1988

A Comparative Study of Accounting Information Systems Courses in Australia and the United States

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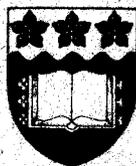*University of New South Wales*

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and LEGAL STUDIES

A COMPARATIVE STUDY OF ACCOUNTING INFORMATION
SYSTEMS COURSES IN AUSTRALIA AND THE UNITED STATES

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May 1988

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I. INTRODUCTION

The design of an information system, particularly that of computer-based information systems has an important role in accounting. The importance has been recently highlighted in a report by the Australian Society of Accountants' taskforce (1984), which asserts that "since accountants will be developing their own information systems, fundamental skills in systems analysis and design will become essential for all accountants". Most tertiary educational institutions are increasingly aware of the importance of Accounting Information Systems (AIS) as an academic subject, and do incorporate AIS in the undergraduate accounting curriculum[1]. This practice is consistent with the views of most writers specialising in the teaching of AIS, such as Nestman and Jackson (1978), and Schroeder (1972).

Despite the importance of AIS in the accounting curriculum, in Australia there is no published set of generally accepted AIS topics among accounting academics which should be incorporated in the teaching of an AIS course. This view is shared by a number of writers such as Wu (1983) and Davis (1976).

Four possible reasons for the lack of generally accepted set of AIS topics may be listed as follows:

(1) AIS, as a distinct subject, is a relatively new addition to the accounting course, compared to the "well-established" courses in accounting, such as cost accounting or financial accounting;

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1.   Writers such as Cerullo (1980) have discussed the role of AIS course, which is typically a one semester course in Australia, in the context of an overall accounting degree.

(2) current AIS textbooks do not provide a good guide to a list of topics that should be taught, they tend to cover different topics at different length;

(3) there is no officially published document from either the Australian Society of Accountants or the Institute of Chartered Accountants in Australia, which prescribes the content to be included in an AIS course offered by a tertiary institution, so as to meet the requirements of the professional accounting qualifications:

(4) the practitioners' views and expectations as to what should be taught in an AIS course are not readily available from public sources.

Accordingly, the objectives of this exploratory study are: (1) to ascertain the views of AIS practitioners and academics from universities and colleges of advanced education (CAE's) as to which topics should be included in the AIS course: and (2) to attempt to identify a common core of topics in the AIS course which should form the basis for the design of an AIS programme.

II. METHODOLOGY OF THE STUDY

This study was based upon an expert opinion survey. The survey took the form of a questionnaire mailed to all the universities and CAE's throughout Australia offering a major field of study in accounting. The survey sample consisted of experienced academics having overall responsibility for designing and teaching AIS courses, and from senior executives in all the "Big Eight" chartered accounting firms with extensive experiences in AIS analysis and design in the government, manufacturing, banking, retailing and other sectors. The respondents from these major accounting firms are designated as "practitioners" in this paper. These academics and practitioners are assumed to be AIS experts by virtue of their special skill and knowledge in the context

of this survey[2]. The questionnaire surveyed the opinions of AIS instructors as to which distinct topics should be taught in an AIS programme in Australian universities and CAE's[3]. After the replies were received and analysed, follow-up interviews were held with some respondents to further clarify the issues[4]. Other published sources such as handbooks of the institutions surveyed and journal articles were referred to in the analysis and reporting of the data.

The questionnaire focuses on a comprehensive list of 15 topics (listed in Table 2) extracted from a study in the United States reported by Wu (1983). Retention of the same list of topics for our Australian study as that used in the USA study should facilitate comparison of our data with the American data. These topics are also covered in most AIS textbooks[5].

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2. According to the Concise Macquarie Dictionary, an "expert" is a person who has special skill or knowledge in some particular field.

3. Respondents were asked which topics should be included in the AIS programme, rather than which topics were being taught in the AIS programme.

4. Only those respondents who have provided additional comments on the multiple choice questions in the survey were followed up with interviews.

5. Although some would regard these topics as forming largely the content of an "information systems" course, many other writers regard these topics collectively as falling within the distinct discipline of accounting information systems, e.g. Wu (1983a). Hicks and Leininger (1981), Leitch and Davis (1983), Li (1983), and Nash and Roberts (1984). In addition, although auditing is a relevant AIS topic, it is not included in our list of AIS topics, as it is generally considered as a specialisation in its own right. e.g. Birkett and Trotman (1986).

The respondents were asked to classify each topic according to whether it was considered to be a necessary, optional or unnecessary topic per se within an AIS programme[6]. The survey was preceded by a pilot run conducted among five AIS academics known to the authors.

A set of AIS topics considered to be "necessary" by the majority of all the respondents combined was then identified to be the core of topics in an AIS course to be used as a benchmark for developing an AIS course. This method of survey and identification of core topics based on the questionnaire approach were also adopted by Wu (1983).

III. RESULTS FROM THE SURVEY OF AIS TOPICS

The data of the survey were collated into the following four categories: (1) all respondents combined, (2) respondents from universities, (3) respondents from CAE's, and (4) practitioners. The method of analysis is similar to that in a paper by Gynther (1983). The questionnaire achieved a response pattern and rates as shown in Table 1.

Table 1: Response Rate of the Survey

	Questionnaires Forwarded	Questionnaires Returned	Response Rate (%)
Universities	17	11	64.7
CAE's	29	16	51.2
Practitioners	8	8	100.0
Total	54	35	64.8

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6. These topics were worded in the questionnaire in the same way as in Table 2. The description of each topic in the questionnaire did not contain more information than that in the Table.

The frequencies of "necessary", "optional" and "unnecessary" responses
for each topic in each of our four categories of respondents are
expressed as a percentage of the total respondents in that category in
Table 2.

In Table 2, percentages of the three types of responses in the similar
study conducted in the United States by Wu were calculated and tabulated
as a fifth category alongside the Australian results. The survey by Wu
was based on a sample size of 200 AIS instructors and the number of
instructors who had responded was 53 (a response rate of 26.5%).

Within each of these five categories, the first seven topics which
received a total percentage in excess of 45% for the "necessary"
response are ranked in descending order in Table 2. These rankings are
shown in brackets.

Similarly, within each of the five categories, the first five topics
which received a total percentage in excess of 40% for the "optional"
response are ranked in descending order in Table 2. These rankings are
also shown in brackets.

Table 2: Results of the AIS Survey

AIS Topics		Necessary (%)	Optional (%)	Unnecessary (%)
1. General system concepts				
	COM	88.57(3)	8.57	2.86
	UNI	75.00(4)	16.67	8.33
	CAE	93.33(2.5)	6.67	0.00
	PRA	100.00(1.5)	0.00	0.00
	USA	50.94(5)	9.43	1.89
2. System feedback and organizational control				
	COM	60.00	40.00	0.00
	UNI	58.33(6.5)	41.67	0.00
	CAE	73.33(7)	26.67	0.00
	PRA	37.50	62.50	0.00
	USA	26.42	15.09	3.77

3. Feedback control and accounting
   information system.

COM	68.75(6)	31.43	0.00
UNI	58.33(6.5)	41.67	0.00
CAE	93.33(2.5)	6.67	0.00
PRA	37.50	62.50(5)	0.00
USA	66.04(2)	7.55	1.89

4. Historical perspective

COM	17.14	57.14(4.5)	22.86
UNI	16.67	50.00	33.33
CAE	26.67	40.00(5)	26.67
PRA	0.00	100.00(2)	0.00
USA	13.21	30.19(5)	30.19

5. Data processing technology

COM	82.86(4)	17.14	0.00
UNI	83.33(3)	16.67	0.00
CAE	73.33(7)	26.67	0.00
PRA	100.00(1.5)	0.00	0.00
USA	52.83(4)	16.98	13.21

6. Business data processing systems
   including batch, real-time and
   distributed systems.

COM	94.29(2)	5.71	0.00
UNI	100.00(1.5)	0.00	0.00
CAE	93.33(2.5)	6.67	0.00
PRA	87.50(4.5)	12.50	0.00
USA	67.92(1)	5.66	9.43

7. System life cycle and resources
   management.

COM	97.14(1)	2.86	0.00
UNI	100.00(1.5)	0.00	0.00
CAE	93.33(2.5)	6.67	0.00
PRA	100.00(1.5)	0.00	0.00
USA	32.08	28.30	11.32

8. Study of internal control

COM	71.43(5)	25.71	2.86
UNI	66.67(5)	33.33	0.00
CAE	80.00(5)	13.33	6.67
PRA	62.50(7)	37.50	0.00
USA	62.26(3)	1.89	3.77

9. General-ledger and budgetary
   control systems.

COM	62.86(7)	28.57	2.86
UNI	33.33	50.00	0.00
CAE	73.33(7)	20.00	6.67
PRA	87.50(4.5)	12.50	0.00
USA	42.28(7)	26.42	9.43

10. AIS's for resources and feedback
    control (e.g. invoicing, A/R,
    inventory, cash disbursement and
    A/P).

COM	34.29	54.29	8.57
UNI	16.67	58.33(5)	16.67
CAE	60.00	33.33	6.67
PRA	12.50	87.50(4)	0.00
USA	43.40	24.53	0.00

11. AIS's for production control

COM	14.29	68.57(3)	14.29
UNI	0.00	66.67(3.5)	25.00
CAE	33.33	53.33(4)	13.33
PRA	0.00	100.00(2)	0.00
USA	47.17(6)	26.42	1.89

12. Strategic planning systems

COM	14.29	80.00(2)	2.86
UNI	0.00	83.33(1.5)	8.33
CAE	13.33	86.67(1)	0.00
PRA	37.50	62.50(5)	0.00
USA	16.98	41.51(1.5)	20.75

13. Financial planning and budgeting
    models

COM	54.29	42.86	2.86
UNI	33.33	66.67(3.5)	0.00
CAE	60.00	33.33	6.67
PRA	75.00(6)	25.00	0.00
USA	26.42	32.08(4)	16.98

14. Decision support systems

COM	40.00	57.14(4.5)	0.00
UNI	49.00	41.67	0.00
CAE	26.67	73.33(2.5)	0.00
PRA	62.50(7)	37.50	0.00
USA	16.98	43.40(3)	18.87

15. Information (communication)
    theory and information evaluation

COM	14.29	82.86(1)	2.86
UNI	16.67	83.33(1.5)	0.00
CAE	20.00	73.33(2.5)	6.67
PRA	0.00	100.00(2)	0.00
USA	13.21	41.51(1.5)	32.08

Notes:

(1) Where the responses (in %) to each topic do not add up to 100%, it
    is because not all respondents answered the question.

(2) COM = combined responses from universities, CAE's and practitioners
     UNI = responses from universities alone
     CAE = responses from CAE's alone
     PRA = responses from practitioners alone
     USA = responses from American institutions in Wu's Study

(3) The seven highest rankings of AIS topics deemed "necessary", in each of the above 5 groups were shown in brackets "(   )" (rankings are corrected for ties).

(4) The same ranking procedure as above is repeated for the five highest ranking topics deemed "optional" in each of the above categories of responses.

IV. ANALYSIS OF RESULTS FROM THE SURVEY OF AIS TOPICS

4.1 Comments on the Combined Results

The seven highest ranking "necessary" topics for the category of all the Australian respondents combined were identified. "System Life Cycle" was the most "necessary" topic in a typical AIS course. This topic encompasses systems initiation, design, implementation, and control. It serves as an overview of the various AIS applications such as systems for general ledger, accounts receivable, and inventory control. It also provides the basic knowledge for understanding the development of these AIS applications. While an accountant need not be an expert in areas such as systems analysis and design, he must at least be aware of the possible problems and solutions emanating from these areas.

Topics which are ranked as the second, third and fourth most necessary topics are "Business Data Processing", General System Concepts", and "Data Processing Technology" respectively. These topics, like "Systems Life Cycle", can be considered as foundation topics. Thus, they are prerequisite to the understanding of specific AIS applications.

The study of "Internal Control" is ranked fifth on the list. This is often thought to be a very relevant topic to accounting subjects, such as auditing and managerial accounting. The fact that internal controls are often designed around a system to prevent and detect errors or frauds reflects its importance in the consideration of an information systems design. Likewise, the study of "Feedback control in AIS" is ranked sixth.

The seventh ranking topic is "General Ledger System", which is an application of AIS. The percentage of "necessary" responses for all the respondents to the survey is 63%. The figure is very much higher than the corresponding figures for other applications of AIS, for example, AIS of resources (34%) and AIS of production control (14%). This may reflect the fact that the general ledger system is an important practical application of AIS design.

The top five ranking "optional" subjects are those which are neither required as prerequisite knowledge to the various AIS applications, nor considered as essential knowledge for the graduate. For example, the historical aspects of AIS was not considered to be a necessary part of the AIS curriculum, but only an optional subject. This may reflect the rapid pace with which technology advances.

4.2 Comparison of Results Between Universities and CAE's

Universities and CAE's did not appear to differ in their choice of topics in an AIS programme. Independently, these two groups of institutions considered "System Life Cycle" and "Business Data Processing Systems" to be necessary components of the course. They also shared similar views on which topics are optional or unnecessary.

The only difference seems to be that, collectively, the CAE's consider specific AIS applications such as AIS systems for general ledgers, accounts receivable and accounts payable should be taught in greater depth as separate topics. Whereas, the universities on the whole consider that it is not justified to treat these topics separately. In follow-up interviews, some university academics offered the reason that these topics are fairly narrow applications of AIS, and are therefore best treated in a cursory fashion under a more general heading such as "System life cycle".

Traditionally, it is often thought that courses in the universities would differ from CAE's in that they would be more oriented towards the "theoretical" aspects. Therefore, one would tend to think that views of the universities as to what should be taught may differ from those of the CAE's. However, the universities may wish to design their AIS programme to be in line with developments in the industry, rather than favouring topics that tended to expose the students to purely intellectual challenge. Furthermore, the universities may wish to increase the practical content of their course to be "competitive" with the CAE's in the job market for their graduates. On the other hand, according to several respondents in the follow-up interview, the curriculum of the CAE's in general has tended to move towards what is considered to be academically "rigorous" areas, by increasing their theoretical content. These considerations, taken together, may well ensure a gradual convergence of views between the Universities and the CAE's.

It is interesting to note that CAE respondents tended to classify more topics as being necessary (or less topics as being optional or

unnecessary) than their university counterparts. This can be seen by the fact that in nearly three-quarter of all the topics, the percentages of "necessary" responses for the CAE respondents are higher than their university counterparts. From our analysis of the course handbooks for universities and CAE's, it appears that CAE's, as a group, do not allocate more time to the AIS course than universities. Therefore, if the CAE's wish to cover more topics within the same amount of time, then they may well have to treat each topic, which they consider necessary, in less depth than what is normally the case in Universities.

4.3 Comparison of Results Between Academic Institutions and Practitioners

Some interesting differences emerged from the comparison of results between the academic institutions and the practitioners. Topics currently in vogue in the commercial world such as Decision Support Systems, and financial planning and budgeting models, which are considered by most of the practitioners to be necessary, are only considered by most of the academics to be optional topics.

Furthermore, the practitioners considered such conceptually based topics as "System Feedback and Organisation Control" and "Feedback Control and Accounting Information Systems" as being too academic and having little functional value. However, these topics are considered by university and CAE academics to be "necessary", as they provide prerequisite knowledge and the conceptual framework necessary to better understand the specific AIS applications.

Through our follow-up communications with the respondents, some practitioners expressed the view that the teaching institutions should be in the frontier of new ideas or new technology, and to include those

topics as necessary part of their AIS program. Other practitioners expressed the view that academia as an "ivory tower" is often out of touch with the real world in the industry and too slow to incorporate what should be regarded as a practically relevant topic in the course design. On the other hand, many academics expressed the view that they are reluctant to introduce "new" topics unless it is well proven to be of long term value. Topics which are considered in vogue at any one time may not withstand the test of time.

In general, these foregoing differences between the practitioners and academics are to be expected, and may be attributed to their different backgrounds or vested interests. The practitioners may be heartened to note that their views are appreciated and sought by most academics. as some academics put it: "AIS is a subject very much driven by the industry out there". However, it is felt by many practitioners that there is an inadequate level of communication between the academia and industry. This often results in academic institutions not teaching the "right" topics in order to equip their graduates for employment.

There is no response in support of any "unnecessary" topic among the practitioners. This may reflect a lack of understanding of the time constraint in a typically crowded AIS syllabus on the part of practitioners. However, in our discussion with the practitioners, the suggestion was made that, in the real world, a practitioner would have to possess a broad knowledge base, and could call on other technical experts to advise on more specialised aspects.

In our follow-up discussion with senior executives of the major accounting firms who are involved in information systems analysis and

design, some interesting comments were made. The following is a summary
of the comments on what they generally considered as an acceptable AIS
course:

(1)   they believed that topics such as accounts payable, accounts
receivable can be subsumed under the discussion of general ledger
systems. The main reason put forward was that the currently available
accounting packages for general ledger systems have improved
considerably in capability and normally contain those subsystems.

(2)   they generally considered that "Decision Support Systems" is an
important topic to be taught. This seems to reflect their interest in
applying the latest approach to their practice, and the increased
awareness among practitioners of its utility in solving problems in the
real world.

(3)   they stressed that the AIS course should be orientated towards the
management aspects of an AIS system, rather than details of the
technology in the AIS per se. The reason is that financial executives
are usually not required to have the same depth of knowledge in the
systems technology as the technical specialists.

(4)   they generally expressed the view that specialised knowledge such
as the AIS of production control is not relevant to most graduate
accountants.

4.4   Comparison of Results Between the Australian and American Studies

In comparing the top seven ranking topics from the Australian and
American studies respectively, it seems that the ranking of topics
considered to be necessary in the AIS course are broadly comparable.
However, if the five highest ranking topics only are considered, then an
interesting pattern emerges. The universities in America appeared to
consider that they should concentrate on the more general topics, such
as those involving basic concepts and tools in data processing systems
and technology, rather than the specific applications of these basic
concepts and tools to topics such as the analysis and design of
information systems, and systems for general ledgers and accounts
receivable.

Moreover, there is a wider spread of topics considered by the majority of respondents to be necessary in the AIS course in Australia than in America: nine out of fifteen topics were considered to be necessary by more than 50% of all the respondents in Australia, whereas that number of topics was only five in the American survey.

It is interesting to note that the American survey of necessary topics, the topic of production control systems as an application of AIS has a higher ranking (number 6) than other applications of AIS. such as AIS for general ledgers and AIS for resources. It is possible that this reflects the greater importance attached to the manufacturing industry in the American economy than in the Australian economy.

However. care must be exercised to avoid reading too much into the American study. Firstly, the response rate of the study is only 26.5% compared to 64.8% in our study. Secondly, the combined percentages for the "necessary", "optional" and "unnecessary" responses on some AIS topics decline to less than half of the total number of respondents in that survey.

V.   SUMMARY AND CONCLUSION

We believe the results of our survey provide a useful basis for drawing up the contents of an AIS course, and a benchmark against which the appropriateness of an existing AIS course topic may be verified.

The following topics are considered by the majority of the respondents in our survey to be the necessary topics, and therefore are recommended to form the core of an AIS programme:

1. System Life Cycle
2. Business Data Processing Systems
3. General Systems Concepts
4. Data Processing Technology
5. Study of Internal Control
6. Feedback Control and Accounting Information System
7. General Ledger and Budgetary Systems

In summary, this survey has thrown some interesting light upon the

development of AIS in Australia:

(1) Respondents to our questionnaire survey are categorised into
several groups. The list of topics considered to be most necessary in
the AIS course by these various groups are broadly similar. The degree
of similarity in the list of necessary topics between the universities
and the CAE's appears to be very high. But the degree of similarity is
much less between the academic institutions and the practitioners. The
probable reasons for this situation are discussed above; and

(2) The topics considered by the respondents in this study to be
necessary in the AIS course are broadly similar to those in the American
study carried out by Wu (1983).

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