter 3

Method

This chapter outlines the method used, defines the sample, describes the instrument and provides a rationale for the use of a census survey in this study.

Method and Survey Sample

Due to the nature of this research and the relatively small target group of eighty five schools, a written census survey of all Western Australian government senior high school Computing Coordinators was seen as the most appropriate option. Interviews were not considered as this would have necessitated a smaller sample, due to time and travel constraints, which would possibly reduce the value of the results. All Australian states were not included as the data may have proved to be ambiguous due to conflicting state policies. For similar reasons, non-government schools were also omitted from this study.

Computing Coordinators from the eighty five government senior high schools in the state of Western Australia, with the agreement of their respective Principals, were asked to take part in this survey. Both Computing Coordinators and Principals were advised of the scope and purpose of the study and assured of anonymity. Coordinators were also asked to complete a consent/response slip to enable follow-up of late respondents. A second letter and questionnaire were forwarded to non-respondents approximately eight weeks after the original (Appendix B).
The Questionnaire

The survey questionnaire used in this study was based on Kershaw and Weber's (1991) "Survey of Senior Computing Teachers" (p.109). Kershaw and Weber's (1991) five part questionnaire, consisting of fifty questions, was revised to take into consideration the different sample groups and aims of the two studies. Twenty one questions were deleted from Kershaw and Weber's (1991) original questionnaire, three of which were irrelevant to a statewide study of government schools and a further three were found to be unsuitable after the pilot study for this current research. The remaining fifteen questions were removed for various reasons. For example, Kershaw and Weber's (1991) survey questionnaire requested the age of coordinators, hours used to prepare lessons using a computer, time spent using computers prior to teaching computing subjects and questions relating to coordinators seeking and applying for other positions within and external to teaching. These questions did not meet the needs of this current study.

Minor alterations were made to six questions from Kershaw and Weber's (1991) questionnaire to add clarity for this current study. For example, the average number of hours per year a coordinator spends on professional development in computing was requested on the revised questionnaire. Kershaw and Weber's (1991) questionnaire did not provide a time frame for the professional development undertaken. Also, Kershaw and Weber's (1991) study asked if Computing Coordinators were members of "a local State Computer Education Group" (p. 109). This was revised to read, "Are you a member of a recognised
technology group or association?" (Appendix A, Question 13), terms more suited to the sample involved in this current study.

Eight questions were added to the revised questionnaire. These questions related to the number of hours per week coordinators taught, hours allocated to perform their coordinating duties, time spent on informal training relating to computers in the school, the number of years they had been performing coordinating duties and whether or not they considered their coordinating duties impinged on their role as a teacher. Coordinators were also asked to provide information on the condition and suitability of the hardware and software available in their schools and give details relating to the leasing of computer hardware. These additional questions were necessary to more fully address the research question. In addition, coordinators were asked to make an extended response on the revised questionnaire. The purpose of the extended response was to give coordinators the opportunity to clarify their situation and to provide possible solutions to any problems they may have been experiencing. This option was not available on Kershaw and Weber's (1991) original questionnaire.

The revised questionnaire resulted in thirty questions, made up of the following six sections (Appendix A):
• Part A - Background and Training
• Part B - Professional Development
• Part C - Teaching Time
• Part D - Coordinator Duties
• Part E - Coordinators' Perceptions
• Part F - Coordinators' Responses

Table 1 outlines the relationships between the sections of the questionnaire and the subsidiary questions, to the main research question listed in Chapter 1.

Table 1

Relationship Between the Subsidiary Questions and the Survey Questionnaire

<table>
<thead>
<tr>
<th>Subsidiary question</th>
<th>A</th>
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<th>C</th>
<th>D</th>
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<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Aim of the Questionnaire

The questionnaire used in this study aimed to provide information to develop a profile of the background, current role and perceptions of Computing Coordinators in Western Australian senior high schools.
The time coordinators spent performing the various groups of duties, such as teaching, teaching preparation, departmental and the coordination of computing within the school, were requested. Details of the duties performed by Computing Coordinators enabled comparisons with Kershaw and Weber's (1991) study and a breakdown of the most time consuming duties should provide valuable data for forward planning.

The questionnaire allowed for data to be collected on Computing Coordinators' perceptions of their current roles. Coordinators were also given the opportunity to make a brief statement with regard to any major problems they were experiencing in their position and to offer their own solutions. The purpose of collecting the open response data was to provide a clearer insight into how Computing Coordinators were coping with their roles as coordinators.

Pilot Study

Due to the changes made to the original questionnaire developed by Kershaw and Weber (1991) and for the purpose of testing its reliability, nine Computing Coordinators from private non-government high schools were asked to take part in a pilot study. Six schools responded by returning a completed questionnaire.
Using the responses from the pilot study, the instrument was revised to improve the wording of the questions, ease of completion and data analysis. For example, Kershaw and Weber's (1991) questionnaire and that used in the pilot study asked respondents to answer separately how many non-teaching hours they were allocated for duties 'related' to and 'not related' to computers. Computing Coordinators in the pilot survey for this study found these questions confusing as they indicated they were only given one allocation of time for both sets of tasks. Therefore, the two questions were rewritten as one to include all duties external to teaching and DOTT (Appendix A, Question 17) and the separate section for questions relating to "In Charge Duties" was amalgamated in "Part D - Coordinator Duties" in the revised questionnaire. Both Kershaw and Weber's (1991) questionnaire and that used in the pilot survey also requested the number of peripherals and the different brands of computers that coordinators were responsible for. The pilot study for this current research returned estimated numbers of peripherals or no number at all and unclear answers for the brands of computers. Therefore, these questions were omitted. The final questionnaire did request the number of operating systems coordinators work with, providing more relevance than the 'brands of computers' question as the number of operating systems would be expected to have a greater impact on the time coordinators required to manage the systems. Coordinators in the pilot study also had difficulty in ranking a predefined list of duties in order of their time consuming nature and found it necessary to add many duties of their own. Using the most common
responses made by coordinators in the pilot survey the list was redefined for the final questionnaire used in this study.

Method of Analysis

The majority of the data from the questionnaires used in this study were entered into a computer spreadsheet. Most questions required a closed response using either a numeric scale, or a set of alternative responses were given a numeric code prior to data entry. This allowed for frequency counts to be represented as a percentage of the group. The series of attitude statements were rated on a five point Likert scale, ranging from strongly agree to strongly disagree. However, there was no attempt to link the attitude statement together to form a scale.

A coding frame was devised for the open ended questions to classify the frequency of like responses. The coding frame consisted of a two column table prepared in a word processor. Using the open responses made on the first questionnaire to be recorded, a one was entered in the cell of the first column in the table and the nature of the response in the corresponding cell. This continued until all of the individual responses from the first questionnaire were entered in the table. As like responses were found on the remaining questionnaires, the number in the first column was incremented. As new responses were found, these were added to the table. This continued until all possible responses were added to the table and the corresponding number column increased to cater for all like
responses. This procedure made it possible to calculate the number of like responses.

Where possible, the results from this study were discussed with reference to those of Kershaw and Weber (1991). This was particularly the case in the areas of qualifications, professional development, teaching time and coordinating duties.

Conclusion

This study took the form of a census survey of Computing Coordinators at Western Australian government senior high schools. Although the survey questionnaire was based on Kershaw and Weber’s (1991) original instrument, the final questionnaire used in this study was rewritten to specifically target Computing Coordinators at Western Australian government senior high schools. Whilst many changes were made to Kershaw and Weber’s (1991) original instrument, the intention and purpose of their questionnaire and that used in this current study remained unaltered. Both questionnaires set out to determine the full nature and extent of the duties performed by Computing Coordinators.

The pilot survey for this study highlighted the necessary changes to be made to the questionnaire. The changes were made to ensure consistency of responses from the target group and, in turn, improve the reliability and validity of the survey instrument. Whilst interviewing Computing Coordinators may have
offered greater validity to the data collected, a degree of triangulation was achieved by giving coordinators the opportunity to make a brief statement in addition to the closed response questions contained in the questionnaire. The extended responses made by Computing Coordinators in the pilot study invariably reflected their closed responses.

The final questionnaire was linked to the research questions and this will be demonstrated more clearly in the results and discussion chapters of this report.

Computer software was used to calculate and determine the results which are contained in the following chapter.
Chapter 4

Results

The results of this study address the research question, "Do Computing Coordinators at West Australian government senior high schools have adequate support to perform their duties?" The first section of this chapter states the procedures used and the responses made by coordinators to the questionnaire and the final section summarises the results. The sections between follow the outline of the survey questionnaire (Appendix A) by stating and discussing the related subsidiary questions. The relationship between the results and the questions will be considered in detail in the discussion chapter.

Survey Responses

At the time this study commenced there were eighty five government senior high schools in Western Australia. Computing Coordinators at these schools were asked to take part in a census survey relating to the nature of their current roles, by completing a three page questionnaire. Within one month, 46 Computing Coordinators had completed and returned the questionnaire. After a follow-up reminder, only 4 further completed questionnaires were received. A total of 50 Computing Coordinators chose to participate, 59% of the original sample. This good participation rate increases the generalisability of the findings.

Computing Coordinators were requested to complete and return a slip consenting to the use of their responses in this study. Eleven of the fifty
respondents did not complete the slip of consent. However, completion of the questionnaire was seen as their agreement to take part in the survey (Appendix B).

Part A - Background and Training

The results relating to the background and training undertaken by Computing Coordinators assisted in addressing subsidiary question three, “Does a Computing Coordinator hold formal qualifications in computing?”

Of the fifty Computing Coordinators who responded to this survey, 72% were male, 24% female and 4% did not address this question. Most (78%) Computing Coordinators were found to have formal computing qualifications, the majority holding either a Graduate Diploma in Applied Science or a Bachelor of Education in Computing. Australian university students enrolled in teaching degrees may choose to select a major and a minor area of specialisation. The coordinators found to have formal computing qualifications were made up of 61% holding a major and 17% a minor. The coordinators without computing as their major teaching area had gained their major qualification in a wide range of curriculum areas (see Figure 2). Of the 88% of coordinators found to have a minor area of specialisation, Figure 3 shows that most were in the Faculties of mathematics, computing, science and business.
Figure 2. Computing Coordinators' major teaching specialisation.

Figure 3. Computing Coordinators' second specialisation area.
Eleven (22%) Computing Coordinators indicated they had no formal computer related qualifications. Nine of the eleven coordinators without formal computing qualifications considered their computing skills to be at an average to high level and the remaining two of a very high level (see Figure 4). All of the coordinators without formal computing qualifications indicated that they had developed their computing skills by teaching themselves on the job. However, of the eight (16%) coordinators who were enrolled in formal computer related studies, the majority in multi-media, six were from the group of eleven that had no former computing qualifications. Of these six coordinators, two considered their level of computing skills to be high, the remaining four at an average level.

In addition to coordinators' training and qualifications in computing, all respondents had been using computers in excess of three years. Furthermore,
almost 20% had been Computing Coordinators in excess of ten years with a mean of six years.

Part A - Conclusion. Most Computing Coordinators held formal computing qualifications or were in the process of attaining formal degrees in computing. The few coordinators without formal computing qualifications considered their skills in computing to be average to above average.

Part B - Professional Development

The extent of professional support afforded to Computing Coordinators and the amount of professional development undertaken directly impacts on the subsidiary question, "What support is offered to Computing Coordinators in the performance of their duties?"

Only 6% of Computing Coordinators indicated that the level of school professional development support in computing was adequate, with none finding it more than adequate. Almost one third (30%) of coordinators considered that no support was available in any form (e.g., time off or payment of course fees) for professional development in computing. As shown in Figure 5, a further 64% felt the level of professional development support was inadequate or barely adequate.
Figure 5. Computing Coordinators' opinions of school level of support for professional development in computing.

Whilst the majority of respondents found the level of professional development support lacking, Figure 6 shows that 28% did attend inservice courses for more than 21 hours per year, a further 64% spending up to and including 20 hours a year and the remaining 8% completed none.

Figure 6. Hours spent by Computing Coordinators on inservice courses per year.
In addition to formal professional development, Computing Coordinators in this study spent an average of seven hours per week on informal self training in computing, with 26% spending in excess of ten hours per week.

A relatively small proportion (16%), of Computing Coordinators were involved in curriculum development or syllabus committees. Just 20% were part of a formal network of computing teachers, meeting once or twice per year. Additionally, only 28% of respondents were members of recognised technology groups or associations. Again, of this 28%, the majority met just once or twice a year and one coordinator never attended meetings.

**Part B - Conclusion.** Most Computing Coordinators found the level of professional development support in computing inadequate with the majority spending less than 20 hours per year on professional development in computing.

It would seem clear that the lack of professional development support experienced by coordinators could influence the time they took to perform their coordinating duties. As will be explained in other sections of this chapter, many of the tasks undertaken by Computing Coordinators require exacting professional development or training if they are to be performed efficiently.
Part C - Teaching Time

The results contained in this section, are used to address the subsidiary questions, “What other roles do Computing Coordinators undertake within the school?” and “Do coordinating duties impinge on other roles?”

Computing Coordinators involved in this study were found to teach an average of 19 hours per week with 88% teaching in excess of 16 hours per week in the area of computing. However, 80% of coordinators indicated that they spent a proportion of their teaching time managing computers, 18% used none and 2% did not address this question. For these coordinators, four hours per week was the average number of actual classroom teaching hours they used to manage computers, 37.5% used five or more hours, 15% used eight or more hours and one coordinator spent fifteen hours per week teaching time managing computers (see Figure 7).

![Figure 7. Number of teaching hours per week Computing Coordinators spent managing computers.](image)
Directly linked to teaching time is the number of hours allocated to teachers for duties other than teaching (DOTT). Computing Coordinators indicated that they were allocated an average of five hours per week for DOTT, which is normal DOTT for a full-time secondary teacher. As shown in Figure 8, 92% of coordinators responded that they spent varying amounts of their DOTT managing computers, the remainder used none. An average of three hours per week of coordinators' DOTT was spent managing computer systems, with 58% using three or more hours and 17% using all of their DOTT.

![Figure 8. Number of teaching preparation (DOTT) hours per week Computing Coordinators spent on managing computers.](image)

Consistent with the high proportion of Computing Coordinators spending some of their teaching time and some of their DOTT managing computer systems, 88% of respondents considered that their role as Computing Coordinator seriously impinged on their role as a teacher. Of these, 77% held computing qualifications, 23% were without formal computing qualifications which is consistent with the
proportion of computer qualified to unqualified coordinators across the entire sample.

Part C - Conclusion. The results found that Computing Coordinators had relatively full teaching loads with most using a considerable amount of their teaching time and DOTT to manage computers. Only 10% of Computing Coordinators considered that their coordinating role did not affect their teaching role with a further 2% not addressing this question.

Part D - Coordinator Duties

Due to the varied aspects of a Computing Coordinator's duties, this section has been divided into the following sub-sections: 'Time for coordination of computing and departmental duties', 'Computer coordination responsibilities', and 'Extent of responsibilities and time'. The results from these sub-sections will be used to address the subsidiary questions, "What is the nature and extent of Computing Coordinators' Duties?", "What other roles do Computing Coordinators undertake within the school?" and "What support is offered to Computing Coordinators in the performance of their duties?"

Time for coordination of computing and departmental duties. Thirty-Six (72%) of the fifty Computing Coordinators in this study were found to have the added responsibility of departmental duties. Of coordinators with departmental duties, thirteen (36%) had no time allocated to perform their departmental or
computer coordinating duties, the remaining 23 (64%) were allocated an average of 4 hours per week. Those coordinators with departmental and the coordination of computing duties who had no time allocation for the performance of these duties, taught an average of 20 hours per week (see Figure 9). However, one coordinator only taught 16 hours per week and had a normal DOTT allowance (5 hours) and another coordinator taught 18 hours per week but had 8 hours allocated for teaching preparation (DOTT).

![Figure 9](image)

Figure 9. Number of hours the 36% of Computing Coordinators with departmental duties teach in addition to performing departmental and coordinating duties without a time allocation.

Of the remaining fourteen (28%) Computing Coordinators who did not have departmental responsibilities, five had no time allocation for their duties external to teaching and teaching preparation. Of these five coordinators, one had reduced teaching hours (16 hours per week) due to other responsibilities within the school and another taught part-time (6 hours per week). The remaining three coordinators without departmental duties and no time to perform their coordinating duties, taught an average of 20 hours per week.
Of the Computing Coordinators who were found to have departmental duties, 69% were in charge of one department, 28% in charge of two departments and 3% were responsible for three departments (see Figure 10). The larger proportion (58%) of Computing Coordinators who had departmental responsibilities liaised with three or more staff in this capacity.

![Figure 10. Number of departments that Computing Coordinators are responsible for.](image)

Time to perform both their departmental role (if they had one) and computer coordinating duties was awarded to 64% of Computing Coordinators with an overall average of four hours per week. Figure 11 provides a more detailed summary of the time allocated to Computing Coordinators to perform these duties.
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to perform their computer coordination duties, with an average of three and a half hours, the remaining five (10%) coordinators received none.

Therefore, only the four (8%) Computing Coordinators with departmental duties and greater than five hours time allocation to perform their duties external to teaching, DOTT and departmental responsibilities, and the nine (18%) Computing Coordinators without departmental duties, actually received time to perform their coordinating duties. This results in thirteen (26%) Computing Coordinators being specifically allocated time, an average of three and a half hours per week, to carry out their coordination of computing duties, thirty-seven (74%) receiving no time.

Computing Coordinators estimated that an average of eight hours per week would be needed to efficiently perform their coordinating duties, although 34% indicated that in excess of ten hours per week would be required (see Figure 12). 71% of Computing Coordinators without departmental duties and 50% of those with, felt that a minimum of five hours were required to perform their coordination of computing duties efficiently.
Figure 12. Average number of hours Computing Coordinators estimated were required to efficiently perform their departmental and coordination of computing duties.

There were some discrepancies between the time coordinators estimated they needed to efficiently perform their duties and the time they were already using. For example, one Computing Coordinator, who had a full teaching load in computing, used two hours per week of teaching time and all DOTT time to manage computers, had no formal qualification, maintained 80 stand-alone computers and had departmental duties, estimated that only one hour per week was needed to efficiently perform all the required duties. Another respondent with a full teaching load and in charge of two departments received and considered that no time was required to fulfil these extra duties, yet three hours per week of
teaching time and two hours of teaching preparation time were spent managing computers.

Computing Coordinators receiving a payment for their duties external to teaching and teaching preparation were evenly distributed between those with departmental duties and those without. A total of 46% earned a remuneration for their coordinating roles.

**Computer coordination responsibilities.** Table 2 summarises what the Computing Coordinators ranked as the five most time consuming tasks they performed. The questionnaire listed the first eleven tasks as quoted in Table 2 and allowed respondents to add others as they thought necessary. Coordinators added a total of eight other duties, e.g., Year Coordinator, TAFE support, furniture maintenance, etc., but apart from the 'Filling out Surveys' response which was given a ranking of one, all were given a less time consuming ranking. Of the first eleven items listed, 90% of coordinators who responded performed all the tasks using varying degrees of time.
Table 2

Computing Coordinators’ Ranked Responses to their Five Most Time Consuming Tasks, Ranked by Number

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Ranked responses</th>
<th>% ranking in top five</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
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<tr>
<td>Maintain Software</td>
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<td>Reports/Budgets</td>
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<tr>
<td>Evaluate Hardware</td>
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<td>1</td>
</tr>
<tr>
<td>Filling out Surveys</td>
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</tbody>
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NOTE. 1 ranked most time consuming

* Responses to this question equalled 48 out of a possible 50.
Maintaining software was ranked by 92% of Computing Coordinators as one of their top five most time consuming tasks with 34% ranking it as the duty that used up most of their time and a further 31% as their second. As opposed to software installation which was ranked in the top five by 60% of respondents (see Table 2), software maintenance refers to tasks such as the restoration of corrupt software, virus scanning and removal, recovery of lost files and the setting up of drivers for new peripherals devices. Whilst some tasks in this category may link with software installation, they differ in that they are not aligned to the initial installation but are ongoing tasks needed to enable the software to run efficiently. Computer Coordinators can, and occasionally do, call on specialists to rectify more complicated software problems. As software specialist are very expensive and costs are paid out of school maintenance grants or individual faculty funds, pressure is placed on coordinators to fix the problems.

It was likely that some of the time coordinators spent on software maintenance was related to the low level of networking evident and the range of operating systems used in many schools. Only 16% of schools had all of their computer systems networked. A further 20% of the schools surveyed had stand-alone systems and the remaining 64% had a mixture of networked and stand-alone systems, directly in the care of Computing Coordinators. Software maintenance is considerably reduced with networked systems as many computers are linked to one or more central computers or servers that basically store most of the software. Further to the networking configuration of computer systems is the operating
platforms they support. 58% of Computing Coordinators indicated that they worked with three or more operating systems, 18% working with four or more. Only 16% of coordinators worked with one operating system. The more operating system environments that coordinators work in, the greater their knowledge and skills base needs to be to handle the idiosyncrasies of individual systems software.

Hardware maintenance was the second highest consumer of time with 83% of Computing Coordinators ranking it in their top five most time consuming tasks, 60% rating it in the top two (see Table 2). Coordinators were responsible for an average of 72 computers, ranging from a minimum of 20 to a maximum of 170, with 20% having in excess of 100 computers to maintain (see Figure 13).

Figure 13. Number of computers in the care of the 50 Computing Coordinators involved in this study.
Figure 14 reports the percentage of hardware that Computing Coordinators considered to be outdated in relation to continual malfunctioning. Over three quarters of coordinators felt that up to 30% of their computer equipment required continuous maintenance, the remainder indicated that between 30% and 50% of their computer equipment regularly malfunctioned. None of the Computing Coordinators in this study indicated that greater than 50% of hardware equipment was outdated due to continual malfunctioning.

![Bar chart showing percentage of malfunctioning hardware](image)

Figure 14. Percentage of hardware considered to be outdated in relation to continual malfunctioning.

Clearly, Computing Coordinators had a large amount of hardware to maintain with little support with 84% of them not having access to a computer technician or assistant. Of the remaining 16% (8 schools), 50% had access on call, 38% for one day per week and the remaining 13% for two days per week. However, 58% of the schools surveyed were leasing at least some computer
equipment, with a further 32% considering this option. Of the four (50%) schools that had access to a computer technician on call, three were found to be leasing computer hardware. Leasing does provide some benefits, such as warranties, repairs and replacement once outdated.

This study found that 90% of Computing Coordinators attended to the technical problems associated with hardware and software computer maintenance. However, 91% of coordinators considered they had no qualifications in the area of technical maintenance of computer equipment and the tasks they performed were not in their job specifications.

As shown in Table 2, other areas that took up much of a Computing Coordinator’s time were the installation of software (60%) and assisting other staff (58%), each ranked by a high percentage of coordinators in the top five most time consuming tasks. However, only three out of a possible forty eight coordinators ranked installing software as their most time consuming duty with a further three rating it as their second. Assisting staff members rated higher with four coordinators giving it a rating of one and seven a rank of two. The latter amounting to a total of eleven coordinators out of the forty eight, approximately 23%, who responded in comparison to the six (12.5%) who ranked installing software in the top two.
As with assisting other staff, "departmental duties" was also ranked by eleven (23%) Computing Coordinators in the top two most time consuming tasks, although only 42% of coordinators ranked this task in the top five.

To clarify the situation further, Figure 15 shows the percentage of coordinators that ranked each of the five predominant tasks as their first and second most time consuming duty. An issue that needs to be looked at more closely is that double the number of coordinators gave software maintenance a ranking of one in comparison to those who responded to performing departmental duties, and this figure over quintupled when compared to the second ranking (see Table 2). The number of Computing Coordinators who ranked hardware maintenance in the top two most time consuming duties were also considerably larger than the coordinators who ranked departmental duties similarly. It is necessary to keep in mind here that HODs are automatically awarded time to complete their duties whereas Computing Coordinators are only allocated time if a school's administration sees fit to award it.

![Figure 15](image)

Figure 15. Percentage of Computing Coordinators that ranked duty as first and second most time consuming duty.
Extent of responsibilities and time. Computing Coordinators in schools that had a large number of computers tended to be given some time to attend to their coordinating tasks. On average, an additional one hour per week was allocated to the 20% of coordinators who were responsible for greater than 100 computers, although the mode and median remained at four hours. A further one hour per week, an increase to an average of six hours, was awarded to the 10% of coordinators who had departmental duties in addition to a minimum of 100 computers to care for. Again the mode and median were unchanged. Both groups estimated that they required an average of ten hours per week to perform their computer coordination roles, as clearly the time given was inadequate.

Part D - Conclusion. Besides having an almost full teaching load, most coordinators were found to be responsible for up to three departments. Although over half of the coordinators in this study were allocated a small amount of time to perform their duties, it appeared that this time was for their departmental duties rather than for the coordination of computing. This would appear to be inconsistent as coordinators ranked departmental duties fifth in their list of time consuming duties.

Computing Coordinators ranked software and hardware maintenance, installing software, assisting staff and departmental duties, respectively, as their five most time consuming duties. The time consuming nature of the first four
duties were not surprising as schools had an average of 72 computers with one fifth having over 100 computers directly in the care of Computing Coordinators.

Although coordinators estimated they needed an average of eight hours per week to perform their coordinating role, they were given minimal support in the form of time or assistance with the majority not receiving time to perform their coordinating role and most not having access to a computer technician.

Part E - Coordinators' Perceptions

The purpose of this section is to gain a greater understanding of how coordinators perceive their role. To achieve this, coordinators were asked to respond to a series of statements, each using a five point Likert scale. The Cronbach-Alpha reliability coefficient for the question of perceptions was 0.997.

Due to the nature of coordinators' perceptions, the results cannot be presented in isolation. A degree of discussion and reference to other results in this chapter is necessary to more fully address the subsidiary questions, "Do coordinating duties impinge on other roles?" and "What are the perceptions of Computing Coordinators towards their coordinating roles?"

This study was not able to establish the precise number of hours Computing Coordinators spent performing their coordinating duties. However, it was determined that many coordinators were utilising a proportion of their
teaching and teaching preparation time and, of course, any time that was specifically awarded to them to carry out their coordinating roles. Other time, for example before or after school, may or may not have been used but this information was not collected. Coordinators did consider that they needed an average of eight hours per week to carry out their computer coordinating tasks, however, ten hours were required by coordinators with departmental duties and greater than 100 computers in their care. With this in mind, well over 70% of coordinators disagreed to strongly disagreed with the statement that they were given ample time to perform their coordination of computing duties or, in fact, all of their roles. Further, 62% agreed, to strongly agreed that a school’s expectations of Computing Coordinators was unrealistic. There were minimal disagreements with this statement (18%), and 20% remained neutral.

Only 16% of the respondents in this study considered that school principals understood the duties required of Computing Coordinators and yet 40% agreed that they had a high profile at their school with 20% strongly agreeing to this statement. This high profile may be a by-product of their willingness to take on more than is actually required of them in their coordinating roles, as 78% of coordinators perceived they were doing.

Coordinators were almost unanimous in their agreement that they enjoy using computers. Perhaps that is why they continue to perform all the duties necessary for the smooth running of technology in their schools, especially in
relation to hardware maintenance where only 20% of coordinators considered that getting computer equipment repaired was easy.

It has already been determined that the majority of the Computing Coordinators in this study had gained formal computing qualifications. They also spent considerable time updating these skills through formal and informal means and would have gained further skills during the performance of their duties. Having gained all these qualifications and skills, coordinators are probably aware of their job prospects outside of educational institutions. They would notice the available computer-related professional employment columns in newspapers. As technology has accelerated within the business sector, so has the need for professional personnel to look after this technology. Perhaps this is why almost three quarters of the Computing Coordinators in this study felt that there were more rewarding job opportunities in computing outside of schools, and 44% had recently considered applying for them.

Part E - Conclusion. It was the perception of most coordinators that they were hard-pressed to meet the demands of their coordinating role. In their endeavour to perform the host of coordinating tasks expected of them, both teaching time and DOTT were being gobbled up.
Possible due to the frustrations experienced by coordinators in an effort to cope with the pressures of their coordinating role, a number had considered applying for positions outside of schooling.

Part F - Coordinators' Responses

Computing Coordinators involved in this study were requested to write a brief statement to discuss any major problems they were experiencing in their current roles and offer some solutions to these problems. The solutions offered by coordinators will be outlined in Chapter 5. However, this section discusses Computing Coordinators' concerns with regard to their coordination role. Again, it is necessary to discuss and refer to results from other sections of this chapter in order to clarify the major concerns of Computing Coordinators and to further address the subsidiary questions, "What other roles do Computing Coordinators undertake within the school?" and "What are the perceptions of Computing Coordinators towards their coordinating roles".

Apart from completing the set questions on the questionnaires, ten (20%) Computing Coordinators provided extended responses outlining their current concerns and possible solutions, in place of the brief statement requested. Both the brief and extended responses were placed in a coding frame to collate like responses.
By far the major issue referred to by twenty-three (46%) Computing Coordinators in their open ended responses was that relating to time, especially from coordinators with departmental roles, the responsibility of over 100 workstations and collaboration with many staff members. This factor was even mentioned by coordinators who already received an award of time equal to that given to a HOD (20% of a full teaching load or approximately five hours). The main difficulty that coordinators referred to was trying to balance their teaching obligations with that of their coordinating role.

Another major issue expressed by coordinators and closely connected to time allocations was the expectations placed on them by their peers. Eleven (22%) Computing Coordinators specifically mentioned the pressures associated with being required to assist staff with a host of daily computer related problems. Many felt that they were at the beck and call of all school staff, often in excess of 80 personnel, who assumed that because Computing Coordinators teach computing, they were not only capable but expected to assist them with any information technology queries. Some of these expectations required that coordinators had extensive expertise in: multiple hardware systems and related technical issues, advanced knowledge of all software including those just released, communications - networking, Internet, various programming languages, and all aspects of multimedia. Further, a number of coordinators considered that they were under pressure to troubleshoot these problems and fix them immediately, regardless of whether they were teaching, on teaching preparation time or at lunch.
This situation seems over ambitious since each of these areas of expertise require many units of study at university to master.

Another concern mentioned by eight (16%) Computing Coordinators was the number of computer system failures believed to be caused by untrained staff. These coordinators referred to their frustration with staff who had little or no computing skills, did nothing to rectify this situation and continually called on them for assistance. It would appear that slowly but surely computers are being integrated into many curriculum areas. Whilst there are obvious benefits attached to this trend, the teachers involved do require basic computing skills. According to some coordinators, unskilled staff utilising computer technology often leads to incorrect use of equipment and student tampering, resulting in computer downtime. One coordinator also felt that when teachers lacked skills and motivation in computing technologies, it invariably led to a reduction of student enthusiasm resulting in disinterested students in developing further use of the computer as a tool.

The rapid change in new hardware and software was also given as a problem with 26% of Computing Coordinators considering that ongoing training in computer technologies was essential. Coordinators indicated that in order to continue to perform all of the duties expected of them and have the necessary skills to allow students to make efficient use of technology, professional development support in the form of time and funds were required.
To conclude this discussion, the following quotes were selected from coordinators' responses to provide a broad picture of their feelings and an outlet for some more poignant statements made by Computing Coordinators:

Wasting half my teaching time (I have a full teaching load) on solving technical problems is a joke.

..... all Computing Coordinators should work to rule for a few months. The resulting chaos would force attention to the issue.

To be honest, I have had it completely - I am only appreciated for my technical ability - and only monkey work for peanuts!

There is continual disruption to teaching due to equipment failures.

If it wasn't for our interest and dedication to the area, the three computer rooms, which are basically used full time for computer studies, would not function as well as they do.

And finally, one Computing Coordinator added after writing lengthy remarks relating to the current situation coordinators found themselves in, "I do not want the above to be seen as a grievance but rather a statement of fact, as I enjoy computing as a subject".
Part F - Conclusion. The extended responses basically mirrored the analysis of the data from the questionnaires in that Computing Coordinators indicated that they had a host of duties to perform in addition to their teaching roles, with minimal time in which to do them. Many coordinators found that a large proportion of their time was taken up assisting other staff who had minimal skills in computer technologies, and rectifying system faults caused by inappropriate teacher and student use. To handle the range of system queries and in order to keep their skills relevant, Computing Coordinators indicated that ongoing professional development in computer technologies is essential.

Summary of Results

The results from this study clearly indicate that Computing Coordinators at Western Australian government senior high schools perceive that they do not have adequate support to perform their duties. Although there were many areas of concern, the major factors to support this finding were: the number of roles coordinators performed within their schools, lack of time afforded coordinators in the performance of their duties, minimal professional development support and for most, no technical assistance.

The following chapter will discuss the results and relate the findings to the research questions.
Chapter 5

Discussion

This chapter summarises, discusses and synthesises the results emanating from the analyses of data in Chapter 4 to address the research question, "Do Computing Coordinators at Western Australian government senior high schools have adequate support to perform their duties?" The discussion draws on the findings related to each subsidiary question and draws comparisons with Kershaw and Weber's (1991) findings. At the end of this chapter, some solutions offered by Computing Coordinators are presented.

Duties and Roles of Computing Coordinators

It proved difficult to consider a Computing Coordinator's duties in isolation from their other responsibilities. For example, the majority of coordinators were managing computer equipment during their teaching and teaching preparation time (DOTT). Also, 72% of Computing Coordinators had departmental responsibilities in addition to their coordination of computing duties, with no clear division between the two roles. Therefore, each of these topics is discussed in the light of the findings to the two subsidiary questions, "What is the nature and extent of Computing Coordinators' duties?" and "What other roles do Computing Coordinators undertake within the school?"

Teaching role. As would be expected, the main role of a Computing Coordinator was found to be teaching. Figure 16 compares the teaching load of
Computing Coordinators in this current study with those from Kershaw and Weber’s (1991) study. There were considerable differences between the time spent on teaching duties with only 10% of Kershaw and Weber’s (1991) respondents teaching in excess of 80% of a full teaching load, compared with 22% in this study who had relatively full teaching loads. A striking difference appeared to be that 65% of coordinators in this study taught between 61-80% of a full teaching load in comparison to Kershaw and Weber’s (1991) result of approximately 17%. Since the availability of technology in Western Australian senior high schools has increased since 1991, it would be expected that coordinators’ teaching hours would have reduced as their coordination of computing responsibilities increased. This was clearly not the case.

Figure 16. Comparisons between this study and Kershaw & Weber’s 1991 study of the time Computing Coordinators spend teaching.
Departmental Role. A major finding of this study was that 72% of Computing Coordinators were responsible for between one and three departments in addition to their coordination of computing responsibilities. The extent of this finding will be clarified when discussing the time consuming nature of individual coordinating duties and the level of support afforded to Computing Coordinators. However, as explained in Chapter 1, the responsibility of running a department is a separate role from that of a Computing Coordinator and should be treated as such.

Coordination of Computing Duties. There were five duties which Computing Coordinators ranked to be the most time consuming in the performance of their coordination of computing role (Table 2): maintaining software (92%); hardware maintenance (83%); installing software (60%); assisting other staff (58%); and departmental duties (42%). Each of the five most time consuming tasks are discussed here.

Software maintenance was the most time consuming duty reported by Computing Coordinators but oddly, it was not mentioned in Kershaw and Weber’s (1991) investigation. Software installation was also not mentioned in Kershaw and Weber’s (1991) study, yet it was the third most time consuming duty in this study. Perhaps these anomalies were due to increased software availability and the larger number of computer systems found to be in the schools involved in this study.
Due to the ever-changing nature of software, it is understandable that software maintenance absorbed so much time. Before maintenance is undertaken the study of manuals, on-line help, etc., may be required to determine how to complete the task. Having completed similar tasks in the past does not ensure that the same procedure can be used again to achieve the same end. Although software has become more user friendly and many commands are transferable from one piece of software to another, the host of problems that can, and do occur, obviously take up much of a Computing Coordinator's time.

There is also the possibility that coordinators lacked the skills necessary to efficiently complete what may have appeared to be simple software maintenance tasks, due to a lack of initial qualifications or insufficient professional development in new and often very complicated software configurations. However, it is unlikely that qualifications have an influence on lack of software configuration knowledge as these anomalies are usually software specific requiring exacting professional development. Although no data was collected on a coordinator's ability to perform software maintenance tasks, it is known that 62% of coordinators felt that a school's expectations of them was unrealistic. Whilst this finding may not refer to a coordinator's expertise in software configurations, 22% of coordinators in their open response did infer that schools expected them to tackle an unrealistic range of software tasks that required extensive knowledge in hardware and software configurations.
A further possible cause of the high ranking of software maintenance was given by many coordinators in their open ended responses. It was their opinion that system faults were often caused by having unskilled teaching staff inadvertently allowing students to sabotage the system with viruses or blatant vandalism. It is likely that these problems will become more prevalent as cross-curricula initiatives are furthered and non-computing trained teachers gradually become more confident in using computer technology in the curriculum.

Another issue that can influence the time consuming nature of software maintenance is the specific configuration of computer systems within the school. As explained in Chapter 4, stand-alone computer systems required individual system maintenance as opposed to those that are networked. Very few schools had their computer systems fully networked, the majority had a combination of stand-alone and networked systems, with a fifth of those surveyed maintaining a solely stand-alone set-up. Also, well over half of the schools studied required that coordinators work with three or more operating systems. Although mastering the workings and commands of operating systems is becoming less necessary as current programs are considerably more user friendly with the majority having icon based interfaces, there would still need to be a sound understanding of the operating systems.

Hardware maintenance was found to be the second most time consuming task performed by Computing Coordinators. Kershaw and Weber's (1991) study
also found that 98% of coordinators rated the maintenance of hardware as their most major duty. This was not surprising considering that an average of 72 computers were found to be in the care of Computing Computers in this current study. In Kershaw and Weber's (1991) study, only 16% of the schools had 60 or more computers in the care of coordinators.

As most computing laboratories would be expected to house 30 or less computers, it would seem reasonable to surmise that for most of the schools in this study, their computers would be placed in three or more locations. Both the number and location of computing equipment would have an influence on the time consuming nature of hardware maintenance.

The condition of hardware in schools could also affect the time taken to care for this equipment. All of the Computing Coordinators involved in this study considered that a percentage of the computer hardware in their schools was outdated in relation to continual malfunctioning (see Figure 14). Due to the high ranking hardware maintenance was afforded in relation to time, it was expected that a larger proportion of computing equipment would have been found to be outdated due to continual malfunctioning. However, in retrospect, it would only require a small percentage of old or new problem hardware to cause disruption and a considerable amount of extra work for those responsible for the care of this equipment. Also, the relatively low percentage may be due to the 58% of schools
surveyed currently leasing at least some computing equipment that may have been covered by warranties for repairs.

At the time of this study, computer hardware maintenance assistance was available to schools through contractors to the Education Department (Business Maintenance Association (BMA)). The equipment was either repaired by contractors on site or removed, repaired and returned at a later date. The latter was usually the case with metropolitan schools. Both options required checking out the hardware problem, writing a report and job order, making a telephone call to arrange repairs, waiting for the action, discussing the problem with the contractor and finally reporting on the action taken. Based on the time consuming nature of these activities and the fact that computing equipment would be out of action for some time when following these procedures, it was not surprising that 80% of coordinators perceived that getting computer equipment repaired was extremely difficult. It would seem likely that rather than put up with the increased paperwork, the delays and subsequent loss of student learning time, where possible coordinators attended to the repairs themselves. It was found that 90% of coordinators were performing the technical maintenance of computer equipment, due in part to the fact that 84% of the schools studied did not have access to a computer technician or assistant.

It would be expected that a computer technician would also be responsible for the installation of software within schools which was found to be the third
most time consuming duty performed by Computing Coordinators. Due to the individualised nature of some software, as with software maintenance, the installation of software can take up much of a coordinator's time.

Assisting other staff members with computer related queries ranked fourth in the list of time consuming duties (see Table 2). According to coordinators, their assistance was required as staff members lacked skills in computing technologies due to insufficient training and ongoing professional development. This will be discussed further when considering the support afforded Computing Coordinators in the performance of their role.

The fifth most time consuming duty performed by Computing Coordinators related to their departmental role. Unlike the other duties performed by Computing Coordinators (see Table 2), the responsibility of a department is a 'role' rather than a specific 'duty' with its own set of tasks. For example, budgeting for a department would be quite separate from budgeting for computer technology which was ranked as the tenth most time consuming duty performed by Computing Coordinators. Further consideration of coordinators' departmental responsibilities will be dealt with when discussing the issue of support.

Summary of a Computing Coordinator's roles. This study has determined that a Computing Coordinator has a range of coordination duties which they ranked based on their time consuming nature. Software and hardware maintenance
took up most of the time coordinators spent on their coordinating of computing role, followed by installing software, assisting other staff and departmental duties. Due to the reduced time ranking afforded departmental duties in comparison to the other four duties considered to be more time consuming, and the fact that HODs are automatically awarded time and a financial incentive, there appeared to be an inconsistency in not recognising the role of a Computing Coordinator as a separate substantive position.

Other roles performed by Computing Coordinators were teaching and teaching preparation and a considerable number of coordinators were also found to be in charge of one or more departments.

Impact of Coordinating Role

This section considers the findings to the subsidiary question, “Do coordinating duties impinge on other roles?”

This study found that 80% of Computing Coordinators used an average of four hours per week teaching time managing computers. Although coordinators were not asked why they were using their teaching time to manage computers, it is expected that these tasks were performed as the needs arose. Therefore, as computers would be in use during computing classes, it is anticipated that coordinators would do all that was necessary to maintain functional computer equipment so that student learning could continue.
Coordinators were found to be allocated an average of five hours per week DOTT, which is normal DOTT for a full-time secondary teacher. For most Computing Coordinators an average of three hours per week of their DOTT was taken performing their coordination of computing role, time ideally used for such tasks as preparing lessons, marking and parent contact.

Based on coordinators' extended responses, they often found themselves required to handle computer coordinating problems on a needs basis, regardless of the role they were currently performing. This was most likely due to the lack of assistance or time afforded to Computing Coordinators in the performance of their coordinating duties.

Whilst a further study would be needed to determine what affect Computing Coordinators using their teaching time and DOTT would have on student learning, the seriousness of this scenario is more than evidenced by the 88% of coordinators who considered that their coordination role was detrimental to their role as a teacher.

**Summary of the impact of a coordinator's role.** No substantial evidence is available to determine if a Computing Coordinator's role impinges on their other roles within the school. However, Computing Coordinators do consider that the time consuming nature of their coordinating duties adversely impacts on their many other roles. Further study into what affect, if any, a coordinator's duties has
on their other roles within the school is recommended, especially those relating to student learning.

Perceptions of Coordinators

Coordinators perceptions were discussed in detail in Chapter 4. Therefore, this section will summarise the situation with a view to addressing the subsidiary question, "What are the perceptions of Computing Coordinators towards their coordinating roles?"

Almost all of the Computing Coordinators in this study indicated they enjoyed using computers, however, they did appear to have a negative perception of their roles as coordinators of technology in schools. Their negative perceptions were particularly clarified in their open responses where many coordinators referred to their lack of time, funds, professional development, support and assistance and the continual increase in pressures they found themselves confronting. However, many coordinators, after providing their open response, seemed compelled to add a note that either referred to their love of teaching or using computers. Perhaps this accounts for their dedication and continued acceptance of their positions.

Whilst 44% of Computing Coordinators had considered applying for positions outside of school, further study to determine if computing teachers are leaving the schooling system to take up jobs in private enterprise would provide
some interesting data. As Callen (1991) wrote in reflection of schools failing to keep pace with technology in industry and teachers subsequent disillusionment with their current situations, “Schools seem lost in an authoritarian and conservative world and bright teachers seem eager to leave the system and join a more diverse one” (p. 26).

Qualifications and Expertise

This section considers the findings to the subsidiary question, “Does a Computing Coordinator hold formal qualifications in computing?”

As with Kershaw and Weber’s (1991) study, this study found that the majority of Computing Coordinators had gained formal computing qualifications. Also, as shown in Figure 3, a high number of Computing Coordinators held degrees in either maths or science, which was consistent with Kershaw and Weber’s (1991) findings that many coordinators completed their initial training in these curricula areas.

Only eleven Computing Coordinators were found to have no formal qualifications in computing, which is similar to that found by Kershaw and Weber (1991).

It appeared that all non-computing qualified Computing Coordinators considered their computing skills to be sufficient to perform their coordination of
computing role effectively. None of the coordinators without formal computing qualifications considered their computing skills to be inadequate, the majority perceiving their computing skills to be of a high level. The same proportion of Computing Coordinators without formal computing qualifications had the added responsibility of departmental duties as for the whole sample.

**Summary of Computing Coordinators' Qualifications.** The results from this study were consistent with Kershaw and Weber's (1991) in that very few Computing Coordinators were without formal computing qualifications.

**Level of Support**

This section discusses the subsidiary question, "What support is offered to Computing Coordinators in the performance of their duties?"

Computing Coordinators reported that minimal support was afforded them in the performance of their coordinating duties. Very few schools had access to a computer technician. A computer technician would be expected to perform many of the tasks currently performed by Computing Coordinators, e.g., hardware and software maintenance, installation of software and assisting staff with technical queries, etc. These tasks were found to take up much of a Computing Coordinator's time.
It was also disconcerting to find that 94% of Computing Coordinators found professional development support in computing inadequate. It would appear that little has changed since Kershaw and Weber’s (1991) study where only 7% of schools from the government schooling system considered the level of professional development support to be adequate.

As discussed earlier, the 1996 Government School Teacher’s Enterprise Agreement stipulates that all teachers in Western Australian government schools must complete a minimum of 20 hours per year on professional development during 1996. It is assumed, therefore, that as the majority of Computing Coordinators were spending less than 20 hours on inservice courses relating to computing (see Figure 6), they must have been attending professional development in other areas considered by individual schools to be priorities.

It should also be mentioned that it would be difficult to determine from this study what degree of professional development in computing undertaken by Computing Coordinators was associated with actual teaching, from the professional development coordinators undertook for their coordinating role.

Possibly due to the lack of support in the form of time and funds for professional development, only 16% of Computing Coordinators were involved in curriculum development or syllabus committees compared with the 80% recorded in Kershaw and Weber’s (1991) study. Also, very few of the coordinators in this
study were members of recognised technology groups or associations, such as the Educational Computing Association of Western Australian (ECAWA). These committees and groups take on the form of professional development in that coordinators can gain considerable knowledge and skills in computing by their attendance.

Due to the rapid evolution of computer technology, professional development requires much more than formal training or professional networks. Various incidental and planned learning experiences, such as contact with fellow colleagues, reading of current texts and journals and self training of software, are necessary to keep skills up to date. Whilst coordinators spent an average of seven hours per week of their own time on this form of informal training, a degree of support from the schooling system should have been afforded them to carry out this training.

The pilot study determined that if Computing Coordinators were allocated time for their duties external to teaching and teaching preparation, this time allocation was for the performance of both their coordination of computing and, if relevant, their departmental duties. It would appear, therefore, that in many instances, the role of a Computing Coordinator and that of a HOD or TIC has been amalgamated in relation to calculating a time allocation for these roles. This study found that whilst 64% of coordinators were allocated an average of four hours per week to perform all of their duties external to teaching and DOTT, once the award
time allocated to coordinators with departmental duties was taken into account, only 26% or coordinators were left with an average of three and a half hours per week to perform their coordination of computing duties. The remaining 74% of Computing Coordinators received no support in the form of time and, in addition, 54% of all coordinators did not receive a financial incentive for either their departmental or coordination of computing role.

Further consideration should also be given to the fact that coordinators ranked the time consuming nature of their departmental duties considerably lower than the maintenance of hardware and software, installing software and assisting other staff. Therefore, this study displays evidence that the role of a Computing Coordinator is more time consuming than that of a HOD or a TIC and yet minimal support is afforded them in the form of time for the performance of coordinating role.

Summary of level of support. This study found that minimal support in the form of time, funds, professional development and assistance was afforded to Computing Coordinators in the performance of their coordination of computing duties. As much of this support is decided at the school level, the Principal would need to be aware of the duties required of a Computing Coordinator. It was the perception of 80% of the coordinators in this study that Principals did not understand the role of a coordinator of computing.
According to coordinators, an average of eight hours per week were necessary for them to perform their duties. Obviously, the number of hours increased in line with the requirements of their position, e.g., number of computers, location and condition of hardware. Clearly, Computing Coordinators were not allocated sufficient time to perform their role, evidenced by the majority of coordinators using a considerable proportion of their teaching time and DOTT to manage computers.

Conclusion

In view of the findings of this study, this section will consider the research question, “Do Computing Coordinators at Western Australian government senior high schools have adequate support to perform their duties?”

Kershaw and Weber (1991) indicated that there was a need to determine whether the roles performed by coordinators were “perceived demands” or the result of “changing expectations of the school employing authority as its technological equipment grows and curriculums are influenced” (p. 106). Based on the findings of this study, it would seem clear that coordinators were continuing to perform an increasing number of duties as a reaction to a need that was not being met by other means.

On studying Kershaw and Weber’s (1991) research and analysing the finding of this current study, it would appear that very little has been done to
increase the support afforded to Computing Coordinators. Further, coordinators are continuing to take on increasing demands as technology expands within their schools. Computing Coordinators have found support for these increased demands lacking, especially in relation to the time afforded them in the performance of their coordinating role.

To address these demands, the following section outlines a number of solutions made by Computing Coordinators in an effort to alleviate some of the pressures of a coordinator's roles.

**Coordinators' Solutions**

Many of the Computing Coordinators in this study took the time to put forward some suggestions on how best to rectify their current concerns. Coordinators' solutions were placed in a coding frame to determine like responses. The five most common solutions made by Computing Coordinators are outlined. Basically, all of the five remedies involve increased funding. They were as follows:

**Solution 1 - Realistic time allocation for coordinating role**

An award time allocation should be in place for the coordination of computing role. This time allocation should be based on: the number, locations and condition of equipment; number of staff in the school; number of operating system platforms; and any other criterion that
could effect the time required to perform the required duties efficiently.

**Solution 2 - Lease or purchase of current computer hardware**

It was anticipated that the lease or purchase of current hardware would not only allow schools to run up-to-date software and therefore give students more relevance to their learning experiences but would hopefully reduce the percentage of computer equipment that continually malfunctioned.

**Solution 3 - Industry standard and up-to-date educational software**

Today's standard software is a far cry from what is currently used at many senior high schools. Whilst it would be fair to say that most schools are currently running adequate software on at least some of their equipment, as 74% of coordinators indicated, much of the new software available would increase motivation and provide a wider range of resources, e.g., Internet, subject orientated, self paced and multi-media software.

**Solution 4 - Acquisition of a part or full-time technician as necessary**

Coordinators considered that a full-time computer technician should be employed by schools that have in excess of 50 computers and pro-rata for less. It is their opinion that if computer technicians were
available in schools to perform the maintenance tasks, they would have more time to plan and organise technology within their schools and assist others with the integration of technology into the curriculum. Of course, that is on the assumption that coordinators get time in the first place. This solution would also allow coordinators to teach unhindered as the technician would be on hand to address any systems queries.

**Solution 5 - Adequate professional development for all staff members**

Quite apart from the time and possible expense involved with professional development in Kershaw and Weber’s (1991) study, it is also likely that the training of staff, parent courses and involvement in professional associations, were all completed outside of school hours. Further activities relating to technology training in a Computing Coordinator’s own time and at their own expense, would amount to placing them under even further pressure. Recognising the need for teachers to keep their technological skills relevant, Callen (1991) feels that “teachers hibernating for long periods in schools will become like museum pieces” (p. 28). Due to the continual rapid changes in technology, this would most certainly be the case for teachers using technology if they did not update their skills on a regular basis. Realistic measures by governments need to be taken to provide
assistance to Computing Coordinators in their efforts to keep their skills relevant and thus avoid this scenario.

All staff need sufficient professional development to keep their skills current. The present situation requires that individual's bear much of the responsibility and cost of their own training. Priority for non-computing staff would most likely be within their own curriculum area rather than an emphasis on developing computing skills. Whilst teacher training is beginning to address this issue, non-computing staff that have been teaching for some time have little or no skills in the use of technology. This situation needs to be rectified if the current initiative of cross-curriculum integration of computer technology is to succeed.

Computing Coordinators have indicated that they already spend a considerable amount of their own time on formal and informal professional development. Action needs to be taken to improve the current level of support which ranges from inadequate to non-existent.

Implications

The implications of the findings of this study are discussed in the next chapter together with some recommendations for schools and future research.
Chapter 6

Recommendations and Conclusions

The results of this research indicate the need for clearly defined expectations of the roles placed on Computing Coordinators, together with a provision for necessary support. There must also be some recognition that time requirements for coordinators to perform their roles vary depending on the extent of their duties, and should be calculated accordingly.

In view of the findings of this study, this chapter will offer some recommendations for schools and relevant employment bodies to help meet the demands associated with a coordinator's position. Recommendations for future research will also be addressed. The final section of this chapter will conclude this paper.

Recommendations for Schooling Systems

A recent editorial in PC User, an Australian computer magazine, referred to a “significant mindshift at government level” over the past year “about the need to equip our schools for the coming information revolution, let alone the new millennium” (Dancer, 1996, p. 48). Currently, millions of dollars are being ploughed into technology initiatives within Australian schools (Bogle, 1997). The results of this study would seem to indicate that schools are becoming more and more equipped for this revolution in terms of machinery and what they hope to do with it but very little has changed over a decade with regard to providing for its
care. Bogle refers to critics who feel that “Too much emphasis is placed on hardware ... and not enough on people - the teaching and technology support staff need to make it work.” If Computing Coordinators are to take a leading role in the planning phase of technology integration, as this study appears to demonstrate they already are, some of the current burdens that are placed on them need to be removed.

To ‘make it work’, plans need to be put in place for the ongoing care of technology equipment in schools. Further, if technology integration within our schools is to be taken seriously, adequate training and professional development of all staff is necessary.

Providing for technology in schools. Quite apart from the initial financial outlay of providing for hardware and software in schools, funds must be made available to provide for the ongoing care and replacement of obsolete equipment placed in schools. EDWA’s Technology 2000 Strategic Plan (1996a) to “establish and manage support contracts for schools to purchase technical support at competitive prices” and “provide flexible opportunities for schools to provide their own technical support staff” (p. 2) is intended to partially address these needs. However, this study found that a major disadvantage for the majority of Computing Coordinators is their lack of access to a computer technician. Urgent action must be taken to provide all schools with equality of access to qualified computer technicians and adequate access to these technicians to alleviate some of
the pressures currently placed on coordinators in their coordination of computing role.

This study has provided a clear indication of the roles performed by Computing Coordinators so that staffing at the Western Australian Education Department or school level can determine realistic time allocations for Computing Coordinators to perform their duties. The results could also assist in the determination of the duties and essential and desirable criteria for job selection as a Computing Coordinator.

Considering the array of tasks performed by coordinators and their obvious time consuming nature, it would seem clear that the duties of Computing Coordinators should be separated from those involving departmental duties and each position recognised in its own right in relating to status, time and rewards.

**Adequate professional development.** A major step towards increased support would be adequate professional development in computer technology for all staff, including Computing Coordinators, who intend integrating computers into the curriculum. However, it has already been determined that 94% of Computing Coordinators considered their current level of support towards professional development in computing as inadequate. As all teachers need to remain current with respect to skills within their subject areas, it is unlikely that sufficient time, funds and support would be available for external training in
technology. As is currently the case for Computing Coordinators, much of this professional development would need to be done in a teacher’s own time and at their own expense. This situation needs to be rectified.

All too often, technology training has been left up to individuals “who are prepared to spend their own time learning programs and figuring out ways to integrate them into their teaching” (Bogle, 1997). This could be due to the fact that professional development in the area of computer technology can be very costly. Costs can range from $140 for an intensive short course in Word for Windows (Keeping up with Computers, 1997) to modules run by Com Tech Education Services for the study of Microsoft Windows NT, ranging in price from $420 for a one day course to $2000 for a five day module (1997). The need for continual professional development in the area of computer technologies is evidenced by the large number of computing courses on offer in training sections of newspapers. Provision for professional development in computer technologies for all staff should be a priority. Perhaps these issues should be taken into account when planning whole staff professional development.

Recommendations for future research

With technology set to “catapult classrooms into the information age” (Bogle, 1997), ongoing research into the provision for technology within Australian schools is essential. With the massive funds that are currently being allocated for technology within schools, it would seem reasonable to suggest that
plans be put in place to determine how schools are coping with this increased technology. As stated in Chapter 1, these plans would need to take into account the conflicting state policies, the differences between private and public schools and school type and size.

A further area for consideration would be to determine the specific role and status of a Computing Coordinator. This study displayed evidence that a Computing Coordinator’s role depended on the demands of individual schools. There appeared to be no equity of time consideration even among those coordinators who were found to have departmental duties. It is anticipated that once the role and status of a Computing Coordinator is determined, and adequate provision made for this position, it will be recognised as a separate role from that of a HOD or TIC.

It is also recommended that research be undertaken to determine what affect, if any, a Computing Coordinator spending both teaching time and DOTT on managing computer systems is having on student learning. The results of this study could have serious implications with regard to accountability of teachers within the classroom.

**Conclusion**

This study determined that Computing Coordinators found themselves performing ever increasing roles to keep pace with technology within their
schools. For the majority, no recognition in the form of time was awarded them to specifically carry out their coordinating duties. Less that half received a financial incentive, however, for many, this payment may have been awarded for their less time consuming departmental duties. Coordinators were finding it extremely difficult to balance their coordinating duties with that of their teaching role. Consequently, most believed that their coordinating role had a negative impact on acceptable classroom conventions.

Support in the form of time and funds for professional development to keep pace with the complex changes in technology were also lacking. Despite initiatives to ensure all teachers in Western Australian schools complete in-service during 1996 and 1997 (Government School Enterprise Agreement, 1996), this study has shown that little has changed with regard to coordinators' opinions that current professional development support in computing for themselves, and in fact all teaching staff, was inadequate. Teachers in all curriculum areas will need considerable professional development in computer technologies if they are to recognise the value of using the computer as a tool to enhance teaching and learning and apply it within their classrooms. However, computers have been in Australian schools for approximately three decades and yet their success seems to "depend on individual teachers who have a flair for technology" (Bogle, p. 5, 1997). This situation could be attributed to the general lack of professional development in computing in schools and coordinators' lack of time to provide assistance in their already over-loaded schedules.
The initiative by EDWA to provide technical support for computer technology, commencing 1998 and finally in all schools by the year 2001, may reduce some of the tasks performed by Computing Coordinators (1996a). However, EDWA will need to ensure that their initiatives provide adequate assistance for the specific needs of individual schools and that this support is capable of handling the broad and complex tasks, if they hope to alleviate some of the pressures currently placed on Computing Coordinators.

Kershaw and Weber's (1991) study highlighted the lack of support afforded Computing Coordinators at Australian high schools. This study has shown that the pressures placed on coordinators at Western Australian government senior high schools have grown rather than diminished. Clarke wrote in reference to a coordinator's role, "At no time in the past decade has there ever been any recognition of this role or the time that it demands, yet in that time the number of computers to be administered has increased ..." (1994, p. 270) The employing bodies need to consider that Computing Coordinators are teachers in the first instance and that their coordinating role is a separate part-time extension of this. None of the duties required of them as coordinators should affect their teaching time and other commitments. This can only be achieved if adequate time and assistance is awarded to coordinators, based on the specific requirements of individual schools. For example, required support is influenced by the number, type, location, set-up and condition of equipment, school staffing numbers and school priorities as they relate to how technology is to be utilised within the
school. If these measures are not taken as a matter of urgency, it is the finding of this study that the pressures currently felt by coordinators will escalate as technology expands within Australian schools.
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APPENDIX A
Survey of Western Australian Computing Coordinators at Government Senior High Schools (1996)

Please circle or fill in the blanks as appropriate to answer all questions on the following questionnaire.

NOTE:
Your completion of this questionnaire will provide valuable data for future planning. All efforts have been made to make it as brief as possible. It should only take a few minutes to complete.

PART A - BACKGROUND AND TRAINING
1 Gender
   M F

2 Is Computing your MAJOR specialisation area? YES NO
   If NO, your major area is: _______________________

3 Have you a SECONDARY specialisation area? YES NO
   If YES, your second teaching area is: _________________

4 How many years have you been a Computing Coordinator? ______ years

5 When did you first start to use a computer?
   Never 1
   During the last year 2
   About 2 years ago 3
   About 3 years ago 4
   4 or more years ago 5

6 Have you completed any FORMAL computer related qualifications? YES NO
   If YES:
      (a) What is your HIGHEST computing qualification?

         ________________________________

      (b) What year did you first commence FORMAL computer related training? 19

      (c) What year did you complete your FORMAL computer related training? 19

7 Are you currently enrolled in FORMAL computer related studies? YES NO
   If YES:
      Indicate your course of study:

8 If NO formal computing qualification:
   (a) Would you consider your computing skills as:
      Low level 1
      Average level 2
      High level 3
      Very high level 4

   (b) How were these computing skills attained:
      (Brief statement, e.g., self taught)

PART B - PROFESSIONAL DEVELOPMENT
9 How many hours per year (average) do you spend on inservice courses related to computers in the school?
   (Include both educational and technical courses)
   0 hours 1
   1 - 10 hours 2
   11 - 20 hours 3
   21 - 30 hours 4
   31 - 60 hours 5
   more than 60 hours 6

10 In your opinion, what level of support e.g., time off, payment of course fees, do you receive from your school for your own professional development in COMPUTING?
   (Those other than for an accredited award)
      None 1
      Inadequate 2
      Barely adequate 3
      Adequate 4
      More than adequate 5

11 Are you involved in curriculum development or syllabus committees within WA? YES NO

12 Are you part of a FORMAL network of computing teachers that meets during the school year for support, advice, exchange of ideas? YES NO
   If YES:
      How often do you meet?
         Once a year 1
         Twice a year 2
         Four times a year 3
         Twice a term 4
         Monthly 5
         More often 6

13 Are you a member of a recognised technology group or association? YES NO
   If YES:
      How often do you meet?
         Once a year 1
         Twice a year 2
         Four times a year 3
         Twice a term 4
         Monthly 5
         More often 6

14 How much time do you spend on INFORMAL training relating to computers in the school? Include here time spent updating your skills through associate contact, study of text, hardware and software evaluation, tutorial training, etc. (Only those areas not covered so far)
   Average number of hours per week ______ hours

99
PART C - TEACHING TIME

15 Are you currently teaching any subjects? YES NO

If YES: (please answer in HOURS only)
(a) How many hours per week do you teach? __________ hours

(b) Are you currently teaching any computer related subjects? YES NO

If YES:
(c) How many hours per week do you teach computing? __________ hours

(d) How many hours per week are you allocated for teaching preparation? __________ hours

(e) How much of this teaching preparation time is spent managing computers? None, Time in hours __________ hours

(f) Do you perform any technical maintenance of computing equipment? YES NO

If YES:
(a) Have you formal qualifications in this area? YES NO

(b) Are these duties in your job specification? YES NO

21 Do you perform any technical maintenance of computing equipment? YES NO

If YES:
(a) Have you formal qualifications in this area? YES NO

(b) Are these duties in your job specification? YES NO

22 What type of computer set-up do you have?

Network 1
Stand-alones 2
Mixture 3

23 What type of computer set-up do you have?

Network 1
Stand-alones 2
Mixture 3

24 How many staff do you liaise with in this capacity? No. __________

25 Rank the following list of Computing Coordinator's duties. Select 1 as your most time consuming duty, 2 as your next most time consuming and so on. (Please do not use the same number twice)

Evaluate hardware __________
Inservice staff __________
Hardware maintenance __________
Install software __________
Maintain software (e.g., corrupt files, etc.) __________
Preparation of reports/budgets __________
Negotiations with suppliers __________
Assist Admin. with system queries __________
Assist other staff with system queries __________
Teacher in Charge duties (If applicable) __________

Other: __________
### Part E - Coordinators' Perceptions

30. For each of the statements below, circle the number that best describes your agreement or disagreement with the statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

| 1 | 2 | 3 | 4 | 5 |

a) I enjoy using computers

| 1 | 2 | 3 | 4 | 5 |

b) I have a high profile at my school.

| 1 | 2 | 3 | 4 | 5 |

c) I am given ample time to perform my duties as coordinator.

| 1 | 2 | 3 | 4 | 5 |

d) I am given ample time to perform duties in all my roles.

| 1 | 2 | 3 | 4 | 5 |

e) School principals understand the duties required of Computing Coordinators.

| 1 | 2 | 3 | 4 | 5 |

f) The schools' expectations of a Computing Coordinator are unrealistic.

| 1 | 2 | 3 | 4 | 5 |

g) Getting machines repaired is easy.

| 1 | 2 | 3 | 4 | 5 |

h) I take on more than is actually required of me in my role as coordinator.

| 1 | 2 | 3 | 4 | 5 |

i) There are more rewarding (financially) or otherwise job opportunities in computing outside school.

| 1 | 2 | 3 | 4 | 5 |

j) I have recently considered applying for a computing position outside school.

| 1 | 2 | 3 | 4 | 5 |

### Part F - Coordinators' Responses

To complete this questionnaire, could you please write a brief statement to discuss any major problems you are experiencing in your current roles and perhaps offer your own solutions.

---

Thank you for the time you have taken to complete this survey. I can assure you that your input will provide useful information.
APPENDIX B
22 August 1996

Dear Principal

COMPUTING COORDINATOR SURVEY

I wish to request approval for your school to take part in a census survey I am conducting to ascertain the duties performed by Computing Coordinators in Western Australian Government Senior High Schools.

It is anticipated that all Government Senior High Schools in our state will take part in this survey that is intended to determine the nature and extent of the roles undertaken by Computing Coordinators and to gain an insight into the time involved in order for them to perform these duties. It is imperative that this data be collected to increase awareness of the possible pressures that may be placed upon Computing Coordinators and, where necessary, look at measures to alleviate them. The results will take the form of an hours thesis as part of my Bachelor of Education and possibly seminars with technology groups within our state who have already indicated an interest in my investigation.

In order to facilitate this survey, I have forwarded a letter of request and survey questionnaire, under separate cover, to the Computing Coordinator at your school. If you have any objection to your school taking part in this survey, could you please advise your Computing Coordinator of your concerns.

I wish to assure you of anonymity with regard to this investigation. Neither your school or staff names will be referred to in my findings, which are intended to be released towards the end of this year.

If you wish to contact me with regard to this survey, a message can be left at (personal details have been omitted).

Yours faithfully
26 August 1996

Dear Computing Coordinator

As a fellow teacher of computing, I am writing to request your assistance in a census survey I am conducting to ascertain the duties performed by Computing Coordinators at Western Australian Government Senior High Schools.

Computing coordinators are often placed under extreme pressure to ensure all is functioning smoothly in their computing labs so that teaching can continue unhindered. It is their responsibility, expected or self perceived, to maintain and evaluate the hardware and software, assist colleagues and perform various other associated administrative duties. Coordinators are obligated to stay abreast of new technology with regard to professional development and to handle an ever-increasing workload as technology expands within their schools. In addition, many computing coordinator's perform the regular duties associated with running one or more departments. This is a tall order considering that many coordinators have large teaching loads requiring the usual preparation, evaluation and assessment.

It is the intention of this investigation to determine the nature and extent of the roles undertaken by computing coordinators. The findings will portray the assistance, time, financial incentives and recognition afforded them with a view to determining equability across the state and will look at possible solutions to alleviate any pressures that may be placed on them. The results will take the form of an honours thesis as part of my Bachelor of Education and possibly seminars with technology groups within our state who have already indicated an interest in my investigation.

I wish to assure you of anonymity with regard to this investigation. The response slips will be stored separately and destroyed once all questionnaires have been received. Neither your name nor school will be referred to in my findings, which are intended to be released towards the end of this year.

Whilst I realise how pressed you may be for time, I would like to stress the importance of this survey in providing timely data that may be used in forward planning and in turn, personally assist you in the future. Therefore, could you please complete the attached questionnaire and response slip below and return it to me via the inter-school mailing system utilising the pre-addressed envelop supplied.

If you have any problems with the completion of this questionnaire, a message can be left for me at (personal details have been omitted).

__________________________________________________________________________

I (name) ........................................ of (school) .........................................................

give consent to the anonymous use of attached questionnaire data for publication purposes.

Signed ...........................................
21 October 1996

Dear Computing Coordinator

I refer to my recent correspondence to you with regard to the census survey I am conducting to ascertain the duties performed by Computing Coordinators at Western Australian Government Senior High Schools. Currently over 50% of recipients have returned their completed questionnaire. As some respondents omitted to complete and return their consent form, I am unable to fully determine which schools have responded. Therefore, if you have NOT already forwarded your questionnaire form, I would be grateful if you could complete the questionnaire enclosed and consent form below and return it to me in the attached envelope. Please ignore this letter if you have already responded.

I have already commenced extracting statistics from the data received with some interesting results. For example, 98% of recipients consider that their role as Computing Coordinator impinges on their role as a teacher. With this in mind, and the obvious need to address many of the issues raised in this research, I would like to further stress the importance of this survey in providing timely data that may be used in forward planning as technology expands within our schools.

Once again, I wish to assure you of anonymity with regard to this investigation. The response slips will be stored separately and destroyed once all questionnaires have been received. Neither your name nor school will be referred to in my findings, which are intended to be released towards the end of this year.

If you have any problems with the completion of this questionnaire, a message can be left for me at (personal details omitted).

I (name) .................................................. of (school) ..........................................................

give consent to the anonymous use of attached questionnaire data for publication purposes.

Signed ..........................................

(Follow-up letter sent to Computing Coordinators at Western Australian government senior high schools.)