RESEARCH ONLINE

University of Wollongong
Research Online

Faculty of Business - Accounting & Finance Working Papers

Faculty of Business

1992

A Survey of EDP Audit Content and Audit Software Package Application in Undergraduate Auditing Subjects Offered at Australian Universities

R. P. Shannon
University of Wollongong

B. McCartney
University of Wollongong

Publication Details

This working paper was originally published as Shannon, RP and McCartney, B, A Survey of EDP Audit Content and Audit Software Package Application in Undergraduate Auditing Subjects Offered at Australian Universities, Accounting & Finance Working Paper 92/40, School of Accounting & Finance, University of Wollongong, 1992.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

RESEARCH ONLINE

UNIVERSITY OF WOLLONGONG

DEPARTMENT OF ACCOUNTANCY

A SURVEY OF EDP AUDIT CONTENT AND AUDIT SOFTWARE PACKAGE APPLICATION IN UNDERGRADUATE AUDITING SUBJECTS OFFERED AT AUSTRALIAN UNIVERSITIES

by

Robert P Shannon and Barbara McCartney
University of Wollongong
PO Box 1144,Northfields Avenue
WOLLONGONG NSW AUSTRALIA 2500

November 1992

WORKING PAPER NO. 40

A SURVEY OF EDP AUDIT CONTENT AND AUDIT SOFTWARE PACKAGE APPLICATION IN UNDERGRADUATE AUDITING SUBJECTS OFFERED AT AUSTRALIAN UNIVERSITIES

by

Robert Shannon* and Barbara McCartney**

*Senior Lecturer and **Lecturer

Department of Accountancy
University of Wollongong

ABSTRACT

This paper examines EDP audit content and audit software package application in undergraduate auditing subjects offered at Australian universities.
Empirical evidence is presented of some institutional failure to:
1. meet the EDP knowledge requirements to be an auditor in the 1990s;
2. include practical application experience of available audit software packages;
3. develop more realistic Australian EDP auditing practice cases.
The EDP topics which appear to be underemphasised are identified. Methods to increase student exposure to the capabilities of, and hands on use of, available audit software packages are described. The development of Australian EDP auditing practice cases for use in both one semester auditing subjects and separate EDP Auditing subjects is considered to be a priority if students are to be adequately prepared for audit practice in the 1990s.

Acknowledgement
The authors wish to express their appreciation to Mr. Iman Wahyudi for his assistance in the preparation of this paper.

INTRODUCTION

In the 1970's and 1980's, research in the U.S.A. attacked existing curricula in undergraduate accounting education programmes for their failure to meet the data processing knowledge requirements to be an auditor (AAA 1974, Jancura 1975, AICPA 1979, Jancura and Nance 1981, Skudrna 1982, Dawley 1983) and for tending to stress "theoretical issues" whilst downgrading the application side of auditing (Martin and Whisnant 1982). Too much of the "education-training obligation" was seen to be transferred to the practitioner (Cohen Commission 1978).

Educators in U.S.A. were urged to upgrade their undergraduate accounting curricula to meet required EDP audit knowledge and to include more practical application experience, especially in the audit of EDP systems and in the use of computers as an audit tool. Such knowledge and experience was deemed necessary in order to perform a competent and proficient audit (Kanter and Pitman 1987, p.251).

A review of the Australian literature uncovered no objective documentary evidence of the existence of similar failures or calls for upgrading.

This paper outlines the results of a recent survey of Australian universities which has attempted to obtain evidence of the existence, or otherwise, of similar failures in Australian undergraduate accounting education programmes in the 1990's.

SURVEY METHOD AND DATA ANALYSIS.

Questionnaires were mailed to the accountancy departments of all 49 Australian universities listed in the 1990 Directory of Accounting Academics Australia/New Zealand.

An instruction requested that the questionnaire should be completed by the co-ordinator of each undergraduate auditing subject offered. If more than one subject was offered, the questionnaire was to be photocopied and separately completed for the additional subject(s).

Completed questionnaires were received from 24 universities, representing a 49% response rate. As confidentiality was promised, it was impossible to determine which universities responded and therefore whether respondents were representative of the total population. The response rate was, however, well above the typical 20% to 40% rates for mail surveys (Nachmias and Nachmias 1976, p.108)

The questionnaire contained eleven questions.

Questions 1 to 9 were designed to collect general data about undergraduate auditing subjects and requested the following details: names of each subject offered; year in accounting programme offered; number of students enrolled; duration of each subject; student contact hours; prescribed textbook(s); method of assessment; subject description; and subject objective.

Questions 10 and 11 were specific to EDP audit.

Question 10 dealt with EDP audit content in each undergraduate auditing subject. It was designed to ascertain details about the: coverage of; importance of; and lecture time spent on 17 specified EDP auditing topics. These topics were identified from an analysis of three popular auditing textbooks (Gill et al 1989, Arens et al 1990, Gul et al 1991); three contemporary EDP auditing textbooks (Weber 1982, Watne et al 1984, Chambers et al 1986); a guide issued by AICPA (1979); and the Auditing Standard (AUP4) prepared by the Auditing Standards Board of the Australian Accounting Research Foundation. All were considered to be topics that auditors in the 1990's

would need to be familiar with. The question also allowed respondents to add detail about any other topics covered.

Question 11 dealt with computer assisted learning for each undergraduate auditing subject. It was designed to ascertain information about audit software package application by students and/or by staff (or outsiders such as practitioners). Details requested were: the names of packages used; texts (if any) used to assist students in this work; who taught the packages; how the packages were taught; work required to be submitted related to the packages; and percentage of the students' assessment mark this work represented.

RESULTS

The results are presented in three sections:

1. General information about undergraduate auditing subjects;
2. EDP audit content in undergraduate auditing subjects;
3. Audit software package application.

1. GENERAL INFORMATION ABOUT UNDERGRADUATE AUDITING SUBJECTS

The results show that all 24 respondent universities offer at least one undergraduate semester subject in auditing, and that this subject is usually called "Auditing" or "Advanced Auditing". Only two respondents offer an additional undergraduate semester subject called respectively, "EDP Auditing" and "Management Systems Control and Audit". The subjects are offered to third year students, although some respondents said that their subject is open to second year students.

The number enrolled ranged from 24 to 700 with a mean of 201. This is consistent with Neale and Hasseldine's (1991) study of Australian and New Zealand audit courses, which found a range from 32 to 710 with a mean of 195.

Responses indicate that the mean time spent teaching was 47 hours (lectures 26 hours with a standard deviation (sd) of 5 hours, tutorials 16 hours with a sd of 6 hours, workshops/computer laboratories 5 hours with a sd of 4 hours). It would appear the typical teaching contact is two hours of lectures and a one hour tutorial per week over a 14 week semester. These details support prior U.S.A. research (Engle and Elam 1985) indicating that a majority of undergraduate accounting programmes in the U.S.A provide one "three-semester-hour" auditing subject.

The most popular prescribed textbooks are Arens, Loebbecke, Best and Shailer, "Auditing in Australia" and Gul, Teoh and Andrew, "Theory and Practice of Australian Auditing". Other texts in minor use are Gill and Cosserat, "Modern Auditing in Australia" and Defliese et al, "Montgomery's Auditing".

Additional reference books include ICA and Society "Auditing Standards"; case study practice sets (Weiss and Smith, "Systems Direct Auditing Practice Case" and Taylor and Glezen, "Case Study in Auditing"); AARF Audit Monographs (Trotman, "Analytical Review" and Godsell, "Auditors' Legal Duties and Liabilities in Australia"); AARF Audit Guides ("Audit Sampling" and "The Audit of Small Business Financial Reports"); and Mautz and Sharaf, "Philosophy of Auditing".

With regard to assessment of students' performance, all 24 respondents use final examinations; 10(42%) include assignments; 10(42%) include term tests/mid-semester examinations; 10(42%) include tutorial participation; 6(25%) include case studies; and only 5(21%) include essays.

Emphasis appears to be placed on final examinations which account for an average of 63% of the students' total mark (with a sd of 10%) with the balance being spread reasonably equally between assignments, case studies, and term tests/mid-semester examinations (means of approximately 25% with sd of approximately 10%); with essays averaging 16% (with a sd of 2%) and tutorial participation averaging 9% (with a sd of 3%). These results are reasonably consistent with Neale and Hasseldine's (1991) study, which found similar emphasis on final examinations (mean 67%, sd 12%) and a similar spread between assignments, case studies, and term tests/mid-semester examinations (means in low 20's% with sd of approximately 12%).

The subject objective of 16 of the 24 respondents (67%) is to provide students with conceptual and practical knowledge of auditing. A further six (25%) wish only to provide conceptual knowledge. Two (8%) gave other responses. These results would appear to show a major change in objective from Martin and Whisnant's (1982) U.S.A. study, which found that only 12% of U.S.A. educators believed that their primary objective was to prepare students for practice, with the majority (67%) stating that their primary objective was to provide an "overview" of auditing.

2. EDP AUDIT CONTENT IN UNDERGRADUATE AUDITING SUBJECTS

The Institute of Chartered Accountants in Australia (1989) specifies broad accreditation requirements for tertiary courses. Within the subject area of EDP auditing, only an "intermediate" level of study and a "medium" knowledge level in both the principles of internal control in a computer environment and in computer applications in auditing is specified. It would appear that all respondents meet these requirements.

Tables I and II show respectively, the EDP audit topics covered in each undergraduate auditing subject by the 24 respondents, and their point of view about the importance of the topics in relation to their subject's objective.

(Tables I and II about here)

Clearly, nearly all, if not all, the respondents cover the basic topics categorised under the heading "the impact of EDP systems on accounting systems and related controls" (impact of EDP systems on auditors; the characteristics of EDP systems; and internal controls in EDP systems--general EDP controls and EDP application controls). More advanced topics related to controls in different environments (on-line computer, microcomputer, database management, and service bureau) were covered by 17(71%), 16(67%), 12(50%), and 10(42%), respectively of the 24 respondents.

All but two respondents, deal with the four topics categorised under the heading "review and evaluation of EDP internal controls".

Nearly all cover basic topics categorised under the heading "the use of CAATs as an audit tool in an EDP environment" (audit tasks performed, considerations in the use, and types of CAATs). However, only 15 (63%) cover the topic dealing with examples of the application of CAATs in tests of transactions and substantive tests of account balances, and an even smaller number cover the topics, steps in CAAT application (13 54%) and documentation of CAATs (10 42%).

For the majority of topics, a comparison of Tables I and II shows reasonable consistency between the percentage of respondents which covered each EDP audit topic and the percentage of respondents which considered each topic to be "important" or "somewhat important". Only seven topics dealing with controls in different environments (topics 4, 5, 6 and 7); steps in CAAT application (topic 15);

documentation of CAATs (topic 16); and examples of the application of CAATs in tests of transactions and substantive tests of account balances (topic 17) showed a much lower percentage of respondents which covered the topics compared to the combined percentage of respondents which considered the topics to be "important" or "somewhat important". It would appear that these topics may be under emphasised by some respondents.

To further evaluate this conclusion, data from Tables I and II were tabulated to give a 2x3 table for each EDP topic and a Chi-square test applied.

Topic covered in subject	Importance of the topic			Total
	Important	Somewhat Impt.	Unimportant	
Yes	a	b	c	a+b+c
No	d	e	f	d+e+f
Total	a+d	b+e	c+f	n

Cells 'a', 'b' and 'c' represent the frequency of universities which covered a topic and which considered the topic "important", "somewhat important" and "unimportant" respectively.

Cells 'd', 'e' and 'f' represent the frequency of universities which did not cover a topic and which considered the topic "important", "somewhat important" and "unimportant" respectively.

The chi-square test shows that the decision of the universities to cover these same 7 topics listed above are dependent on their point of view about the importance of the topics. (All the other topics are shown to be independent of the universities' points of view of importance.) As all 17 of the topics were considered by authorities to be topics that auditors in the 1990's would need to be familiar with, it would appear that

these topics are underemphasised because of an incorrect assumption that they lack importance.

(Table III about here)

Table III shows the average time spent lecturing EDP auditing topics by the 24 respondents. It would seem that 5.22 hours on average is spent lecturing EDP audit topics. This is remarkably higher than Engle and Elam's (1985) U.S.A. study's findings which show that the average time spent on EDP audit topics by AACSB accredited colleges and non-accredited colleges was only 2.92 hours and 2.70 hours respectively.

The largest proportion of lecture time is allocated to topics under the heading of "impact of EDP on accounting systems and related controls" (2 hours on average), with topics related to the "review and evaluation of EDP internal controls" taking an average of 1.48 hours and topics related to the "use of CAATs as an audit tool in an EDP environment" taking an average of 1.74 hours.

In relation to the average time spent lecturing auditing (26 hours), 5.22 hours represents approximately 20% of the total lecture time. It would seem that on average EDP audit topics are covered over approximately 2.5 to 3 weeks of a 14 week semester.

3. AUDIT SOFTWARE PACKAGE APPLICATION

Table IV provides results about the names of audit software packages used by the 24 respondents.

(Table IV about here)

Given that the objective of 16 of the 24 respondents (67%) was to provide students with conceptual and practical knowledge of auditing, it is surprising that only 14 (58%) of the respondents use audit software packages in their auditing subjects and even more surprising that only 11 (42%) involve students in actual hands-on use of the package.

It would appear that many students may not be gaining knowledge of the capabilities of available audit software packages and even more may not be gaining experience in the hands-on use of these packages.

The results show that only seven packages are used by students and staff/outsiders, with only CARS, D-Base III+, and Lotus123/VP Planner/other spreadsheets being used by more than one respondent.

Three packages are used by students without any direct staff/outsider involvement: Systems Direct Auditing Practice Case by Weiss and Smith; Case Study in Auditing by Taylor and Glezen; and Pre-audit--Coopers and Lybrand.

Three packages are used in staff/outsider demonstrations without any hands-on student involvement: Pre-audit--Coopers and Lybrand; Craft Audit Sampling Assistant; and KPMG--File Analysis Tool.

Of the eleven respondents which involve students in actual hands-on use of a package, approximately one-half use notes/handouts to assist students in this work, whilst others mainly use practice cases such as Weiss and Smith, Taylor and Glezen or Davis (D-Base III+).

The predominant method of teaching these packages is by staff/outsider demonstration. Only three respondents ran computer workshops/laboratories either supervised by staff or outsiders.

All eleven of these respondents require computer assignments to be submitted by students, however only six respondents include this work as part of the students' assessment mark. The weights given to this work are 5%, 15%, 20%, 25% (2 respondents), and 40%. The lack of assessment may mean that many students may not be giving submitted work appropriate attention.

SOFTWARE PACKAGE USE AT UNIVERSITY OF WOLLONGONG

Two of the packages detailed in Table IV have been tried at the University of Wollongong: Pre-audit--Coopers and Lybrand and Weiss and Smith "Systems Direct Auditing Practice Case.

Experience with the use of a demonstration lecture of Pre-audit by an outsider, Frank Davlouros, an audit manager from Coopers and Lybrand, was extremely favourable. Voluntary student attendance was good, and the demonstration was appreciated by the students. Students received a hand-out detailing the tasks Pre-audit could do and a demonstration of its use in a real client situation. (The name of the client was removed for confidentiality reasons.)

Experience with student hands-on use of Weiss and Smith, "Systems Direct Auditing Practice Case" was less favourable. Comments received in a student survey conducted by the University's Centre for Staff Development criticised the case study for its "lack of resemblance to a real audit". Students were required to complete only two of the 10 assignments in the book (cash, and revenue and receivables) at unsupervised computer laboratory sessions. Most students took considerably longer to complete

this work than was suggested in the book. The submitted computer assignments were generally at a high standard with most students receiving good marks. It is not recommended to include a high percentage of marks to this material due to the difficulty of determining whether all students did their own work.

Our experience at the University of Wollongong, therefore favours the use of a package demonstration lecture of, for example, Pre-audit, in our one semester undergraduate auditing subject. A suitable mini auditing practice case has unfortunately not yet been found. An additional undergraduate "EDP Auditing" subject is presently being developed, however, the lack of a suitably designed major computer auditing practice case is an impediment to its introduction into our programme.

CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

The study provides evidence of the existence of similar failures in Australian undergraduate accounting programmes in the 1990's to that observed in the U.S.A. in the 1970's and 1980's.

Evidence is presented of institutional failure to meet the EDP knowledge requirements to be an auditor in the 1990's. This appears to apply to knowledge of EDP topics dealing with controls in different environments, steps in CAAT application, documentation of CAATs, and examples of the application of CAATs in tests of transactions and substantive tests of account balances.

Evidence is also presented of failure to include more practical application experience, especially in the audit of EDP systems and in the use of computers as an audit tool. Many students appear not to be gaining knowledge of the capabilities of available audit software packages, and even more appear not be gaining experience in the

hands-on use of such packages. Of those that do, the lack of inclusion of submitted computer assignments in the total students' assessment mark may mean that many students may not be giving such work appropriate attention.

The use of a package demonstration lecture, such as Pre-audit and/or student hands-on use of a well-designed computer auditing practice case could give students greater exposure to the practical aspects of conducting an audit in an EDP environment and enhance students' ability to function more effectively as entry-level auditors.

Further research is required into impediments to the introduction of required EDP knowledge and the inclusion of more practical application experience of software packages. An immediate priority is the development of more realistic Australian auditing practice cases for use in both one semester auditing subjects and separate EDP Auditing subjects.

	TABLE I		
	EDP Audit Topics Covered in Undergraduate Accounting Subjects		
		Freq	%
	The Impact of EDP on Accounting Systems and Related Controls		
1	The impact of EDP systems on auditors	24	100
2	Characteristics of EDP systems	23	96
3	Internal controls in EDP systems		
	- General EDP controls	24	100
	- EDP application controls	24	100
4	Controls in an on-line computer environment	17	71
5	Controls in a microcomputer environment	16	67
6	Controls in a database management		
	system environment	12	50
7	Controls in a service bureau environment	10	42
	Review and Evaluation of EDP Internal Controls		
8	Review of general and application controls	22	92
9	Preliminary evaluation of internal controls	22	92
10	Compliance testing of gen and applic controls	22	92
11	Final evaluation of controls	22	92
	The Use of CAATs as an Audit Tool		
12	Audit tasks performed by CAATs	21	87
13	Considerations in the use of a CAAT	20	83
14	Types of CAATs		
	-Audit software	19	79
	-Test data	20	83
	-Other CAATs	18	75
15	Steps in CAAT application	13	54
16	Documentation of CAATs	10	42
17	Examples of the application of CAATs in		
	tests of transactions and substantive tests		
	of account balances	15	63
18	Other EDP auditing topics		
	-Pre-audit	1	4

	TABLE II						
	Importance of EDP Audit Topics						
			Import.				
				Somewhat Import.			
						Unimport.	
		Freq	%	Freq	%	Freq	%
	The Impact of EDP on Accounting Systems and Related Controls						
1	The impact of EDP systems on auditors	19	83	4	17	0	0
2	Characteristics of EDP systems	13	57	9	39	1	4
3	Internal controls in EDP systems						
	- General EDP controls	23	100	0	0	0	0
	- EDP application controls	22	96	1	4	0	0
4	Controls in an on-line computer environment	13	59	7	32	2	9
5	Controls in a microcomputer environment	10	48	9	43	2	9
6	Controls in a database management						
	system environment	8	40	7	35	5	25
7	Controls in a service bureau environment	6	29	8	38	7	33
	Review and Evaluation of EDP Internal Controls						
8	Review of general and application controls	19	86	3	14	0	0
9	Preliminary evaluation of internal controls	19	86	3	14	0	0
10	Compliance testing of gen and applic controls	19	86	3	14	0	0
11	Final evaluation of controls	15	68	7	32	0	0
	The Use of CAATs as an Audit Tool						
12	Audit tasks performed by CAATs	16	73	6	27	0	0
13	Considerations in the use of a CAAT	14	64	8	36	0	0
14	Types of CAATs						
	-Audit software	11	52	10	48	0	0
	-Test data	11	52	10	48	0	0
	-Other CAATs	9	45	11	55	0	0
15	Steps in CAAT application	3	15	12	60	5	25
16	Documentation of CAATs	4	20	10	50	6	30
17	Examples of the application of CAATs in						
	tests of transactions and substantive tests						
	of account balances	13	65	5	25	2	10

Table III			
Mean Hours Spent Lecturing EDP Audit Topics			
(USA Mean Hours Spent on EDP Audit Topics)			
	Aust	**USA***	**USA***
		Acc	N.Acc
The impact of EDP on accounting systems			
and related controls	2.00		
Review and evaluation of EDP internal controls	1.48		
	3.48	1.89	1.57
The use of CAATs as an audit tool			
in an EDP environment	1.74	1.03	1.13
Total mean Time (hours)	5.22	2.92	2.70
% of total lecture time (USA total time spent)	20%	8%	7%
Internal control in an EDP environment		1.04	0.82
Audit implications of mini and micro computers		0.20	0.13
System flowcharting		0.50	0.52
Auditing advanced EDP systems		0.15	0.10
		1.89	1.57
Audit software package applications			
involving student use of the computer		0.33	0.28
Other computer auditing tools and techniques		0.32	0.40
Utilizing the computer for statistical auditing			
applications		0.38	0.45
		1.03	1.13
Total		2.92	2.70
* Adapted from Engle and Elam (1985), Table I pp.99-100			

TABLE IV			
Names of Audit Software Packages in Use			
	Involving:		
	Students and staff/outsiders		
		Students only	
			Staff/outsiders only
CARS	2		
D-Base III+	2		
Lotus123/VP Planner/Spreadsheets	2		
Audit Command Language (ACL)	1		
Expert System on Audit Report	1		
Integrated Data Extraction and Analysis	1		
SCAD	1		
Weiss and Smith "Systems Direct Auditing			
Practice Case"		1	
Taylor and Glezen "Case Study in Auditing"		1	
Pre-audit--Coopers and Lybrand		1	3
Craft Audit Sampling Assistant			2
KPMG--File Analysis Tool			1
	10	3	6
Number of institutions	8	3	3

REFERENCES

AAA Committee on Accounting Education and AICPA's Computer Education Subcommittee, (1974) "Inclusion of EDP in an Undergraduate Auditing Curriculum: Some Possible Approaches", The Accounting Review, October, Vol.XLIX, No.4, pp.859-865.

AICPA The Computer Services Executive Committee, (1979) "Audit and Accounting Guide: Computer-Assisted Audit Techniques", New York, AICPA.

Arens, A., Loebbecke, J., Best, P., and Shailer, G., (1990) "Auditing in Australia: An Integrated Approach" Second Edition, Sydney, Prentice Hall of Australia Pty Ltd.

Chambers, A., and Court, J., (1986) "Computer Auditing" Second Edition, London, Pitman Books London Limited.

Cohen Commission, (1978) "The Commission on Auditor's Responsibilities, Report and Conclusions and Recommendations", New York, The Commission on Auditor's Responsibilities.

Dawley, D., (1983) "What Auditors Should Know About Data Processing", Ann-Arbor Michigan, UMI Research Press.

Directory of Accounting Academics Australia/New Zealand, (1990), Brisbane, John Wiley and Sons.

Engle, T., and Elam, R., (1985) "The Status of Collegiate Auditing Education", Issues in Accounting Education, pp.97-108.

Gill, G., and Cosserat, G., (1989) " Modern Auditing in Australia" Second Edition, Brisbane, John Wiley and Sons.

Gul, F., Teoh, H., and Andrew, B., (1991) "Theory and Practice of Australian Auditing" Second Edition, Melbourne, Thomas Nelson Australia.

Institute of Chartered Accountants in Australia, (1989) "Accreditation Requirements for Tertiary Courses" Draft, September 11, Sydney, Institute of Chartered Accountants in Australia.

Jancura, E., (1975) "Technical Proficiency for Auditing Computer Processed Accounting Records", The Journal of Accountancy, October, Vol.140, No.4, pp.46-59.

Jancura, E., and Nance, J.,(1981) "Proficiency Levels for EDP Auditors", The Journal of Accountancy, February, Vol.151, No.2, pp.38-42.

Kanter, H., and Pitman, M., (1987) "An Auditing Curriculum for the Future", Issues in Accounting Education, Fall, Vol.2, No.2, pp.251-263.

Martin, J., and Whisnant S., (1982) "Why Johnny Can't Audit", The CPA Journal, November, Vol.LII, No.11, pp.10-17.

Nachmias, D. and Nachmias, C. (1976), "Research Methods in the Social Sciences", Edwards Arnold

Neale, A., and Hasseldine, J., (1991) "Issues in Professional Advanced Accounting Education: A Survey of Tax and Auditing Courses in Australia and New Zealand", Christchurch, Department of Accountancy, University of Canterbury.