Management Accounting in Education: stakeholder perceptions in Singapore

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Abstract

Management Accounting in Education: stakeholder perceptions in Singapore

One of the functions of the educational manager is to manage the limited resources of the educational organisation. Management accounting has been used in industry and commerce and is also seen as one of the important tools for allocating resources and improving the efficiency and effectiveness of educational institutions.

The most common techniques used are: (1) accounting information, (2) budgeting, (3) variance analysis, (4) decentralisation, cost/profit centre, (5) unit cost, and (6) ratio analysis.

It appears that there is a lack of systematic management accounting in Singapore educational institutions. The research is focused on the extent of the application of the above techniques to Singapore educational institutions and the attitudes of the senior management of these institutions towards the effectiveness of these techniques.

The study confirms that there is still a lack of systematic management accounting systems in Singapore educational institutions, even though there is generally a wide application of these techniques and most senior administrators think that they are useful for their work and would like to have training in using them.

The evidence supports this researcher’s proposal of implementing a Model of Finance in Singapore Education (i.e. an integrated management accounting system) to replace the current conventional system. The proposed Finance model consists of: (1) an effective costing and pricing system; (2) a standard cost system; (3) a Financial Analysis Model, which builds a computerised reporting system allowing integrated analysis for school level to district and cluster level accounting; (4) a budget handbook, a handbook on techniques for guidance; (5) training; (6) a balanced scorecard system for measuring school overall performance; and (7) engagement of the professional bursar to relieve the principal's accounting responsibility.
The study is one of the first studies of this kind in Singapore. It is hoped that the study will give future researchers in management accounting a new frontier for inquiry.
Abbreviations
Abbreviations

ABC  Activity Based Costing
CIMA  The Chartered Institute of Management Accountants
CQI  Continuing quality improvement
CRV  Cost-Volume-Revenue
DCF  Discounted Cash Flow
FAM  Financial Analysis Model
FTE  Full Time equivalent
FTES  Full Time equivalent students
IM  Instruction Manual
IRR  Internal Rate of Return
KPI  Key performance indicator
LFM  Local Financial Management
LMS  Local Management of Schools
MOE  Ministry of Education
MBE  Management by exception
NPV  Net Present Value
PSLE  Primary school leaving examination
SBM  School Based Management
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Introduction
Chapter 1

Introduction

Managing resources

One of the functions of the educational manager is to manage the limited resources of the educational organization. The term "Resources" here are broader than financial resources. For resources, Caldwell and Spinks (1992) include knowledge, technology, power, materials, people, time and finance as resources. Finance is most important, because it provides the means to secure the other resources such as human resources of teachers and material resources of building and equipment required delivering high-quality teaching and learning. It is the combination of human and material resources that determines the quality of education to be provided to students (Coleman, Bush and Glover, 1994). Laine, Greenwald and Hedges (1996), in their studies concluded that 'resource variables such as pupil expenditure show positive strong and consistent relations with (student) achievement', and 'resource variables that attempt to describe the quality of teachers show very strong relations with student achievement' (Laine, Greenwald and Hedges, 1996, quoted in Coleman and Anderson 2000, p.3). Financial management is significant primarily because it determines the extent and nature of these resources (Coleman, Bush and Glover, 1994).

In the past, the government has funded most schools. During the 1990s, many countries modified their educational systems to give greater autonomy to schools and educational institutions. This development is evident in Australia, Canada, New Zealand, the United States and the United Kingdom (Coleman, Bush and Glover, 1994). In Singapore, some schools have been converted to autonomous schools or independent schools, giving them more power to manage their own affairs (Gopinahan, 1997). This international trend towards self-managing schools and colleges serves to accentuate the importance of effective financial management.

The educational institution as an input and output system

The educational institution is an input and output system, in which resources input, are transformed into educational output. Schools and educational institutions provide the
inputs of human and material resources to deliver educational activities and processes. These activities lead to certain outputs or outcomes, which should be consistent with the school's educational objectives (Coleman, Bush & Glover, 1994). There are problems in defining educational outputs and outcomes because many of them are intangible (Preedy, Glatter and Levacic, 1997). In many non-profit organisations, it is difficult to have a good quantitative measure of outputs. For example, a school can easily measure the number of students graduated, but it cannot measure how much education each of them acquired. The extent to which educational objectives are achieved will depend on the efficiency and effectiveness of the input-output system. A school should be efficient and also effective if it achieves these objectives at the lowest possible cost (Anthony and Herzlinger, 1989).

The Importance of Management Accounting Techniques

Management accounting has been promoted and used in industry and commerce for more than forty years. It is believed that management accounting is an effective tool for using accounting data and other information to manage the organisation to achieve its objectives in the most efficient way. This technique has also been applied to non-profit organisations like schools.

Management accounting techniques are useful for resource management. Techniques like cost-benefits analysis, break-even analysis, are useful to assess the benefit of an activity as well as its costs. A technique like budgeting is a tool for strategic planning, coordination, control and motivation. Costing, marginal costing, return of capital and discounted cash flow are applicable to resource allocation. Setting up profit centres and cost centres are pattern of decentralisation and devolution of control of resources. There are also many evaluation techniques, such as variance analysis, ratio analysis and performance indicators. Variance analysis is the means by which planned activities are compared with actual results, which provides information for managerial action. Ratio analysis describes significant relationships, which exist between sets of figures; it also assists management to assess the characteristics of trends. Performance indicators cannot give a full picture of the school operation, but they can give some indication of how well the school is proceeding towards its objectives. This can also be applied to non-financial performance measurement.
Management accounting: a tool for managing resources

The province of management accounting is to provide information for internal management planning and control. School managers are more concerned with drawing upon relevant techniques from management accounting than those of stewardship accounting (Levacic, 1989). Batty (1970, p.3) said that management accounting is the term used to describe the accounting methods, systems, and techniques which, coupled with special knowledge and ability, assists management in their task of achieving the organisation's objectives. According to the Chartered Institute of Management Accountants (CIMA 1996), management accounting in practice involves the following core activities:

1. Participation in the planning process at both strategic and operational levels. This involves the establishment of policies and the formulation of plans and budgets, which will subsequently be expressed in financial terms.

2. The initiation of and the provision of guidance for management decisions. This involves the generation, analysis, presentation and interpretation of appropriate relevant information.

3. Contributing to the monitoring and control of performance through the provision of reports on organisational and organisational segment performance, including comparisons of actual with planned or budgeted performance, and their analysis and interpretation.

Generally, the researcher's definition of the scope of management accounting techniques covered the following techniques. These are: use of accounting information for decision making, budgeting, setting up a cost centre and profit centre, costing, cost analysis, unit cost analysis, standard costing, marginal costing, project (program) evaluation, capital expenditure evaluation, breakeven analysis, ratio analysis, return of capital, discounted cash flow (DCF), activity based costing and so on (adapted from CIMA, 1996).
The Singapore Education System

At present, there are 193 primary schools; 147 secondary schools, including 18 autonomous schools; eight independent schools; 14 junior and two centralised pre-university institutions. In addition, there are three universities and four polytechnics excluding various technical and commercial training institutions. Government schools and Government-aided schools are fully funded by the Government, while the independent schools are only partially funded; the school raises the remaining funding. Independent schools receive an annual per capita grant equivalent to the current cost of education in other government/government-aided schools. The boards of governors of individual schools have to raise the remaining funds from fees, alumni and other sources. Each individual school decides its own fee schedule. In the past, there was a high level of centralisation. To respond to the globalization of the world economy, it has been decided to decentralise authority, giving more authority to school principals, to encourage schools to opt out of the government system and go independent, and to create a number of autonomous schools within the government sector itself (Goh, 1985).

Management accounting in Singapore educational institutions

The government accounting system has a great influence on the accounting system for government or government-aided schools. The Singapore Government accounting service defined management accounting as follows:

(1) Budgeting and budgetary control - to prepare the budgets in accordance with Ministry budgetary policy and objectives, to monitor the budgeted expenditure and revenue and to alert management of projected shortfalls in time for appropriate action to be taken;
(2) Monitoring performance indicators - with strong emphasis on results and the use of incentives to maximise efficient use of public resources, to work closely with line managers to help identify and monitor the performance targets of the organisations;
(3) Costing - to review the costing structure to ensure that government services are priced according to prevailing policy, to monitor and ensure that Ministry achieve their cost-recovery ratios (Government of Singapore, Accounting Service at the
In spite of the Singaporean Government’s definition of management accounting on its accounting service website, from the researcher’s observations, management accounting does not manifest itself in educational institutions in Singapore. As a result, school principals and their managers do not have appropriate financial data to enable them either to manage their current budgets effectively or to plan for the future. There is still a lack of management accounting in Singapore educational institutions. There is inadequacy in the present system.

The present accounting system in Singapore educational institutions

At present, for Government Schools, the Ministry of Education centrally handles most of the accounting functions. Teacher’s salaries and major expenses are centrally administrated. The Ministry of Education does not provide summarized and analytical information to schools principals and administrators. The inadequacy of the present system is described in the following aspects:

Lack of accounting information

One of the major problems is that the principal does not have all financial information. For government schools, financial information such as staff-cost and utility cost are not provided to the school principals. Even where this information is available, it is not prepared in a form which is easily used for decision making. Costs are not properly classified and defined which make the comparison of accounting information among schools difficult. Principals also view financial information as confidential. They tend not to share it with other principals. Therefore principals do not use proper accounting information for making decisions. This makes planning recurrent budget difficult because of the incomplete accounting information.

Lack of understanding of the purpose of budgeting

Budgeting is an important part of the management processes and functions. It is an instrument of planning control and motivation (Davis, 1994; Arnold and Hope, 1989), but
many Singapore principals still do not understand the purpose of budget preparation. They do not view the budgetary system as an integrated set of project and programme decisions covering the organisation as a whole and each of its many parts for a specific period.

At present, for Government schools, budget preparation is an annual requirement and some principals view it as a routine administrative chore, while others think that it is a tool to ask for more funds. As the principals are not accountable for the profit and loss of the schools, principals do not focus their efforts on the income aspect and cost efficiency. What they are concerned with is whether they have enough budget provision for their legitimate spending because any expenditure over the budget may require explanation and approval. To avoid spending over the budget, it is common for them to provide a budgetary slack, which represents a degree of padding over the estimated budgeted expenditure. When preparing the manpower budgets, they are concerned more in terms of number of heads required for each category of staff rather than the cost of each category of staff. Therefore, without appreciation for the purpose of budget preparation, the budget prepared by these principals are not useful for future planning and decision making.

**Lack of costing structure**

Decentralisation of resource management derives from the belief that there are limits to the decision-making capacity of the senior managers in an organisation. In Singapore, many schools do not set up responsibility centres like cost centres or profit centres for allowing responsible officers to react speedily to any changes in their own area of responsibility and to allow corrective action to be taken. Without proper structure of costing, it is difficult to make planning accountable to the responsible officer.

**No proper costing system**

Cost information is like any other data. It needs to be organised into a pattern before its significance can be understood. The cost data of a school can be arranged in numerous ways so as to bring out different features, such as direct cost, variable cost, fixed cost and overheads.

In Singapore, cost information in schools is not properly collected and classified into meaningful categories such as variable cost, fixed cost and overheads. There is no
standardized cost classification. Even if the cost is classified, the principal may not understand the classification. It makes data comparison among schools difficult and misleading. Without standardized cost classification, planning for cluster of schools activities is difficult.

**Absence of data bank**

The cost information for schools is not shared among them. The data in one school may not be used for comparison with that in other schools. There is no common data bank available for school principals to tap on for decision making. It is difficult to obtain information beyond the school site level such as cluster level, district level and state level. Since the Ministry of Education has grouped schools into clusters, the financial information is useful for the supervisor of cluster schools for decision making. It makes planning through tapping the past costing information from other schools difficult.

**Absence of standard costing system**

The standard cost is predetermined cost; it should serve as a benchmark for efficiency comparison. In Singapore, standard costing system is not properly set up to facilitate preparation of budget. Very few schools in Singapore make use of the standard costing system for budget preparation, for guiding pricing and costing a course and for making purchase decisions. Since there is no yardstick for actual cost comparison in Singapore, most principals prepare school budgets based on historical costs. Therefore it makes planning recurrent budgets difficult.

**Principals do not have management accounting knowledge**

Most principals learn their accounting skills on the job. They do not receive formal training. The Instruction Manual is the only guideline for them. Furthermore, management accounting is not a subject for teacher’s training nor a subject for the training of school administrators. This causes principals to face difficulties in planning recurrent budgets. Therefore, principals and school administrators should receive adequate management accounting training so that they are competent in using the techniques, or at the very least, do not resist the use of these techniques.
Given the above observations, it seems that there is a lack of management accounting and adequate financial information in Singapore schools/educational institutions. It is not surprising that there appears to be a poor understanding of management accounting by principals and school administrators.

**What are the supposed benefits for schools/educational institutions and those who work in them from the adoption of such a system in full?**

If a rigorous process of management accounting system was adopted in Singapore schools and if adequate financial information was available, then the following benefits are likely to accrue.

1. The full management accounting system would assist educational management in coordination, strategy planning and resource management. The system would provide proper accounting information for senior managers or principals for making decisions. The information is used for three purposes: (1) as a basis for coordinating and controlling the current activities of the organisations. (2) as a basis of evaluating operating performance of an organisation and (3) as a basis for program evaluation (Anthony & Herzlinger, 1989).

2. If a proper costing system is set up, costs are properly classified and defined which make the comparison of accounting information among schools easy. The cost data of a school can be organised into a pattern, which can be understood. With the proper structure of costing, school resources would be priced according to prevailing policy, and monitored to ensure that schools will achieve their cost-recovery ratio. Proper responsibility centres like cost centres or profit centres would be set up for allowing information, along with other cost information, to be summarized and analysed. This information would be available to principals for decision making.

3. A proper budgetary system is useful for strategic planning, coordination and expenditure control. The budget is a tool for planning the activities that can lead to the
achievement of educational objectives. It provides an opportunity to express the aims and curriculum of the school or college in financial terms. A good budget-setting process will align financial considerations with the priorities outlined in a school’s strategic plan. The use of budgets is integral to (1) the planning process (2) the control process (3) a device for motivation (Arnold and Hope, 1989).

4 A proper application of management accounting techniques would assist in allocating resources, improving the efficiency and effectiveness of educational institutions. These are the applications of the common techniques:

1. Using accounting information to make decisions.
2. Using budgetary system for planning, control, coordination and linking to organisational objectives.
4. Using decentralisation and profit /cost centres for resource allocation and responsibility identification.
5. Using unit cost and unit income for pricing and costing.
6. Using ratio analysis for data analysis.
7. Using other management accounting techniques to monitor resources for management decision making.

**Purpose of the research**

In view of the above discussions, two vital research questions arise: -

1. What is the present situation in Singapore schools/educational institutions with respect to the adoption of such an accounting system? How much management accounting is presently being implemented?

2. What are the supposed benefits for schools/educational institutions and those who work in them from the adoption of such a system in full?
The research problem

Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is the research problem addressed by this thesis.

Therefore, the research focus is on:

Management accounting in education: stakeholder perceptions in Singapore

The research will be focused on the extent of the application of management accounting in the educational institutions of Singapore and the attitude of the senior management of these institutions towards the effectiveness of management accounting as a management tool. Since accounting information and statistics are normally considered as confidential, the author's study will not involve these aspects. The educational institutions include all schools, junior colleges, centralised institutes, technical education centres, special schools, foreign system schools, commercial schools, tutorial schools, polytechnics and universities. The total number of educational institutions is about one thousand.

This study will seek to answer the following research questions

(1) What is the extent of application of management accounting techniques in Singapore educational institution?

(a) What is the extent of using accounting information to make decisions in respect of:
   - Control expenditure?
   - Cash flow planning?
   - Evaluation of performance and profitability?
   - Determination of whether to start a new class or a new programme?

(b) What is the extent of using a budgetary system in respect of:
   - Planning and control?
   - Coordination of all departments?
Linking organisational objectives?
A means of asking for additional funding?

(c) What is the extent of using variance analysis to:
   Explain the difference between the actual and budget?
   Control expenditure and highlight problems?
   Monitor performance by standard costing?

(d) What is the extent of using decentralisation and setting up profit /cost centres for:
   Resource allocation?
   Expenditure control?
   Responsibility identification and innovation?
   Revenue accountability?

(e) What is the extent of using unit cost and unit income for:
   Pricing and costing?
   Cost control and decision making?
   Evaluation performance and efficiency?

(f) What is the extent of using ratio analysis?

(g) What is the extent of use of other management accounting techniques:
   Marginal costing?
   Breakeven analysis?
   Returns to capital?
   Cost apportionment?
   Discounted cash flow?
   Activity based costing?
   Direct cost, variable cost, fixed cost and overheads?
   Performance indicators?

(2) What is the attitude of the senior managers or principals towards the usefulness of the various aspects of the following management accounting techniques?
What is the attitude of senior managers or principals to:
(a) Using accounting information?
(b) Using a budgetary system?
(c) Using variance analysis and standard costing?
(d) Using decentralisation and profit/cost centres?
(e) Using unit cost and unit income?
(f) Using ratio analysis?
(g) Using other management accounting techniques?

(3) Would senior managers or principals find management accounting useful for their work?

(4) Are senior managers or principals willing to have training on management accounting techniques?

At the end of the study, these findings may help the researcher to explore how far and to what extent a workable model of finance in Singapore education is used in Singapore schools. This workable model would overcome the shortcomings of the current situation, especially the inadequacy of costing structure, costing system and unavailability of database for financial analysis.

Since the cost information for the current system does not organise into a pattern before that significance can be understood by senior managers or principals. This workable model would provide a proper costing and pricing system at site level. The cost and pricing information would be structured according to the organisation’s requirement and organised into a pattern to be understood by senior managers or principals.

There is no benchmark for efficiency comparison for the current system. A standard costing system is not properly set up in Singapore schools. This workable model would set up a standard costing system to serve as a benchmark for efficiency comparison and facilitating budget preparation for schools.

There is no common data bank available for school principals to tap on for decision-making. This model would set up a database for cost analysis in districts, cluster and school level. This is to overcome the present situation where schools/educational institutions lack information on the financial, budgetary and cost situation for decision-making.
As most principals do not receive formal training on management accounting techniques, the research would establish the degree of competency of management accounting knowledge and the extent of a supportive attitude of the senior managers or principals. This is to establish the requirement of providing suitable management accounting training and guidance to managers or principals so that they are competent to use the system.

Conclusion

Management accounting has been promoted and used in industry and commerce for more than forty years. It is believed that management accounting is an effective tool for using accounting data and other information to manage the organisation to achieve its objective in the most efficient way. This technique has also been applied to non-profit organisations like schools. From the researcher’s observation, management accounting does not manifest itself in educational institutions in Singapore. Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is the research problem addressed by this thesis.

The researcher would like to empirically verify the above understanding and wants to establish the extent to which this technique is used. The success of applying this technique is also dependent on the attitudes of school administrators towards the techniques. The study would also find out the attitudes of senior management of these institutions towards the effectiveness of management accounting as a management tool. The topic selected for research is worthwhile, important and relevant because adopting management accounting would provide information on the financial, budgetary and cost situation of the schools/educational institution for senior managers or principals in decision-making. The benefits of the management accounting would be discussed in Chapter 2.

At the end of the study, the research findings might help the researcher to explore how far and to what extent a workable model of finance in Singapore education is used in Singapore schools to establish how far a workable model of finance in Singapore education this would overcome the shortcomings of the current situation, especially the inadequacy of costing structure, costing system and unavailability of database for financial analysis. The
research also seeks to establish the requirement of a benchmark for efficiency comparison, and the requirement of training and guidance to the senior managers and principals.
Chapter 2

Literature Review
Chapter 2

Literature Review

Introduction

Management accounting has been widely used in United Kingdom and other countries as a management tool for resource management and improvement in efficiency and effectiveness. This technique has also been applied to non-profit organizations like schools. In Singapore, the Government accounting service has stressed the importance of management accounting for resource management in respect of: (1) Budgeting and budgetary control (2) Monitoring performance indicators (3) Costing review (Government of Singapore, Accounting Service at the Ministries, Jan 2000). However, from the researcher’s observation, management accounting does not manifest itself in educational institutions in Singapore. School principals and their colleagues do not have appropriate financial data to enable them either to plan or to manage school resources effectively. The Singapore educational institutions have not obtained the benefits of adopting the full management accounting system.

The literature review will seek to establish how far a full management accounting model is worth adopting, especially the likely outcomes and benefits for schools or institutions in adopting the full management accounting system. The literature review will also establish what the main features are of the workable model in Singapore; how far the workable model in Singapore is applied in educational institutions and what evidence, if any, there is that a workable model is developed in Singapore educational institutions. Therefore a thorough literature search on the field of management accounting, educational organisation, resource management, efficiency and effectiveness is necessary. Moreover, a thorough literature search for the various management accounting techniques and its practical application to educational institutions is also made. The search shows that most of the literature is from the United Kingdom and the United States. There is very little literature on the application of management accounting in Singapore institutions.
What is Management Accounting?

Management accounting involves the following set of core activities:

1. Participation in the planning process at both strategic and operational levels. This involves the establishment of policies and the formulation of plans and budgets, which will subsequently be expressed in financial terms.

2. The initiation of and the provision of guidance for management decisions. This involves the generation, analysis, presentation and interpretation of appropriate relevant information.

3. Contributing to the monitoring and control of performance through the provision of reports on organisational (and organisational segment) performance, and their analysis and interpretation (CIMA, 1996).

These activities have included all the activities defined by the Singapore Government accounting services. In addition, management accounting is also useful for strategic planning and policies establishment.

Batty (1970, p3) gave a wider definition. He said that management accounting is the term used to describe the accounting methods, systems and techniques which, coupled with special knowledge and ability, assist management to achieve the organisation's objectives. Management accounting primarily serves the needs of internal management; it is relatively free from many of the restrictions which are imposed when presenting information to outsiders. It is also free to extend beyond the boundaries of accounting. The "special knowledge" may refer to the practice of management, economics, finance, statistics, operational research, law or other disciplines as necessary in providing accounting and financial information that assist management to achieve the organisation's objectives (Batty, 1970). Therefore, management accounting is more than just providing financial information. Since 1995, management accounting's role has moved away from the data analysis, evaluation of financial plans and budgets, focusing on the strategic and emphasising both financial and non-financial aspects. The key areas of activity include performance management, information management, and corporate
governance, supply chain management and financial management (Management Accounting: Terminology, 2000).

The supposed benefits of adopting Management Accounting system in full

The first part of accounting is for a stewardship purpose, to serve the needs of users outside of the organisation. The main interest groups are the school’s creditors and stakeholders. Stewardship accounting is concerned with fulfilling the legal requirements that annual company accounts are published and that the organisation’s transactions are audited to ensure the probity of its managers and other employees. Public sector organisations, like schools and colleges, have legal requirements to publish accounts of their use of public funds and to conduct audits. The second function of accounting, management accounting, is to provide information and systems for internal management planning and control. Providing the information and systems, which enable managers to plan and control the organisation’s activities, is the province of management accounting (Levacic, 1989).

Main features of an effective management accounting model

As mentioned in the earlier chapter, in an effective management accounting model, the cost and pricing information should be structured according to the organisation’s requirement and organised into a pattern to be understood by senior managers or principals. There should be a system of benchmarks for efficiency comparison and facilitating budget preparation for schools. Above all, the model should provide appropriate financial data to enable school principals and their managers to manage their current budgets effectively or plan for the future.

The main features of an effective Management accounting model are addressed in the next section.

Management accounting assists educational management, coordination and strategy planning
Educational management is a field of study and practice concerned with the operation of educational organisations. Glatter (1979, p.16) claimed that management is concerned with the “internal operation of educational institutions, and also with their environment.” Management accounting system would fulfil this role by providing the required information for school management’s decision-making.

Hoyle (1981, p.8) claimed that “it (educational management) is a continuous process through which members of the educational organisation seek to co-ordinate their activities and utilise their resources in order to fulfil the various tasks of the organisation as efficiently as possible”. In management accounting, budgetary system performs the function of coordination.

Strategic planning is a key management process, drawing together institutional values and goals, and providing the framework for the development of quality and the deployment of resources. Strategic planning also provides the basis for translating decisions into actions in a proactive, rather than reactive way. This entails looking at the medium and longer-term direction of the organisation (Preedy, Glatter and Levacic, 1997). Strategic planning requires a high level of information on educational policy, resources, workloads and also information from the community, which the school is seeking to serve. Schools will need to generate information about the options available to them (Cooper & Lybrand, 1989). Management accounting system would fulfil this role by providing the required information for school management’s decision-making. Good strategic planning is essential if schools are to make effective use of their available resources and avoid financial difficulties. Educational purposes cannot be achieved unless appropriate resources are made available at the right time. It is particularly important to link strategic planning with budgetary process (National Audit Office, 1977) where budgetary process is one of the important techniques of management accounting.

*Management accounting provides feedback to Educational Organisations*
The organisation is a complex living organism, which interacts with its environment. It is a purposeful entity producing outputs, which it exchanges with stakeholders in its external environment in return for resources and support. The process of converting input resources to output are mediated by internal processes of elements such as the technology of the organisation's productive processes and culture of its human relations. Appropriate feedback mechanisms between the organisation, its environment and within the system itself are required for the organisation to be responsive and adaptive (Mogan, 1986 and Hanna, 1997). Management accounting system is one of the feedback mechanisms.

Management Accounting assists Educational Organisations in Resource Management

Management accounting assists educational organisations in resource management. Resource management is broader than financial management. Caldwell and Spinks (1992, p.5) defined the term 'resources' broadly to include knowledge, power, materials, people, time and finance. Finance is only one of many resources in education. Finance refers to the money available to purchase real resources. Finance is particularly significant, because it provides the means to secure the other resources required for delivering high-quality teaching and learning. Financial management is significant primarily because it determines the extent and nature of these resources.

Schools and colleges provide the inputs of human and material resources. These combine to deliver educational activities and processes. These activities lead to certain outputs or outcomes, which should be consistent with the school's educational objectives. The process of resource management in schools and colleges can be conceptualized as a four stage cycle: acquiring resources; allocating resources; implementing the resource allocation decision; evaluation and review (Levacic, 1993). Budgetary system is one of the management accounting techniques useful for resource allocation.

Efficiency and Effectiveness

Schools and colleges provide the inputs of human and material resources. The extent to which educational objectives are achieved will depend on the efficiency and
effectiveness of the input-output system. A school should be efficient and also effective if it achieves these objectives at the lowest possible cost (Anthony and Herzlinger, 1989). Thomas (1990 p.5) defined efficiency as ‘aiming to produce the desired output in the cheapest possible way, the concern is with how efficiently the education system is achieving the objective it sets itself’. An efficient use of resources is one which produces a given quantity or value of output at least cost. Effectiveness is the relationship between a responsibility centre’s outputs and its objective. Knight (1993, p.19) defined effectiveness as ‘the fullest possible attainment of the goals and objectives of the school’. Effectiveness is also the extent to which an intended outcome is achieved (Audit Commission, 1984).

Management accounting techniques, like cost benefit analysis, breakeven analysis and performance indicators may help senior managers or principals in efficiency and effectiveness management. One limitation is that only benefits and costs which can be expressed in quantitative or monetary terms, are easy to measure and analyse.

The nature and effectiveness of the management accounting model

In order to establish the main features of an effective management accounting model, it will be easier to establish from the effectiveness of the management accounting techniques which are commonly used in educational institutions. From the literature review, the researcher found that the following management accounting techniques are commonly used in educational institutions: Accounting information (Levacic, 1989), Budgeting (Davis, 1994), Variance analysis (Arnold and Hope, 1989) and Standard costing (Levacic, 1989), Decentralisation (Stewart and Holtham, 1989), Cost centre/profit centre (Knight, 1993; Tomkins and Mawditt, 1994), Unit cost /unit income (Carr, 1997), Ratio analysis (Betty, 1970). As to the other management accounting techniques, these techniques are not commonly used; senior managers or principals only used them when need arises. They are marginal costing, breakeven analysis (Knight, 1993), return to capital (Betty, 1970), cost apportionment (Knight, 1993; Groves, Pendendalebury & Newton, 1994), discounted cash flow (Shin, Segel and Simon, 1996), activity based
costing (Carr, 1997), direct cost, variable cost (Davis, 1994) and performance indicators (Fitz-Gibbon, 1989).

Let us now look at the main features of the effective model in respect of these techniques:

**Why is accounting information useful for decision-making?**

Senior managers or principals will be handicapped in school decision-making if they are unable to obtain accounting information to make decisions. Accounting information is used for:

*Controlling Expenditure*

In an educational institution, accounting information reports are required for control of expenditure, evaluation of capital expenditure projects, planning of cash flow requirement, evaluation of performance and decision-making. Hence school managers use variance analysis, unit cost, ratio analysis techniques to help them to generate, to analyse, to present and to interpret relevant information. (Levacic, 1989). This relevant accounting information assists senior managers or principals to control expenditure.

*Cash flow planning*

Cash flow is important accounting information because it is a measure of when money is spent even though cash flow is not strictly a costing factor. Most sophisticated financial planning in educational organisations will allow cash flow to be matched with peak financial demands such as replacement costs, which tend to bunch rather than being spread evenly (Davis, 1994). For ideal cash flow management, schools would have all excess funds invested in secured investment and be liquid when funds are required (Bauer, 1995). Cash budget is one of the main budgets; it provides a generalised view of the cash flow demand (Gross, 1996).

*Evaluation of performance and profitability*

For an ideal management accounting system, accounting information, along with other information, is summarized, analysed, and reported to those who are responsible for
knowing what is happening in the organisation. These reports essentially compare planned data on inputs and outputs with actual data on inputs and outputs. They are used for three purposes: (1) as a basis for coordinating and controlling the current activities of the organisations, (2) as a basis of evaluating operating performance of an organisation and (3) as a basis for program evaluation (Anthony & Herzlinger, 1989).

**Determination of whether to start a new class or a program**

Accounting information is a basis for program evaluation (Anthony & Herzlinger, 1989). Accounting information on cost-effectiveness analysis allows for comparison of alternative goals or programs (Knight, 1993). Therefore accounting information will assist senior managers or principals to decide whether to start a class or a program.

**Why is a budgetary system useful for planning, control, coordination and linking to organisation objectives?**

**Budgetary system is useful for planning and control**

The budget is a tool for planning the activities that lead to the achievement of educational objectives. It provides an opportunity to express the aims and curriculum of the school or college in financial terms. A good budget-setting process will align financial considerations with the priorities outlined in a school’s strategic plan.

The budget is an important part of the management cycle. Shillinglaw (1980, p.136) said “Budgeting is an integrated set of project and programme decisions covering the organisation as a whole, and each of its many parts for a specific period.” The budget is a plan expressed in monetary terms (Anthony and Herzlinger, 1989). It is one of the four steps in the formal management control process: programming, budgeting, operating (measurement) and reporting analysis. It is also an integral process. The use of budgets is integral to the planning process and the control process. It is a device for motivation (Arnold and Hope, 1989). There are two approaches to budgeting: Rational Budgetary Approach and the Political Budgetary Approach (Davies, 1994). School managers or principals can adopt the approaches best fit to their schools or institutions environment.
In the rational approach, the budget is used as an instrument of management planning. Starting with the setting of objectives, decision-making will need to cover all aspects of school activities through the preparation of detailed budgets and operating plans, the monitoring of progress and achievement, agreement of changes and finally a review of annual performance. The operating plans and budgets developed at this stage should contain proposals with estimated costs for the curriculum and extra-curricular development and training, building and grounds maintenance.

School principals or senior managers may adopt one of the three rational approaches (a) output budgeting, (b) zero-based budgeting, and (c) multi-year-time-horizon in their budgeting processes.

In output budgeting, the focus is on outputs rather than on inputs. Expenditure should relate to output rather than being characterized by a list of resource inputs, which relate directly to fulfilling the objectives of the organisation. In zero-based budgeting, there is a need to justify all expenditure. All expenditure items at every period are subjected to searching scrutiny (Wildavsky, 1978). This involves taking a fresh look at expenditure by starting with a ‘clean slate’ rather than by basing decisions on previous practice. The multi-year-time-horizon approach abandons annual financial planning in favour of multi-year financial planning. The rational approach is predicated on the assumption that the decision-making process proceeds in orderly stages. However, techniques such as programme budgeting and zero-based budgeting may be too demanding in terms of the resources needed to collect and analyse the necessary data and to use it for decision-making. Rational techniques have to be tempered by organisational constraints and political realities that present unique features in each institution (Simkins, 1989). The rational approach is more suitable for Government schools or institutions where the decision-making process proceeds in orderly stages.

Budgetary system is useful for coordination of all departments

There is need for a link between educational objectives and the resources allocated to achieve those objectives. The budget makes possible the achievement of these objectives (Glover, 1997). Strategic planning can be considered as a framework
with forward budget plans. When top management decides on the strategic programs that the school should pursue, it has allocated all of the organisation's human, technological, and financial resources that are available for internal development. This allocation influences the strategic budgets that may be requested at each level in the organisational hierarchy. The strategic budgets, together with the operating budgets of the various organisational units, are consolidated and sent up for top management approval. When top management finally approves the budgets of the various organisational units, the strategic implementation process is set into motion. Midcourse corrections to the prior year's budget can have an impact on the formulation of the current year's budget. If the actual accomplishments fall short of the strategic budget, the negative variance may suggest the managers failed to implement its chosen strategy efficiently (Chakravarthy and Lorange, 1991).

*Budgetary system is useful for linking to organisational objectives*

The organisational process approach of budgetary system emphasises that there are a number of factors which organisations pursue to achieve corporate objectives. Organisations try to balance these factors with the achievement of set objectives in order to ensure harmony. In budgetary terms, the management may prefer to produce a budget that keeps the main interest groups and constituencies of the organisation happy rather than being involved in radical solutions, which dissatisfy key stakeholders. Thus, the organisational process approach would suggest that an acceptable solution is one which satisfies the different goals and objectives in an organisation rather than to take the most efficient approach (Davies 1994). In practice, for organisational approach, there are two types: centralised budgeting, decentralisation(delegated) budgeting.

*Centralised Budgeting*

In a centralized system, a single body makes decisions; for resource allocation, there is no delegation of virement powers to the departments and all proposals to switch expenditure between heads require the agreement of the centralized body. The budgeting approach is the traditional historical/incremental one (Crisp 1989).
Decentralisation (Delegated) Budgeting

In decentralisation, a cost centre manager is responsible for a financial budget, cost control of that budget and for the effective application of the resources controlled in that budget. Decentralized resource management is a managerial response to the problem of bureaucracy. It retains the basic structure of organisational hierarchy, but moves certain decisions to the lowest possible level (Steward and Holtham, 1989).

The use of budgetary system is integral to the planning process. Managers or principals can adopt the approaches which are suitable to their schools or institutions environment for controlling expenditure; coordination of activities of all departments and to ensure harmony for achieving corporate objectives.

The human side of budgeting

During budget preparation, senior managers or principals should consider the human factors which influence the budgetary system.

Budget is an attempt to allocate resources through the political process. If politics is regarded as conflict over whose preferences are to prevail in the determination of policy, then the budget records the outcomes of this struggle. If organisations are viewed as political coalitions, budgets are mechanisms through which sub-units bargain over conflicting goals, make side-payments and try to motivate one another to accomplish their objectives (Wildavsky, 1974). There are factors (incrementalism, micro-political forces, organisational process) that influence the traditional budgeting processes (Davies, 1994). For incrementalism, the largest determining factor of the size and content of a year’s budget was the previous year’s budget. There is no significant attempt to reassess existing patterns of expenditure; attention is given to minor adjustments. Marginal changes in the budget occur so that a fluctuating or disjointed pattern of change occurs around an unchanging central core (Wildavsky, 1974). In the past, in the UK, local authority budgets and institutional budgets have been incremental but in the early 1990s, through the pressure of resource restraints, they show evidence of zero-based influences while retaining strong elements of incrementalism.
For micro-political forces, Greenwood et al. (1980, p.29) said, "A department’s share of scarce resources depends upon the skill of its advocates in the use of essentially political tactics, such as knowing how much to bid for, how far to pad estimates, how far to over/undersign, how to ‘read’ the political climate, how to generate and utilize public support”. Therefore, the people involved in managing the budgetary process would influence the budgetary decisions.

Managers or principals should be aware of these approaches, so that they may minimize conflicts among departments in the budgetary process.

**Why is a budgetary system motivational?**

All budgeting processes involve relationships between people. Thus budgeting entails behavioural change. Budgeting is a device for motivation, and better performance can be expected from employees if they have some say in the construction of the budget to be used to evaluate their performance (Arnold and Hope, 1989).

**Why is budgetary slack a human problem for the budgetary system?**

Budgetary slacks represent a degree of padding introduced into budgets so as to guard against possible failure to attain targets. Slacks exist within even the most efficient and well-run organisation. By discouraging slacks, the budgetary system should emphasize that the budget should be attainable under normal working conditions; participation by individuals with detailed knowledge of the problems is likely to increase the realism of budgets (Arnold & Hope, 1989).

**Why is budgeting a means for asking for more funds?**

*Asking for More Funds*

Budgeting process is a dynamic one with competing forces vying for funds to meet differing expenditure needs (Wildavsky, 1974). Wildavsky (1974, p.xxiii) provided a useful perspective on this:
"Human nature is never more evident than when people are struggling to gain a larger share of funds or to apportion what they have among myriad claimants”.

Budgeting is also a bidding system, which involves set criteria to enable bidders and decision-makers to assess priorities (Bush, 2000). Hence budgeting is a means for asking for more funds.

Why are other non-traditional budgets useful?

Besides the traditional budgeting process explained above, there are other budgeting practices used for unusual situations. Programme budgeting, Programme linked budgeting (PLB) and budgeting basics in algebra are examples of the other types of budgets. These budgetary systems are useful for senior managers or principals in educational management for application in special situations.

Programme budgeting is a package of inter-related budgets. These are constructed in line with (a) the organisational structure and managerial responsibilities, (b) the organization’s major products and its services programme (Birch, 1989).

As to Programme Linked Budgeting (PLB), the distinctive feature is its relationship to the planning process. In simple terms, it seeks to establish the desired outcomes of programmes and prepares budgets to those outcomes. As such, it is output based, participatory and transparent. Programmes may be as large or as small as desired, from primary education to an institution’s departmental programme; likewise they may be cross-sectional, cross-disciplinary (Brock, 1996). The programme linked budgeting system is helpful to senior managers or principals for the planning of the educational programme.

Budget can be prepared by means of basic algebraic calculation. This involves cost-sharing of indirect costs. School principals or senior managers who understand these algebra calculations for indirect costs, fringe benefits, and cost-sharing are in a better position to prepare their own budgets, and most of them will appreciate the time savings
and the self confidence. These methods are able to focus on more complex problems of research administration (Claycamp, 1996). It also gives the senior manager or principals a systematic way of preparing their budgets.

**Why is variance analysis useful to control expenditure, highlight problems and monitor performance?**

Variance analysis is useful in explaining the difference between the actual and the budgeted, highlight problems and monitor performance. The difference between budgeted and actual performance is termed ‘variance’. Variance is the difference between a planned, budgeted or standard cost and the actual cost incurred. The same comparisons may be made for revenue. The generation of variances provides the feedback, which entitles us to term the whole process a control system. Variance accounting is a method of accounting, by means of which planned activities (quantified through budgets and standard costs and revenues) are compared with actual results, which provides information for variance analysis. This is the evaluation of performance by means of variances, whose timely reporting is for managerial action. Variance analysis relates to the technique of “Management by Exception’ where management information is only really required on areas where the plan is not being achieved. Variance analysis is a skill of interpretation. This is an important management tool for senior managers or principals to highlight problems and interpret data (Arnold and Hope, 1989). For example, Townsley used a budget control model to prevent deficits for enrolment-dependent colleges. He had made a case study for Wilmington College in Delaware on how to reduce the deficit. He recommended that variance analysis should be used as a reference for improving the budget and the control model (Townsley, 1994).

**Why is standard costing useful for monitoring performance?**

Standard costs are carefully predetermined costs, they are target costs; costs that should be achieved under efficient operations. Standard costs provide a framework for gauging performance, for building useful budgets, for guiding pricing, for meaningful
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product costing. Cost control depends on a set of standards as a frame of reference, which outlines how a task should be accomplished and how much it should cost. As work is done, actual costs incurred are compared with standard costs to reveal variances. The variances are investigated to discover reasons. Through this process, management can take the appropriate action. The main uses of standard costs are in performance measurement, control, stock valuation, establishment of selling prices, and cost allocation. The use of standard costing would promote horizontal equity by helping to ensure that like pupils have similar amounts of resources allocated to them. Standard costing systems are widely used because they provide cost information for many purposes such as: prediction of future costs, setting of challenging targets, a device for budgeting and control. Hence standard costing is useful for monitoring performance (Drury, 1999).

**Standard Costing Facilitates Formula Funding for Schools and Colleges**

To estimate the standard cost of educating a mainstream student, in a given age band in a school or college of efficient size, the standard cost is built up by considering each item of expenditure in the budget line by line. These line items are teachers, supply cover, ancillary staff, care-taking, cleaning, energy, water and maintenance (Levacic, 1989). Therefore standard costing facilitates formula funding for schools and colleges.

**Why is costing system useful?**

Costing, the process by which an organisation’s costs are determined, is a useful strategic planning and management tool available to educational institutions. The rationale for doing costing is clear. Decision-making will occur when administrators understand (1) the origin of cost incurred by their organisation; (2) have information relevant to judging operational efficiency, evaluating comparative performance, and deciding among various resource allocation and reallocation strategies and (3) understand how to make optimal use of various sources available for funding their organisation. Costing is useful to institutions attempting to justify a reduction of resources in units experiencing enrolment declines and the reallocation of these resources to growth sectors. Further, costing not only enables a school to identify where it may be more efficient, it
also critically enhances an institution’s self-awareness by illuminating its educational philosophy and priorities (Ahumada, 1992).

**Costing information**

Costing information can improve performance and control costs. Using better information on school costs and efficiency would free more resources for innovative projects, especially those targeted to improve student performance (Hanushek, 1994). An institution should introduce cost saving measures all the time. A country does not have to wait for an economic crisis in order to introduce cost-saving measures in education (Psacharopoulos and Pawda, 1993).

**What are the benefits of effective costing and pricing in educational institutions?**

The application of good practice of costing and pricing will supply the relevant data to support management judgement and decision-making (Davis, 1994). Educational managers should consider the following four stages when undertaking a costing activity:

1. There must be a clear identification of the project being costed and of the items to be costed. It is very important to identify the cost components at the outset of the project.
2. Deciding on the approach and the measurements used is critical. Judgement about the time frame and scale of the operation to be costed is critical in affecting the success of the approach.
3. The collection and analysis of costing data has to take place.
4. Careful consideration needs to be given to the presentation of results. The nature of the audience will determine the complexity and detail of the report.

**Why are decentralisation, cost centre/profit centre useful?**

There has been a radical shift from centralised to decentralised systems of educational finance in the United Kingdom. The belief in the benefit of decentralised institutions has been developed in the United States, Canada and New Zealand. Decentralised institutions have a number of advantages:
First, they are far more flexible than centralised institutions; they can respond quickly to changing circumstances and customers’ needs. Second, decentralised institutions are more effective than centralised institutions. Third, decentralised institutions are far more innovative than centralised institutions. Fourth, decentralised institutions generate higher morale, more commitment, and greater productivity. As a result of these changes, unit managers are (i) closer to the client (ii) better able than more remotely sited managers to identify the needs of the clients and to satisfy these needs (iii) know the best and most efficient combination of various resources for production requirements and satisfying the clients’ needs (Steward and Holtham, 1989).

Why are unit cost and unit income useful for pricing and costing, control, decision-making and evaluation performance?

Unit cost can be used for budgeting and accountability by means of the optimum unit cost. Unit cost seeks to measure the cost of the output. Outputs are related to objectives or purposes in term of products or services. Control is to ensure actual unit cost was lower than budgeted unit cost (Jones, 1989).

For education, average costs are often called unit costs and are the cost of providing for each student. Unit cost = total cost /number of units. Average costs are made up of both fixed and variable cost so even when more variable costs are being incurred, average costs will continue to fall until it is necessary to pay more fixed costs. For example the falling average cost will continue until the optimum point is reached and then, if a second set of equipment is needed, additional fixed costs will be incurred and average costs will increase. Unit costs are valuable and often essential for cost comparison, across years or between schools. These will usually be costs of inputs, normally under budget heads like teacher salaries, electricity etc. A unit cost is sometimes preferred as a measure of resource impact. Cost per student, per student-hour or cost per class are useful ways of studying educational activities. Their principal value is that they are a limited link between inputs and outputs taking into account the economy
of scale. This can be used for comparison among alternative ways of carrying out an
activity. The operational aim of management is to minimise the unit cost (Jones, 1989).

Unit cost data is essential for pricing products and services, measuring the relative
profitability of products and services and establishing measures of efficiency, but unit
costs do not measure the quality of provision, simply the efficiency of provision. The
difficult management task is to meet unit cost targets while holding or improving quality
targets. All colleges unit cost systems must be aligned with a system of quality
performance measures so that trends and changes in both can be measured on a course by
course basis (Carr 1997).

**Why is unit cost useful for setting targets and monitoring performance?**

Optimum unit cost, the minimum unit cost that one can reasonably be expected to
attain, need to involve all staff in the professional task of setting targets and measuring
actual performance against them. Agreements about optimum performance parameters
are established through negotiation between the principal and each head of department
individually. The involvement represented by meaningful consultation and the
mechanisms of accountability are accomplished by teachers assessing the work of those
in other parts of the college so that there is a sense of corporate responsibility for the
performance of the college (Jones 1989)

**Profit Centre**

The objective of a profit centre accounting system is to identify where surpluses and
deficits are being made within the university and also to give schools a greater degree of
independence over their financial affairs. A profit centre structure has the following
disadvantages: (1) The problem of total institution co-ordination and viability. Problems
may arise in providing acceptable transfer prices for goods and services provided
between profit centres. The exact form of profit centre inter-relatedness depends much
upon the nature of those businesses and their technology and the required management
style. (2) Dividing up the institution into profit centres gives rise to increased functional
supported costs. (3) Profit centres could develop into local selfishness and conflict as
each segment manager strives to show the best possible segmental results instead of confronting external challenges.

The conditions under which a profit centre structure is more likely to be successful are: (1) the profit centre business must be largely separable, with revenues and costs not dependent upon each other. (2) There must be enough competent general business managers to head up the profit centres. (3) There must be adequate information and financial control support at divisional level. (4) Top management (at group level) must have a clear commitment to the profit centre philosophy and not interfere with local management (Tomkins and Mawditt, 1994).

Why is ratio analysis useful for data analysis?

Ratio analysis is the technique for interpreting information by comparing one item of statistics with another item. It is only a guide and must be used in conjunction with other information of comparable nature (Betty, 1970). For senior managers or principals, numerous ratios can be employed to compare efficiency of a school’s operation.

The usefulness of the other management accounting techniques

The earlier discussion is concerning the main features and effectiveness of the seven management accounting techniques commonly used in educational institutions. Now let us look at the other important techniques that may not be used for all educational institutions, but are useful for senior managers or principals for educational management. For example, marginal costing, break-even analysis, return to capital, cost apportion, discounted cash flow, activity based costing.

Why is marginal cost useful in deciding whether to start a class or a programme?

The marginal cost is the cost of taking one extra student or reducing a group by one student. This is a significant costing factor and relates closely to the concept of threshold level of expenditure. If a new class has to be created, the marginal cost will certainly exceed marginal revenue and may lead to a decision not to admit the extra student. Marginal costing is the accounting system in which variable costs are charged to cost
units and fixed costs of the period are written off in full against the aggregate contribution. Its special value is in recognising cost behaviour, and hence assisting in decision-making (Davis, 1994). The marginal costing principle is useful for course evaluation, and for decision of which products or services should be proceeded with or discarded (Burnett, Smith and Siberstein, 1994).

**Why is break-even analysis useful for deciding whether to start a class or a programme?**

Break-even point is the level of activity at which total revenues and total expenses are equal, there is neither profit nor loss. It can be ascertained by using the breakeven chart or calculation. Schools may use break-even point technique to improve the “acceptability” of fees. This may make a higher level possible, using devices such as “extra charges”. The model allows the break-even class size to be compared with the average class size; if the average class size is greater, a surplus is generated (Knight, 1993).

**Why is return to capital useful?**

The return of capital is a technique used to calculate the return of purchasing a capital item like buying new premises or equipment. It is used for making decisions such as whether to rent or buy new premises by comparing the return of each alternative action.

**Why is apportion and reallocate cost useful?**

Cost can be classified into prime cost, subsidiary cost, fixed cost and variable cost. In order to ascertain a more accurate costing for an educational activity or programme, subsidiary cost of a support centre and fixed cost should be apportioned and included in costing for an educational activity or programme (Knight, 1993). Management accounting assists educational management by providing such information.

*Prime and subsidiary cost*
Prime costs relate to the school's educational function while subsidiary costs refer to support functions. Teacher salaries are prime costs, while transport and catering are subsidiary costs. This is a useful distinction, between resources related to a school's prime educational function and those relating to its subsidiary administrative, transport and catering functions (Knight, 1993).

**Fixed Cost**

When assessing the nature of costs, it is necessary to distinguish between those costs that the decision-maker can adjust quickly, and those that take a longer time to impact upon. Fixed costs remain unchanged in the short term despite fluctuations in the level of activity. For example, the cost of the permanent building and the loan interest associated with them (Davis, 1994).

**Variable Cost**

Variable cost can be adjusted quickly and changes as activity increases or decreases. For example, extra students in a classroom require more books, stationery, examination fees and supply teachers (Davis, 1994).

**Total costs and economies of scales**

Total costs are a combination of fixed costs and variable costs. The total costs increase as more students are taught; they increase less than proportionately. This is because fixed costs stay the same and only the additional costs are the variable costs. The fixed costs are spread over more students and become a smaller part of the cost associated with each individual student. Thus economies of scale occur until capacity cannot increased any further and a new series of fixed costs have to be incurred (Davis, 1994).

**Cost Absorption transfer**

Cost absorption transfers the total cost of academic centres and in some cases support centres to the cost unit using absorption rates. Typically, an absorption rate for an academic centre will be calculated using planned taught hours. The budgeted direct costs
of the academic centre plus the apportioned costs from support centres is divided by the programmed teaching hours for the academic year. This calculation provides an hourly teaching rate which, if applied to the courses or units to be measured will result in the absorption of the total cost of the centre. For fixed cost like teaching accommodation is apportioned on the basis of actual usage of teaching rooms by the course (Groves, Pendendlebury & Newton, 1994).

**Why is discounted cash flow useful?**

Discounted cash flow (DCF) techniques are the methods of selecting and ranking investment proposals such as the net present value (NPV) and internal rate of return (IRR) methods where time value of money is taken into account (Shin, Segel and Simon, 1996). The school administrators require proper training in order to be proficient in using the technique.

**Why is activity based costing (ABC) useful to monitor the resources of schools/institutions?**

Activity based costing (ABC) has in recent years made inroads into service industries, and lately into public sector organisations, including education. Activity-based costing is a cost accounting method that measures the cost of resources, processes, and overheads associated with a prescribed activity. Activities are the pieces of the operational whole, the steps necessary to produce an end product or services. ABC begins by defining a school in terms of its vital part or key activities. In ABC, it is necessary to identify the cost driver. The term "cost driver" applies to any factor which causes a change in the cost of activity, e.g. the quality of a course required, may affect the resources required. An activity can have multiple cost drivers associated with it. These are activities that convert inputs (resources, materials, people and technology). Activity Based Costing (ABC) seeks to link indirect costs, such as support centre costs, to the cost unit through the use of activity relationships. In other words educational processes are viewed as giving rise to support activities such as enrolling a student, paying an invoice,
issuing a library book etc. while the activities themselves give rise to indirect costs (admissions, finance, library). Once the nature of the activity relationship is identified, then indirect costs are apportioned on the basis of a cost per activity, such as cost per enrolled student, cost per accounting transaction, cost per library request, and so on. (Carr 1997).

More universities are using management accounting and activity-based costing

Activity based costing is a useful management accounting technique for senior managers in higher education. In UK, several universities are using Activity-based Costing (ABC) accounting. ABC can help not only with tighter financial management, but also with the total quality management in higher education, there is significant potential for using the data generated by ABC system in assessing the productivity and costs of various activities in campus and for deciding on strategic changes.

ABC may overcome the shortcomings of traditional accounting

One of the major obstacles both to college reports on their operations and to restructuring, reallocations, and strategic initiatives is the lack of cost accounting in educational academies. Traditional accounting in higher education is designed to track budget compliance, which directs the administrators’ focus to total expenditure within a particular budget or cost pool. At the University of Manchester, administrators began a partial application of ABC principles, primarily to overhead costs. This produced information about which faculty groups operated at a surplus and which did so at a deficit. This has led to new strategies to eliminate the deficit balances over the next five years. For better use of resources, departments began releasing unused space to avoid overhead charges. The study shows that ABC can help not only with tighter financial management and resource allocation, but also with total quality management or continuing quality improvement (CQI), and with assessments and strategic planning. (Gordon and Charles 1998). Grove, Pendlebury and Newton (1994) also made a study for introducing activity based costing to Cardiff University in addition to traditional fund accounting. The project has pinpointed a number of areas of weakness in Cardiff
University's financial procedures and revealed a clearer picture of how the total costs of an university can be decomposed over various categories of activity by applying ABC.

**ABC assists in Course Costing**

Howson and Mitchell (1995) made a study of the course costing in several institutions. The study concluded that at the departmental level, ABC and related methods are keys to understanding cost behaviour. This is an important check on institutional policies, and also a necessary yardstick to ensure cost-effectiveness of central services. At the institutional level, ABC and related methods are critical to an overall understanding of cost behaviour. Based on this knowledge and of the institutional goals, policies on top-slicing and cost allocation can be devised, which will influence relevant departments to steer towards these institutional goals.

In the past, management accounting in universities has been a relatively neglected area. It is only recently in response to the significant changes in teaching and research funding that developments and initiatives have begun to emerge. Financial problems in American Colleges and Universities made it worthwhile to adopt improved planning and control techniques (Berry, 1994 and Bourn, 1994). Likewise, in U.K., the accounting systems in many universities were oriented toward ABC costing.

**Shortcomings of ABC**

Morgan (1993) used activity based costing to overcome the shortcomings of conventional costing. He found that ABC has the following shortcomings: (1) it cannot deal with all overhead costs, only a proportion of the costs. (2) Costs such as audit fees; directors' salaries and board costs cannot be allocated to products in a better way than the conventional costing method. (3) The implementation of ABC can cause significant personnel problems as it challenges the departmental structure. (4) It can be a difficult exercise and fail to motivate – especially when significant benefits cannot be initially identified. (5) It is a new idea and will generate in some a resistance to change. (6) As “cost-drivers” cause cost, budgets need to be structured to give “cost driver” detail so those managers can control the drivers and deal with improvements (Morgan, 1993).
Why are direct cost, variable cost, fixed cost and overheads allocation useful to monitor cost?

Cost classification will provide costing data of meaningful significance to senior managers or principals. Costing is concerned with determining the specific costs of an educational activity, often focusing on providing data relating to the viability of competing activities. Cost should be classified according to its nature in terms of direct cost and indirect cost. The cost classification is the key factor in the costing process. Cost can be classified in the following categories.

Direct and indirect cost

Direct costs are those which can be identified with the sub-unit within the school or colleges. Indirect costs (or overheads) cannot be traceable to the sub-unit. In practice they are apportioned and allocated to the sub-unit by arbitrary formula (e.g. number of students). Under this category there are inclusions such as the time of supporting staff, accommodation, electricity bills and overhead expenditure. Direct cost relates to expenses incurred in student contact, course management and the provision of teaching accommodation. Contact hours are derived from identifying the length of teaching time associated with a course. Non-contact hours are related to specific hours engaged on managing a cost. This is calculated by taking the average cost of lecturer multiplied by the number of hours, which are allowed for course management activities.

As mentioned earlier, cost also can be classified into fixed cost and variable cost. There is no one absolute and correct way of costing. Comparisons of costing of dissimilar activities may be difficult. There are a number of methods that can be employed to alter the costs of an institution’s learning environment. A change in the total quantity of factors in the costs of instruction will alter total costs, other things being equal. Cost will change if there is a change in the prices paid for factors in the learning environment. Costs could be reduced if low-priced factors are substituted for high-priced factors. One of the major issues of large concern to decision-makers is that when such a change is made there will be wide ranging effects on the quality of education or the reputation of
the academic organisation. A meaningful interpretation of college and university costs may be carried out only if it is based on a thorough understanding of the learning environments provided by the college or university. (Fielden and Pearson, 1989)

**Why are performance indicators useful to evaluate performance?**

Performance evaluation is an assessment of how well an organisation is doing. For education, it is more complex than the commercial analogy because the lines of accountability are more diffuse. Government and local community can influence schools and colleges. There is no clear line of hierarchy and accountability. The outputs of schools and colleges are multidimensional and difficult to quantify. The scope for ambiguity is great (Fitz-Gibbon, 1989). In schools, because of the difficulties of precise measurement, performance indicators are used. However, performance indicators cannot give a full picture of the school operation, but they provide advance warning of areas where management attention may be required. They can also give some indication of how well the school is proceeding towards its objectives. Beside performance indicators, internal auditors for academic performance audits provide a valuable and cost effective support system for institutional decision-making (Chamberlain, Gordon and Plunkett, 1994). Internal audit unit is a valuable resource to help them measure performance. Internal auditors are in the best position to assist administration at all levels of a university in accomplishing the stewardship function objectively. Through the execution of performance audits, internal auditors can provide support and counsel to administrators seeking strategies to improve programmes and to initiate total quality management (TQM).

In the earlier section, we have established the main features and effectiveness of the other management accounting techniques. Although they are not used for all educational institutions, they are equally important. Senior managers or principals may apply these techniques for educational institutions when the need arises. In the next section, we will examine the main features and benefits of adopting management accounting from the experience in other countries in order to ascertain the possible benefits for Singapore educational institutions.
What is the experience of management accounting used in other countries?

In the past, government had funded most schools. During the 1990s, many countries modified their educational systems to give greater autonomy to schools and educational institutions. This development is evident in Australia, Canada, New Zealand, the United States and the United Kingdom. "School-based management" is the term for decentralised school management used in North America (particularly in USA). In UK, schools have moved from a government-centralized control system to school-based management and local financial management. The local management of schools is referring to the school-based management in U.K. In the researcher’s view, both of these systems are some forms of school management accounting. They are examples of the experience for management accounting system used in these countries:

**School Based Management (SBM)**

The key elements for school-based management are described below:

The stakeholders to whom decision-making power and responsibility are decentralised. The management domains (e.g. finance, staff and curriculum) over which decentralised power can be exercised. There is form of regulation, which controls what the local decision-makers have discretion over and how they are held to account for their decisions and actions (Levacic, 1995).

School based management assists senior managers or principals in school management in the following aspects:

**Cost savings due to direct control over the use of resources**

This site-based management collectively allows its programme in the individual school communities to have a direct input into the designed use of resources allocated to school. The school has more savings, and the success of the programme is attributed to the participants' ability to see the tangible results every month of savings in the expenditure (Myers, 1997).
Make Decisions Quickly and Effectively

School based management occurs where schools received a lump sum transfer of funds. In the event where schools receive the lump-sum fund, schools can make decisions quickly, without going through layers of bureaucracy. They use their limited education funds more effectively and the use of school-based budgets provides a more complete picture of how funds are spent (Neal, 1994).

Greater Accountability and Efficient Purchase

In school based management, there is greater accountability for the use of funds. Funds carry-over is allowed and more funds are focused on instructional matters. When schools have their own budgets, they are allowed to purchase goods and services directly from the private sector, and there is more promptness in delivery of services. This improves the choice of goods and services; reduction in waste and more immediate price guide for teachers (Neal, 1994)

Local Financial Management (LFM)

In UK, schools have moved from a government-centralized control system to school- based management and local financial management. The local management of schools is referring to the school-based management in U.K. The Local management system is commonly known as the local financial management (LFM).

LFM Improves Control and Increases Efficiency in Schools' Use of Resources

Financial delegation gives schools more day-to day control over their budgets. LFM has resulted in marked improvements in the managerial role of the Head and the Governing body (Thomas, 1988). Teaching staff are more closely involved in the running of school and the client position is closely in focus so that the school is the purchaser of services in a relatively free market economy. Furthermore, the formula funding is a pupil-driven system of funding, school tied to pupil number as an incentive for schools to attract and retain pupils (Harrison, 1987)
Chapter 2

The School Head Plays a Bigger Role in Management

The principal is given greater autonomy and the autonomy improves their potential as school managers. Decisions are made by people in the best position to judge. It improves the quality of education. Furthermore, the heads’ role gains the natural extension of facility to implement management decision and development of delegated budgets (Sweet, 1988). However, heads need to acquire new and different skills and knowledge to implement LFM. In order to do this job properly, they need some limited knowledge of accountancy and budgeting, additional negotiating skills, and information about the market in which they are placing contracts (Streatfield, David & Robert, 1988). On the other hand, it may cost more even if initiated as a cost saving scheme. It is spending flexibility that decreases with the size of the school, plus the fact that there is a watershed below which autonomy would just not be worth running (Harrison, 1987).

Brings Schools closer to the Client

LFM brings the clients position of schools closely into focus so that the school is now the purchaser of services in a relatively free market economy (Tuck, 1988). From the above examples, it seems that other countries like U.S.A. and United Kingdom are only applying management accounting to a limited extent, rather than the full management accounting system. However, these schools have benefited for the application of management accounting model. Now let us examine how the management accounting model has been applied at universities.

Management Accounting in University

From the literature, the researcher found that more universities in U.K and U.S.A. are using management accounting and activity-based costing in spite of their problems of cost allocation, cost apportion and overheads recovery. However, these are management accounting techniques which are used in university in order to provide senior managers more accurate information for decision-making.
The Devolution in a University

Due to the change of environment, the university has to change its' structure and processes which are influenced by its need to shape a strategy which responds to the environment in which it operates, so that it can match its environment to grasp opportunities. The university will formulate more informed strategies of resource acquisition and allocation. The traditional centrally managed funding system is likely to be replaced by a devolved managerial control system and structure. Faculties have extensive resources and responsibilities. This is within a university retaining a central policy group with extensive carefully delineated responsibilities; a number of central staff responsible for establishing technical standards, monitoring, and advice; and with established mechanisms by and through which overall university policies may be implemented. These are means by which the organisational integrity of the university can be maintained in the face of the centrifugal forces tending towards fragmentation in a highly devolved system (Bourn, 1994). This indicates that university has to use more management accounting techniques in order to match its environment to grasp opportunities.

Budgeting in Universities

Budgeting is an important management accounting technique for financial planning, securing and use of funds in university. University budget estimates should provide for all functions within university systems. Such functions include teaching, research, administration and various activities incidental to or arising from them. All these functions owe their origins to one common variable, which is the student population: that is students are directly or indirectly related to, and associated with, the university functional budget estimates. They form the base for budget estimates and the starting point for estimate preparation. In ascertaining student population, there are the (1) head-count method, and (2) full time equivalent (FTE) counting method. The student head-count method is the common chronological system. The student (FTE) method counts students in relation to the departmental level of activities measured by the number of teacher-student contact hours within each department (Murthy and Rao, 1996)
Costing in Higher Education

Costing is one of the most useful policy-making and management accounting tools available to higher education senior managers. The application of costing methods to an institution of higher learning in Latin America—the University de Monterrey (UDEM) in Mexico is useful. This shows that potential economies are available if faculty productivity levels are increased. It is suggested that educational leaders must invest in technology that will facilitate the expansion and effective management of the system (Ahumada, 1992)

The Art of Costing and the Politics of Pricing

Costing and pricing are management accounting techniques for senior managers in educational institutions. In practice, only when the real costs have been established can the marketers decide what price to charge. Costing does not equal pricing, although price may well be legitimately set at, or even below cost providing the institution's pricing policy recognizes the possibility of loss-leaders and cross-subsidy. Successful institutions need a structure within which income-generating and entrepreneurial activities can fit. Overheads will be allocated in the following ways: (1) Incremental direct costing (Direct Cost plus a flat rate overhead) (2) Loaded Manpower rate, where a rate is applied based on direct payroll costs. (3) The Profit centre/cost centre approach, where all costs are charged to the lowest possible unit. (4) Activity based costing, whereby an overhead rate which is related to cost driver is added to direct costs (Palfreyman, 1998)

Cost allocation in University

Cost allocation is one of the management accounting technique used in higher education to allocate central costs. This is often made to academic departments on the basis of input factors such as the number of full-time equivalent students (FTEs), and part-time students being calculated at a fraction of FTE (Carr, 1997). Cost allocation in any organisation is made for a purpose. In university, this is done in a ‘fair’ distribution
of overheads to cost centres or to services so that the true cost of an activity can be ascertained.

Cost Apportionment

Cost apportionment is another management accounting technique to re-allocate the budgeted cost of each support centres where the academic cost centres use predetermined apportionment rates. The choice of a base for establishing an apportionment rate is arbitrary. The apportionment base should be selected by choosing a resource relationship between support and academic centre, which most closely reflects the linkage between the two. In other words the critical question is how does the activity level of an academic centre change the activity level of the support centres. For example, the number of enrolled students affecting the library usage. The term 'cost driver' can be used to describe this relationship. Identification and selection of the most appropriate 'cost driver' is crucial for accurate unit costing. Generally, absorption rates and unit costs are recalculated each financial year although some colleges have adopted the practice of establishing absorption rates which apply for a number of financial years subject only to an annual cost inflation adjustment cost (Carr, 1997).

Solutions for overhead allocation

Overhead allocation by overhead recovery is one of the management techniques for recovery overhead. In the past, university had recovered overhead charges by top-slicing the income of each resource centre. This overhead recovery provided the resource stream for the academic related sector of the University. However, the top-slicing procedure is not regarded as satisfactory. A new overhead allocation model is to charge overheads to academic resource centres. Each resource centre pays a price per student, a price per member of staff. This system has proven to be more acceptable to the academic sector than the previous top-slicing system (Scapens, Ormston and Arnold, 1994). On the other hand, it might be more appropriate to use a two-level approach for cost allocation in higher education. For institution management, it is better to focus primarily on central costs, and for an individual department, it will focus on its own costs. A responsible
departmental decision should take an institutional viewpoint, even though this may cause an adverse impact on the department itself (Howson and Mitchell, 1995).

After our previous discussion on the main features and effectiveness of the seven commonly used management accounting techniques and other important techniques, we have examined the experience of application of management accounting to educational institutions, including universities in the U.S.A. and U.K. We have concluded that management accounting model is useful for senior managers or principals in educational management. The model will provide appropriate financial data to enable them to manage their institutions more effectively. However, management accounting model has its limitations. The next section will discuss the inadequacy of the model.

The inadequacy of the management accounting model:

There are limitations to the management accounting model. Firstly, there are limitations of costing systems, for example, the problems relating to cost classification, overhead allocation and cost data collection. This restricts the effectiveness of management accounting (Cooper & Kaplan, 1988). Due to legal requirements for the rules and regulations applicable to financial accounting, management accounting has become subservient to financial accounting. The accounting systems are adjusted to suit the financial accounting requirement rather than for the use of management accounting (Johnson and Kaplan, 1989). There is relatively little attention that is given to external environment. Management accounting should provide other information rather than only costing information to arrive at a financial conclusion (Drury, 1992). Management accounting also fails to report on such issues as quality, reliability, lead times, flexibility and customer satisfaction, despite the fact that these non-financial measures are necessary to compete successfully in today's globalised competitive environment. (Drury, 1992). The rationale for management accounting is neo-classical economics, therefore it inherited the short-comings of neo-classical theory where newer economic theories attempt to explain some of the breaches of neo-classical theory by recognizing that
individual motivation will not aggregate to accord with organisational goals (Cooper, 1980).

Furthermore, there are other shortcomings of management accounting techniques. Budgetary Slack is one of the problems for the budgetary system. Budgetary slacks represent a degree of padding introduced into budgets so as to guard against possible failure to attain targets. Slacks exist within even the most efficient and well-run organisation. For discouragement of slacks, the budgetary system should emphasis that the budget should be attainable under normal working conditions; participation by individuals with detailed knowledge of the problems is likely to increase the realism of budgets (Arnold & Hope 1989).

Another problem is that budgeting and motivation are interrelated. Arnold and Hope (1989) claimed that all budgeting processes involve relationships between people. Thus budgeting entails behavioural change. Budgeting is a device for motivation, and better performance can be expected from employees if they have some say in the construction of the budget to be used to evaluate their performance.

There are problems in ascertaining the true cost of a course due to the different methods of allocation of costs and overheads. For total absorption costing approach, colleges use unit costs for computing output costs. The unit costing methodology requires the restatement of input costs as output costs. The total absorption costing systems utilize all or part of a three-stage approach covering cost allocation, cost apportionment and cost absorption. The approach allocates direct costs to academic and support cost centres and apportions the support centre costs to courses and academic cost centres. The absorption of academic cost centre aggregates direct and apportioned indirect cost to courses by using an absorption formula.

There are problems and limitations in the process of treatments of overheads for universities. There is problem for the bases of internal transfer prices for university departments providing services teaching, because the provision of budget is on timely
bases. Therefore university has to introduce changes in organisational structures and allocation models (Jones, S. 1994).

**A more coherent model could be more effective**

Management accounting was used in commerce and industry, but application of management accounting to education is still a new field. In United Kingdom, Local Management of Schools represents the introduction of management accounting to schools on strategic, tactical and operational levels (Murphy 1991). In Singapore, there is still a lack of a comprehensive systematic approach to management accounting system.

**The development of an more effective model which can be more effective in school resource management**

As mentioned earlier, in Singapore, cost information in schools is not properly collected. Even where it is collected, the information is incomplete, as it is not properly classified. At the end of the study, the findings may help the researcher to explore how far and to what extent a workable model of finance in Singapore education is used in Singapore schools. Through this literature review with particular reference to main features of the management accounting model and the experience of management accounting used in other countries, it is concluded that the model is useful to educational management. It is worthwhile to adopt the management accounting model. Bearing in mind its limitations, a more coherent model could be developed at the end of the study. This will be addressed in the next section.

**To set up costing system at site level for conformity and organisation structure requirement**

For individual institutions, the success factor is to implement an effective costing and pricing strategy. This requires the support and attention of top management to disseminate good practice through formal training. The documentation will be sent to all staff concerned. There is a need to formulate a consistent approach to the allocation of
staff time. The results of the costing strategy will decide the pricing process (CIMA, 2000). The view of the Chartered Institute of Management Accountants (2000) is that a clear definition of costing and pricing is important. An institution should develop a costing system.

**To set up a standard costing system which serves as a benchmark for budgeting, planning and evaluating performance.**

A standard costing system is a benchmark for efficiency. A standard cost is the level of cost which should be incurred for any given level of activity. Standard cost is an important means for budgeting and formula funding for schools (Levacic, 1997). It is suggested that a central body (e.g. Finance Division of the Ministry of Education) may implement the standard costing system. The standard cost of a school (or institute) of efficient size for its sector would be built up and determined. This system provides a challenging target which individuals are motivated to achieve. A prediction of future costs assists in setting budget and evaluating performance. Amongst other things, there must be a standard purchase data bank, which provides information on reliable suppliers to ensure efficient purchasing. It is common practice for most authorities to adopt bulk purchasing contracts for supplies and services.

**To provide suitable training for the principals and administrators**

The effectiveness of the model will depend on the size of the institution. Additionally, accounting knowledge of the administrator may affect the use of management accounting. Giaconino’s study (1978) showed that size (FTE enrolment) of institute significantly affected the controller’s use of management accounting techniques. The study also indicated that controllers with a Master’s degree showed significantly more involvement than controllers with Bachelor’s degrees in using the management accounting techniques. This showed that the Vice-Presidents for Business and Finance were using more management accounting techniques than the controllers. Therefore, the
training for administrators is important to the success of the management accounting model.

Training for administrator

The success of management accounting in schools depends on the training for the school administrators. Heads need to acquire new and different skills and knowledge to implement LFM. In order to do this job properly, they need some limited knowledge of accountancy and budgeting, additional negotiating skills, and information about the market in which they are placing contracts (Streatfield & Robert 1988). Senior managers or principals need training to acquire the following management skills: (1) Knowledge of the structure and operations of school finance (2) Understanding of financial terms and how the school’s finance operates in practice. (3) Skill in handling financial information, skill in drawing up a budget and establishing policies, knowledge of systems of information technology (Brunt 1989). Davis (1988) suggested a training course for staff to develop their financial management skill. The course included interpreting the cost structure of schools and expenditure printouts and financial interpretation skills, an appreciation of management information systems and the requirements of an effective financial information. The course also covered establishing a budgetary perspective. The purpose of the course is to develop a theoretical framework to consider budgets as a management process and not an administrative chore. A basic knowledge of accounting (such as purchasing supplies and reconciling the school accounts, budget management and bank account reconciliation) is one of the key qualities of an effective assistant principal (Linda 1997).

A budget handbook and a handbook on accounting techniques can serve as guidelines

The handbook would provide details of the budgeting process. This consists of the following steps: setting up guidelines; preparation of estimates; format of budgets; approval of budget; implementation and review (Murthy and Rao 1996).
**Setting up of Guidelines**

The most important aspect of the budgeting process is setting guidelines for the preparation of budgets. These guidelines may pertain to the objectives to be achieved during the year. Targets may be fixed in terms of new courses to be started, new programmes or departments to be created. Unfortunately, target setting is a difficult exercise for educational institutions. In the field of education, we cannot set targets just in terms of number of students or number of courses, we should consider also the quality of education. However, budgeting is not used as a potent tool for setting guidelines in academic performance. A budget director or controller is responsible for the overall budget preparation and coordination and assisted by the budgeting committee consisting of members of top management from each of the functional divisions.

**Preparation of estimates**

Estimates are made separately for receipts and expenditure. For receipts, schools can estimate fees from students, examinations, hostels, and rent on buildings. Compared to receipts, the preparation of estimates for expenditure is a lengthy process, since there can be numerous items of expenditure. The general procedure is that the departments are asked to submit proposals regarding their activities and the amount they propose to incur. An aggregate is arrived at for incorporation in the budget. The Financial Officer should scrutinize the estimates before submitting them to the Finance Committee.

**Budget Format**

The budget should be prepared in the approved format.

**Implementation and review**

Based on the budget proposals incorporated in the budget, departments are required to prepare a plan of action for achieving targets fixed in the budgets. There should be a system of reviewing the legitimacy of the actual expenditure (Murthy and Rao 1996, Arnold and Hope 1989)
To appoint bursars as the management accounting administrators and relieve principals

Levicic (1989) claimed that in Great Britain financial management is unlikely to be within the expertise of classroom teachers. The overall responsibility rested with the head and governing body. Thus training should be conducted for head teachers and support administrative staff. Harrold and Hough's (1988, p.14) viewed that 'the financial responsibility will be so time-consuming that it cannot be doubted that the appointment of a bursar with specialist accountancy qualifications and/or will be essential'. Emerson and Goddard (1993) believed that head teachers and their deputies, in particular, were concerned that the increased workload of local school management prevented them from concentrating on leading teaching and learning in schools. To relieve the principal from such a chore, if resources permitted, educational institutions should look outside education for managers with financial and business backgrounds to take responsibility for resources and the large numbers of support staff in schools (Bush, Coleman and Glover 1993). Generally, the study supported the need for appointing a professional bursar to relieve the principals from their financial responsibility.

To set up a computerized database to facilitate financial analysis

Lucas (1976) and Coleman & Anderson (2000, p.200) have defined information as "some tangible or intangible entity that reduces uncertainty about a state or event". The relationship between decision-making and the availability of information is a crucial one (Davis and Olsen (1985). Coleman & Anderson (2000, p.200) suggested that it is "data that has been processed into the form that is meaningful to the recipient, and has real perceived value in current or prospective decisions".

In school, timely and actionable information should be accurate, specific, available and flexible. It can provide school business managers with the tools they need to meet the rising demand for school improvement. (Speakman et al, 1997). Riashi-Belkaoui explained (1992, p66): "the interaction of the management accounting system with all other systems within the organisation, and especially the integration of these systems, are essential for an efficient functioning of the organisation. A management
accounting system may be defined as the set of human and capital resources within an organisation that is responsible for the production and dissemination of information deemed relevant for internal decision”. To implement a new information system may require the manager to re-think the basis on which information is configured and used, to re-tool the models and technologies for gathering, analyzing, and managing such information, and to re-evaluate school-specific information and its uses in planning and decision-making. Hence, good managerial information is based on the use of modern accounting and reporting tools.

The availability of information has been transformed by new technologies, appropriately designed information and communication technologies. The term ‘information system’ is often used to mean a computer network; it includes other networks and channels of communication such as meetings, memoranda, telephone calls and conversations in various contexts. (Baines, 2000). In short, an efficient management accounting system should make use of the computer network and channels of communication of new technologies for the production and dissemination of information deemed relevant for internal decision.

Effective Information Acquired from Online Accounting System

Bob (1996) reported that the Board of Education established a wide area computing network to bring all of the school sites online within the accounting system. It acquired a software module, which provided the capability for remote site entry of purchase of goods and services, thus allowing the principal to gain instant status reports.

In Singapore, the researcher suggests that the Ministry of Education should set up an online financial system with a data bank for management accounting information to provide timely, relevant information for school administrators involved with decision-making.

To introduce an overall performance indicator (balanced scorecard system) to facilitate overall performance comparison among schools
The common management accounting techniques mentioned above are generally indicators to measure effectiveness and efficiency. There are limitations of costing systems in providing non-accounting information like quality, innovation, student satisfactory and technology. They do not provide an overall performance measurement to facilitate overall performance comparison among schools. Management accounting techniques like balanced scorecard can be designed as one of the mechanisms for assessment of non-quantified elements. The researcher suggests that a new indicator like balanced scorecard can be designed for non-financial elements and used for measuring school overall performance.

Kaplan and Norton introduced the balanced scorecard in 1993. They suggested that the model cover the four critical issues to measure the overall performance of a business unit:

1. Having a customer perspective: Measurement focused on external data such as quality, responsiveness and costs. These are to satisfy customer requirements.
2. Process capability: Building capability internally is essential to become competitive.
3. Focus on innovation: Competitiveness is based on fulfilling customer requirements through creativity and innovation.
4. The financial perspective focusing on the shareholder: Shareholders are another set of customers and value added to shareholders has to be continuously monitored and measured (Kaplan and Norton 1993).

Schools may adopt this model to measure the overall performance of schools in respect of the following four perspectives: (1) Student’s perspective (2) Process capability (3) Innovation and (4) Financial perspective. This may help school senior managers or principals to assess the schools performance and facilitates a more equitable approach in comparisons with other schools.

Conclusion
The literature review shows that management accounting assists school management in educational management, coordination and strategic planning. It provides feedback to educational organisations and assists in resource management. The most common management techniques used are: (a) accounting information (b) budgetary system (c) Variance analysis and standard costing (d) decentralisation, profit/cost centres (e) Unit cost and unit income (f) ratio analysis (g) other management accounting techniques. According to the literature, these techniques are useful to senior managers and principals in educational management. The research shows that most of the literature is from the United Kingdom and the United States. There is very little literature on the application of management accounting in Singapore institutions.

The management accounting techniques have been widely used in schools, institutions and universities. Geographically, it has also been used in many countries, such as United Kingdom, United States, India and African nations. More universities are using activity-based costing. The extent of application of management accounting may be affected by the accounting knowledge proficiency of the principal/administrator and the size and structure of the institution/school. Similar to industry and commerce, management accounting has its limitations in application to educational institutions.

In spite of its limitations, the literature review shows that management accounting is an important management tool for an educational institution's administrators. Management accounting system is still not applied in full in other countries like USA and United Kingdom. The extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is important as there is very little literature on the application of management accounting in Singapore institutions. Therefore, the research problem addressed by this thesis is focused on:

**Management accounting in education: stakeholder perceptions in Singapore**

The research is focused on the extent of the application of management accounting in the educational institutions of Singapore and the attitude of the senior
management of these institutions towards the effectiveness of management accounting as a management tool. This is addressed by the following research questions:

(1) The extent of the application of management accounting techniques in Singapore educational institutions:
   (a) What is the extent of using accounting information?
   (b) What is the extent of using a budgetary system?
   (c) What is the extent of using variance analysis and standard costing?
   (d) What is the extent of using decentralisation and profit/cost centres?
   (e) What is the extent of using unit cost and unit income?
   (f) What is the extent of using ratio analysis?
   (g) What is the extent of using other management accounting techniques?

(2) What is the attitude of the senior managers or principals towards the usefulness of the various aspects of the following management accounting techniques?
   (a) Using accounting information,
   (b) Using a budgetary system,
   (c) Using variance analysis and standard costing.
   (d) Using decentralisation and profit/cost centres,
   (e) Using unit cost and unit income,
   (f) Using ratio analysis,
   (g) Using other management accounting techniques.

(3) Would senior managers or principals find management accounting useful for their work?

(4) Are senior managers or principals willing to have training on management accounting techniques?

The research findings may help to explore how far and to what extent a workable model of finance in Singapore education is used in Singapore schools. This workable model would overcome the shortcomings of the current situation. This will ascertain the situation in Singapore as compared with the assertions described in the literature. Through this research, the researcher can ascertain how management techniques can help educational administrators to improve the quality of the institutions and to use limited
resources effectively. At the end of the study, these findings may support the researcher to develop a workable Model of Finance in Singapore Education, which would overcome the shortcomings of the current situation.
Chapter 3

Methodology
Chapter 3

Methodology

Introduction

As mentioned in Chapter 1, the benefit of adopting the full management accounting model is to assist the senior managers or principals with current budgeting and future planning in resource management and management decision making. From the researcher's observations management accounting does not manifest itself in educational institutions in Singapore. There is a question of effectiveness and adequacy of the present system and there is also a poor understanding of management accounting by many school principals and institutional administrators. Thus, it needs to be empirically verified by this research, the extent to which management accounting is used in Singapore educational institutions. The attitudes of the senior managers or principals towards this model, and the degree to which it informs the management of the current budget and future planning also needs to be explored. This is the research problem addressed by this thesis.

The research focus is on:

Management accounting in education: stakeholder perceptions in Singapore

This research assumes that in spite of the Singapore Government accounting service's emphasis on the management accounting system, management accounting does not manifest itself in educational institutions in Singapore. As a result, school principals and managers do not have appropriate financial data to enable them either to manage their current budgets effectively or to plan for the future.

If a rigorous process of management accounting system was adopted in Singapore schools, then the benefits of adopting full management accounting are likely to accrue. Thus, the research will be focused on the extent to which management accounting techniques are used in Singapore institutions, and the attitude towards the effectiveness of this model needs to be verified. This can be addressed through the following research questions: -
The extent of application of management accounting techniques in Singapore educational institutions.

(a) What is the extent of using accounting information to make decisions in respect of:
   Control expenditure?
   Cash flow planning?
   Evaluation of performance and profitability?
   Determination of whether to start a new class or a new programme?

(b) What is the extent of using budgetary systems in respect of:
   Planning and control?
   Co-ordination of all departments?
   Linking organisational objectives?
   Human side of budgetary system?
   A means of asking for additional funding?

(c) What is the extent of using variance analysis and standard costing to:
   Explain the difference between the actual and the budgeted?
   Control expenditure and highlight problems?
   Monitor performance by standard costing?

(d) What is the extent of using decentralisation and setting up profit/cost centres for:
   Resource allocation?
   Expenditure control?
   Responsibility identification and innovation?
   Revenue accountability?

(e) What is the extent of using unit cost and unit income for
   Pricing and costing?
   Costing control and decision making?
   Evaluating performance and efficiency?

(f) What is the extent of using ratio analysis for data analysis?

(g) What is the extent of using other management accounting techniques in respect of:
Marginal costing?
Breakeven analysis?
Returns to capital?
Cost apportionment?
Discounted cash flow?
Activity based costing?
Direct cost, variable cost, fixed cost and overheads?
Performance indicators?

The success of application of these techniques is dependent on the attitudes of school administrators towards the techniques. The study also considers the attitudes of the senior management of these institutions towards the use of these techniques as a management tool. This is addressed by the following questions:

(2) What is the attitude of the senior managers or principals towards the usefulness of the management accounting techniques in the following aspects:

(a) Using accounting information to make decisions?
(b) Using a budgetary system?
(c) Using variance analysis?
(d) Using decentralisation and setting up profit /cost centres?
(e) Using unit cost and unit income?
(f) Using ratio analysis?
(g) Using other management accounting techniques?

(3) Would senior managers or principals find management accounting useful for their work?

(4) Are senior managers or principals willing to have training on management accounting?
The population for the study

As explained above, the population comprises all educational institutions in Singapore. This is listed in the Directory of Schools and Educational Institutions published by the Ministry of Education, Singapore (Ministry of Education, 1998). This covers all registered Educational Institutions in Singapore.

Table 3.1 gives the detailed classification:

<table>
<thead>
<tr>
<th>Type</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tertiary</strong></td>
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<tr>
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<td><strong>Technical</strong></td>
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<tr>
<td>Institute of Technical Education (ITE) Centre</td>
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<tr>
<td>Junior College-Govt.-Aided</td>
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<td>16</td>
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<tr>
<td>Centralised Institutes</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Secondary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School-Govt.</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>Secondary School-Govt.-Aided</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Secondary School-Independent</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Private Regular School</td>
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<td>Foreign System School</td>
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<td>Commercial School</td>
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<td>Correspondence School</td>
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<td>Tutorial School</td>
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<td><strong>Others</strong></td>
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<td>Week end Centre</td>
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<td></td>
</tr>
<tr>
<td>Special Schools/Centre</td>
<td>19</td>
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<tr>
<td>Islamic Religious School</td>
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<td></td>
</tr>
<tr>
<td>Language Schools</td>
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<td>Others</td>
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<td>110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>961</td>
</tr>
</tbody>
</table>
In this case, the population is readily identifiable. However, there are insufficient resources to contact all key management personnel, administrators and accounting staff of all the institutions in Singapore. Furthermore, the population vary considerably in their accessibility; administrators in the public institutions are relatively easy to survey, but management personnel from private small size schools and institutions are more elusive. Therefore, the need for sampling does arise. In this large-scale survey, the research will be based on a sample drawn from the population to be studied (Moser and Kalton 1972).

**Choice of research methods**

A survey is “an activity to elicit equivalent information from an identified population.” ‘Eliciting’ here implies something more proactive than collecting information (Johnson, 1994). Johnson (1994, p.13) claimed that a survey is the most commonly used descriptive method in educational research. This research involves a large population. Surveys are suitable for researching a large population. Therefore this research will use the survey method for gathering information. Survey method has the following advantages:

(1) **Breadth of coverage**

The research tool for survey is standardised, once the questionnaire or interview schedule has been designed.

(2) **Generalizability/comparability**

Survey findings can be generalised to a wider population. If comparable definitions of basic variables have been used, it is also possible to compare results with those of other surveys.

(3) **Descriptive Power**

Surveys typically produce a large amount of factual information, which can be cross tabulated in many ways to provide a wealth of description. This can provide a basis for further research with a more explanatory aim.

(4) **Multiple-Purpose**
A given survey may serve several purposes. Survey data may be collected for a particular purpose, but the same data may be subjected to secondary analysis for different purposes by other researchers.

(5) Permanence of survey data

At one point in time, a set of survey data may be analysed and found to support a general theoretical perspective. If the theory is subsequently displaced by another, the original survey data may be reanalysed to determine whether they support the new theory.


The survey method is used because the population is large and only equivalent information is needed. In addition, the survey questions are standardised and convenient to use. They can be in the form of an interview or a self-completion questionnaire.

Types of survey

The kind of information obtained from a survey may be "facts", attitude or opinions. Surveys may vary in their level of complexity from those that provide simple frequency counts to those which present relational analysis. The complexity and scope of a survey is very much determined by the objectives of the research. The purpose of a survey is to give a research basis for collated description or comparison. Whether the survey is large-scale and undertaken by some governmental bureau or small-scale and carried out by the lone researcher, the collection of information involves one or more of the following data-gathering techniques:

(1) A self-completion or postal questionnaire
(2) Structured or semi-structured interviews
(3) Attitude scales
(Cohen & Manion 1994, p.83)

Postal Questionnaires

The questionnaire is an instrument comprising a series of questions that are filled in by the respondents themselves (self-completion questionnaire). It may be handed or
mailed to them. A mailed questionnaire is a useful technique if respondents are spread out over a fairly large geographical area and the researcher has limited resources. Having the respondents complete the questionnaire themselves usually saves time and money. On the contrary, an interview survey based upon some sampling of the population of educational institutions would be both expensive and time consuming. Postal questionnaires are more appropriate for their breadth of coverage and generalisability. They are the best forms of survey in educational management inquiries. Therefore, in this study the researcher would use the postal questionnaire techniques for data collection. This is suitable for the current study of a large population of Singapore educational institutions. As senior managers or principals are busy people, a questionnaire is also convenient to them, it allows the respondent to read all the questions before completing any, and they may complete and return the questionnaire at a time convenient to themselves. (Sanford and Robert 1971, Cohen & Manion, 1994 and Johnson, 1994).

A postal questionnaire has the following advantages:

(1) The number of respondents who can be reached through questionnaire is extensive, whilst the number of interview participants would be limited.

(2) The major expenses for questionnaires are postage and printing, which are less than the cost and time for interviewers.

(3) Questionnaires do not require a group of interviewers. Even though the total population of Singapore educational institutions is about one thousand, by means of sampling, it is still manageable for a single researcher.

(4) The sources of error for questionnaire are limited to instrument and sample, while interview is subject to the bias of interviewer, coding, instrument and sample.

(5) The overall reliability is higher for questionnaire than interview; the degree of reliability can be objectively determined by means of statistical measurement. (Johnson 1994, Moser and Kalton 1972, Stanford & Robert 1971)

This method is more suitable for this research because the main survey data collection is done by questionnaires for its breadth of coverage. This research will use postal questionnaires supplemented by semi-structured interviews to collect data on more
in-depth questions. This will form as a triangulation of combination of different survey methods. Semi-structured interviews with principals will enable a more in-depth assessment of the ways in which financial management techniques are used in schools.

An interview is a social encounter between two people with a particular focus and purpose. Interviews can be conducted in structured interviews or semi-structured interviews.

**Structured or semi-structured interviews**

The structured interview is one in which the content and procedures are organised in advance. This means that the sequence and wording of the questions are determined by means of a schedule and the interviewer is left with little freedom to make modifications. This is a closed situation. The interview schedule is carefully worded and frequently requires short answers or the ticking of a category by the researcher. They are often like a written questionnaire in form. The structured interview is useful when a lot of questions are to be asked which are not contentious and deeply thought provoking. (Johnson 1994, Cohen & Manion 1994)

In the semi-structured interview, a carefully worded interview schedule is assembled, but in this case, more flexibility is allowed. Generally, there is an initial question followed by probes. The interview schedule provides spaces for the interviewer to record notes. A semi-structured interview is most favoured by educational researchers as it allows interviewees to express themselves at some length, but prevents them from aimless rambling. (Johnson 1994, Cohen & Manion, 1994).

The combination of the postal questionnaires and semi-structured interviews will form as a triangulation of combination of different survey methods. As Hammersley and Atkins (1989, p.199) pointed out, "what is involved in triangulation is not the combination of different kinds of data per se, but rather an attempt to relate different sorts of data in such a way as to counteract various possible threats to the validity of our analysis". It is recognized that social research can never be entirely objective, since no researcher is value free (Johnson, 1987). In practice, there is a move amongst
management researchers to develop methods and approaches that provide a middle
ground, and some bridging between the two extreme viewpoints. (Smith, Thorpe &
Lowe, 1994). Therefore, for the above reasons and for triangulation, the researcher will
use postal questionnaires supplemented by interview for this study.

An attitude scale

An attitude scale consists of a number of attitude statements, with which the respondent
is asked to agree or disagree. Since so much depends on the way the issue is put into
words, a single item or a single question is often unreliable and, because it is usually
approached from one particular direction only, may give rather one-sided results
(Oppenheim, 1973). Attitude scales usually form part of a questionnaire or structured
interview.

Since this research is focused on the attitude of the senior management of the
institutions, the researcher will include attitude scale statements in the postal
questionnaire.

Design of the research techniques

The research will be focused on the extent of the application of management
accounting to the educational institutions in Singapore and the attitudes of the senior
management of these institutions towards the effectiveness of management accounting as
a management tool. The stakeholders here refer to the senior management, such as
principal, managing director, director, owner, partner, supervisor, finance manager,
accountant, administrator, clerical officer and accounts officer.

Design of Questionnaires

A questionnaire is relevant if no unnecessary information is collected and if
information that is needed to solve the problem is obtained. Asking an irrelevant question
is a pitfall to be avoided. To ensure information relevancy, the researcher must be
specific about data needs, and there should be a rationale for each item of information. In
addition, the researcher should ensure the information is reliable and valid. (William, 1988).

Therefore, the questionnaire (Appendix 3.1) for this research is designed in relation to the research questions mentioned in Chapter 1

(1) What is the extent of using accounting information to make decisions in respect of:

- Control of expenditure? (Questions 1.5, 1.6)
- Cash flow planning? (Question 1.7)
- Evaluation of performance and profitability? (Questions 1.1, 1.2, 1.3)
- Determination of whether to start a new class or a new programme? (Question 1.4)

(2) What is the extent of using a budgetary system in respect of:

- Planning and control? (Questions 2.1, 2.2, 2.4)
- Co-ordination of all departments? (Questions 2.5)
- Linking organisational objectives? (Question 2.8)
- Human side of budgeting? (Questions 2.6, 2.7)
- A means of asking for more funds? (Question 2.3)

(3) What is the extent of using variance analysis to:

- Explain the difference between the actual and the budgeted? (Question 3)
- Control expenditure and highlight problems? (Questions 3.1, 3.2, 3.3)
- Monitor performance by standard costing? (Question 3.4)

(4) What is the extent of using decentralisation and setting up profit /cost centres for:

- Resource allocation? (Question 4.4)
- Expenditure control? (Questions 4, 4.3)
- Responsibility identification and innovation? (Question 4.2)
- Revenue accountability? (Question 4.1)

(5) What is the extent of using unit cost and unit income for:
Pricing and costing? (Questions 5.1, 5.5)
Costing control and decision-making? (Questions 5.2, 5.3, 5.4)
Evaluating performance and efficiency? (Questions 5, 5.5, 5.6)

(6) What is the extent of using ratio analysis for data analysis?
(Questions 6.1, 6.2, 6.3)

(7) What is the extent of using other management accounting techniques in respect of:
   (Question 7)
   Marginal costing? (Question 7.1)
   Breakeven analysis? (Question 7.2)
   Returns to capital? (Question 7.3)
   Cost apportionment? (Question 7.4)
   Discounted cash flow? (Question 7.5)
   Activity based costing? (Question 7.6)
   Direct cost, variable cost, fixed cost and overheads? (Question 7.7)
   Performance indicators? (Question 7.8)

(8) Would senior managers or principals find management accounting useful for their work? (Question 8.1)

(9) Are senior managers or principals willing to have training on management accounting? (Question 8.2)

As mentioned in the section for the pilot study below, item (8) & item (9) are new questions added to the questionnaire after the pilot study. (See Appendix 3.2)

The survey of the extent of usage will be in form of a three point scale of “Usually”, “Sometimes” and “Rarely” to represent the frequency and extent of usage. As for the attitude of the administrators, the attitude statements are incorporated in the questions of the questionnaire.

Research strategy

As the scope of management accounting is very wide, the study will be on techniques like budgeting, costing, variance and ratio analysis which are commonly used
in other countries. This does not involve studying the application of each technique in fine detail. Since accounting information and statistics are normally considered confidential, it is anticipated that the response rate will be low. As the research population is large, a postal questionnaire is used first to gather the primary information. This will be followed by interviews to obtain more in-depth information to assess the ways in which financial management techniques are used in schools. It also strengthened the study by triangulation that attempts to relate different sorts of data in such a way as to counteract various possible threats to the validity of the analysis (Hammersley and Atkinson, 1989).

The researcher is committed to providing a faithful description of other’s understandings and perceptions, then ideas such as validity and reliability can provide a very useful discipline.

Validity

The purpose of measurement is to measure what we intend to measure. Validity concerns whether an instrument measures what is supposed to measure. Researchers want to know if their measure is valid, and the question of validity expresses their concern with accurate measurement. Validity addresses the problem of whether a measure (for example, an attitude measure) measures what it is supposed to measure. If it does not measure what we designate it to measure, there will be problems. There are three basic approaches to dealing with issue of validity.

Content validity refer to the subjective agreement among professionals that a scale logically appears to accurately reflect what it purports to measure. Criterion validity is an attempt by researchers to answer the question “Does my measure correlate with other measures of the ‘same’ construct?” Construct validity is established by the degree to which the measure confirms a network of related hypotheses generated from a theory based on the concepts. In construct validity the empirical evidence is consistent with the theoretical logic about the concepts. In its simplest form, if the measure behaves the way it is supposed to, in a pattern of intercorrelation with a validity of other variables, there is evidence for construct validity (William, G.Z., 1986).
Reliability

Reliability concerns whether the measure yields the same results on different occasions (Mark, E., Richard, T. and Andy, L., 1994). Reliability applies to a measure where similar results are obtained over time and across situations. Broadly defined, reliability is the degree to which measures are free from error and therefore yield consistent results. Imperfections in the measuring process, such as a respondent who misunderstands a question, are the cause of low reliability. Two dimensions underlie the concept of reliability: repeatability and internal consistency. The high stability correlation or consistency between the two measures at Time 1 and Time 2 indicates a high degree of reliability.

Where reliability is a problem, there is advantage in using more than one kind or source of data in relation to a particular criterion: 'triangulation' (Kath, A., Tim, S., John, F. W., and M. John, M., 1994). The goal of reliability is to minimise the errors and biases in a study. This is to ensure that the data collected by postal questionnaires is reliable. This study will use SPSS (Statistical Package for Social Science) computer software to perform the reliability analysis.

Sample size

The educational institutions include all schools, junior colleges, centralised institutes, technical education centres, special schools, foreign system schools, commercial schools, tutorial schools, polytechnics and universities. The total number of institutions is 961. In the above case, the population is readily identifiable. There are not sufficient resources to contact all key management personnel, administrators and accounting staff of all the institutions in Singapore; the need for sampling does arise (Moser and Kalton, 1972).

There is no clear-cut answer to the correct size of sample. It depends upon the purpose of the study, the nature of the population and the amount of imprecision which the researcher decides to tolerate. If researchers plan to use some form of statistical
analysis on their data, the minimum number of sample size is thirty, though technique like students-t distribution is available for analysis of samples below thirty. For a large sample, 30 is the minimum sample size, therefore, thirty was chosen as the sample size for the pilot study (Perles & Sullivan, 1969 and William, 1988). In order to facilitate a thorough examination of relationships that might be explored within subgroups of the eventual sample and help to establish the number of variables and the types of statistical test used prior to the actual data collection, the sample size needs to reflect the population value of a particular variable both upon the size of the population and the amount of heterogeneity of the variable in the population (William 1988). Therefore the pilot sample should reflect the amount of heterogeneity of the variable of the population.

Sample size can be found from published statistical tables (Nan Lin, 1976). In the table for parameter in population assumed to be over 85% or under 15% and for 95 % confidential level (i.e. with over 85% proportion of success in estimation or under 15% proportion of failure in estimation and with a ± 5% or -5% of sample error. Sampling error arises because a sample can not give complete information on a population):

A sample size for a population of 1000 at + or -5 % reliability is 235
A sample size for population of 2000 at + or -5 % reliability is 266.
As the population of Singapore Educational Institutions is about 1,000,
for the above sampling error, the researcher chose a sample size of 235 for this research.

The sample size at this confidence level is acceptable for the survey. Furthermore, the results of the survey will be verified by the Reliability Analysis-Scale (Alpha) test stated below.

**Sampling design**

The purpose of sample survey design is to maximise amounts of information for a given cost. As the research population consists of schools of different types, each with similar characteristics, the researcher has adopted a stratified sampling method in selecting the sample. A stratified random sample is obtained by separating the population
elements into non-overlapping groups, called strata, and then selecting a random sample from each stratum (Scheaffer, 1990). Perles and Sullivan (1969, p.169) defined “a sample is random as if every item in the population has an equal chance of being included in the sample”. Stratified sampling has been designed to ensure that all-important views are represented in proportion to the size of that group in the population as a whole (Perles and Sullivan, 1969). For simplicity and cost saving, the stratified sample may be subjective, based on the convenience and judgement of the researcher. For example, most of the tertiary institutions have better accounting and administrative systems than the commercial schools; therefore more weighting is assigned to them. Table 3.2 shows the composition of the sample. The institutions/schools selected within a group was by random sampling.

This sample selected schools randomly from each type of school from the 1998 schools directory. Every school in the 1998 Schools Directory had an equal chance of being included in the sample in respect of each type of institution, so that they are proportionally represented in the sample. Therefore the identified group will be a stratified sample with a variable version of purposive sampling. For example, for primary schools in Table 3.2, 30 primary schools were picked randomly from the primary schools listed in the 1998 Schools Directory. Similarly, 21 secondary schools were picked randomly from the secondary schools listed in the Directory. In purposive sampling, the researcher includes an item in the sample on the basis of their judgement of their typicality. In this way, they build up a sample that is satisfactory to their specific needs (Cohen and Manion, 1994).
Table 3.2 Computation of Sample sizes

<table>
<thead>
<tr>
<th>Type</th>
<th>No</th>
<th>Weighting</th>
<th>Sample Size</th>
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<td>Technical</td>
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<tr>
<td>Institute of Technical Education (ITE)Centre</td>
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<tr>
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<td>4</td>
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<td>Islamic Religious School</td>
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<td>0.2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Total</td>
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<td>235</td>
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Pilot Survey

It is difficult to plan a survey without a good knowledge of the subject matter, the population it covers, and the way people react to the questionnaire. Therefore, it is
advisable to conduct a pilot survey before the main survey, to try systematically all the
various features of the main inquiry. For pilot study, thirty was chosen as the sample size.
This facilitated a thorough examination of relationships that might be explored within
subgroups of the eventual sample and helped to establish the number of variables and the
types of statistical test used prior to the actual data collection. A pilot survey provides
guidance on the planning of the main survey in:

(a) The adequacy of the sampling frame from which it is proposed
to select the sample.
(b) The variability within the population to be surveyed. This is important
in determining an efficient sample design.
(c) The non-response rate to be expected. The probable numbers of
refusals and non-contacts can be roughly estimated from the pilot
survey and the effectiveness of various ways of reducing non-response
can be compared.
(d) The suitability of the method of collecting the data.
(e) The adequacy of the questionnaire. The pilot survey offers a way
of trying it with the same kind of respondent (Moser & Kalton, 1972).

Sample of Pilot Study

A stratified sample of thirty educational institutions was drawn randomly and
proportionally from each type of institution in the population. Every school in the 1998
schools directory had an equal chance of being included in the sample in respect of each
type of institute, so that they were proportionally represented in the sample. The number
of schools selected can be determined by some subjective weighting as discussed earlier.
For example, for primary schools in Table 3.3, 5 primary schools were picked randomly
from the primary schools listed in the 1998 Schools Directory; similarly, 7 secondary
schools were picked randomly from the secondary schools listed in the Directory. The
composition of the pilot samples is shown in Table 3.3.
Table 3.3 Composition of the pilot sample

<table>
<thead>
<tr>
<th>Type</th>
<th>No</th>
<th>%</th>
<th>Pilot Sample</th>
<th>%</th>
<th>Return</th>
<th>% of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td>7</td>
<td>0.7%</td>
<td>1</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>30</td>
<td>3.1%</td>
<td>1</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior College</td>
<td>16</td>
<td>1.6%</td>
<td>1</td>
<td>3%</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary School</td>
<td>180</td>
<td>18.7%</td>
<td>7</td>
<td>23%</td>
<td>3</td>
<td>42%</td>
</tr>
<tr>
<td>Primary School</td>
<td>193</td>
<td>20.1%</td>
<td>5</td>
<td>17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>95</td>
<td>9.8%</td>
<td>3</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>330</td>
<td>34.3%</td>
<td>8</td>
<td>27%</td>
<td>1</td>
<td>13%</td>
</tr>
<tr>
<td>Others</td>
<td>110</td>
<td>11.4%</td>
<td>4</td>
<td>13%</td>
<td>1</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>961</td>
<td>30</td>
<td>6</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Questionnaire for pilot sample

The questionnaire for pilot sample is in Appendix 3.2. There are seven groups of questions to evaluate the extent of usage and the attitude of the respondents towards the various aspects of management accounting. Respondents are asked to indicate their opinion by ticking one of the three opinions: “Usually”, “Sometimes” and “Rarely”. The details of these questions are listed below under the analysis of pilot test questionnaires.

The purpose of group 1 questions is to find out the extent to which the respondents use accounting information to make decisions. Group 2 questions are intended to establish the extent to which budgeting is used as a management tool. Questions in groups 3, 4, 5 and 6 are intended to find out the extent of use of variance analysis, profit/cost centre, unit costs, and ratio analysis. Group 7 questions are used to establish the extent to which more advanced techniques used in other countries may be applicable to Singapore.

Response of Pilot Sample

30 questionnaires were distributed by post to the institutes/schools randomly by picking schools from the 1998 school directory in respect of each type of institute, so that they are proportionally represented in the subjective weighting. The response rate of 20% (see Table 3.3) is fairly low. Therefore, when the actual questionnaires were dispatched, the author increased the sample size beyond the designated size of 235 to 335 to attract
more returns, as the response was not favourable. (See Chapter 4 table 4.1 which shows that the sample sizes for Junior Colleges, Secondary and primary schools have been increased).

**Analysis of the Pilot Survey**

The next seven tables present the findings of the pilot survey and express the responses in each of the three categories (usually, sometimes, and rarely) in percentages. There is also an additional “N.A” category which gives the percentage of respondents who either give the answer as “N.A” or leave it blank without indicating their opinion.

The summary of the analysis is:

**Table 3.4 Group 1 Questions: Accounting Information**

<table>
<thead>
<tr>
<th>1.</th>
<th>Have you ever made use of accounting information to make decisions on how to:</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Evaluate the performance of your institute/school</td>
<td>17%</td>
<td>17%</td>
<td>50%</td>
<td>16%</td>
</tr>
<tr>
<td>1.2</td>
<td>Evaluate the profitability of your institute/school</td>
<td>17%</td>
<td>34%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Evaluate the performance of one division by comparing it with another division in your institute/school</td>
<td>67%</td>
<td>33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Determine whether to start a new class or a new programme</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Control the expenditure of your institute/schools</td>
<td>33%</td>
<td>33%</td>
<td>17%</td>
<td>34%</td>
</tr>
<tr>
<td>1.6</td>
<td>Spend on capital expenditure</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>Plan cash flow requirements</td>
<td>33%</td>
<td>17%</td>
<td>17%</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td>19%</td>
<td>22%</td>
<td>26%</td>
<td>33%</td>
</tr>
</tbody>
</table>

This shows that 41% of respondents usually or sometimes make use of accounting information for decision making.

**Table 3.5 Group 2 Questions: Budgeting**

<table>
<thead>
<tr>
<th>2.</th>
<th>Does your institute/school prepare a budget annually? Or periodically?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Are you involved in the preparation of the budget?</td>
<td>83%</td>
<td>17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Is budgeting useful for planning your operations/programme?</td>
<td>66%</td>
<td>17%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Is budgeting a useful means of asking for additional funding?</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Is budgeting useful for controlling</td>
<td>33%</td>
<td>33%</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>
This showed that 63% of respondents usually or sometimes make use of budgeting.

Table 3.6 Group 3 Questions: Variance Analysis

<table>
<thead>
<tr>
<th>3</th>
<th>When the actual income or expenditure is higher or lower than the budgeted income/expenditure, do you have to give reasons to explain the difference or variance?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Variance analysis is useful to control overspending.</td>
<td>17%</td>
<td>17%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>3.2</td>
<td>Variance analysis is helpful to monitor sales promotion effort.</td>
<td>34%</td>
<td>33%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Variance analysis is useful to highlight problems.</td>
<td>17%</td>
<td>17%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>3.4</td>
<td>Standard costing is useful to monitor Performance.</td>
<td>17%</td>
<td>17%</td>
<td>17%</td>
<td>66%</td>
</tr>
<tr>
<td>3.5</td>
<td>Variance analysis is useful for my daily operations.</td>
<td>17%</td>
<td>33%</td>
<td>33%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>17%</td>
<td>14%</td>
<td>31%</td>
<td>38%</td>
</tr>
</tbody>
</table>

This shows that 31% of respondents usually or sometimes make use of variance analysis.

Table 3.7 Group 4 Questions: Profit centre/Cost centre

<table>
<thead>
<tr>
<th>4.</th>
<th>Is decentralisation and setting up of cost centres useful to control cost?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Profit centre is useful for accounting for revenue.</td>
<td>33%</td>
<td>17%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Profit centre gives the manager more responsibility and innovation.</td>
<td>17%</td>
<td>17%</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td>Cost centre makes managers careful in their expenditure.</td>
<td>17%</td>
<td>17%</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>4.4</td>
<td>Cost centre assists in allocating resources.</td>
<td>33%</td>
<td>17%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>3%</td>
<td>20%</td>
<td>17%</td>
<td>60%</td>
</tr>
</tbody>
</table>
This shows that 23% of respondents usually or sometimes make use of profit/cost centres.

**Table 3.8 Group 5 Questions: Unit Costs**

<table>
<thead>
<tr>
<th>5.</th>
<th>Have you ever made use of unit cost (e.g. cost per student, fee per student etc) to give you a quick evaluation of the financial performance of your course?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Unit cost is useful for pricing a course.</td>
<td>34%</td>
<td>33%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Unit cost assists in deciding on when to run, expand or drop courses.</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>5.3</td>
<td>Unit cost assist in evaluating alternative delivery methods.</td>
<td>17%</td>
<td>33%</td>
<td>17%</td>
<td>33%</td>
</tr>
<tr>
<td>5.4</td>
<td>Unit cost is helpful in controlling overspending.</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>5.5</td>
<td>Unit cost measures the relative profitability and efficiency of a course.</td>
<td>34%</td>
<td>66%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.6</td>
<td>Unit cost is useful in setting targets and monitoring performance.</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>4%</td>
<td>35%</td>
<td>25%</td>
<td>36%</td>
</tr>
</tbody>
</table>

This shows that 39% of respondents usually or sometimes make use of unit costs for decision-making.

**Table 3.9 Group 6 Questions: Ratio Analysis**

<table>
<thead>
<tr>
<th>6.</th>
<th>Have you ever made use of ratio analysis?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>To compare one item of expenditure with another item of expenditure.</td>
<td>50%</td>
<td>17%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>To compare one item of income with another item of income.</td>
<td>50%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>To compare accounting statistics of one unit with those of another unit.</td>
<td>17%</td>
<td>33%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>6.4</td>
<td>Ratio analysis is useful for my daily operation.</td>
<td>50%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>17%</td>
<td>38%</td>
<td>45%</td>
<td></td>
</tr>
</tbody>
</table>

This shows that 17% of respondents sometimes make use of ratio analysis.

**Table 3.10 Group 7 Questions: Other management accounting techniques**

<table>
<thead>
<tr>
<th>7.</th>
<th>Have you ever made use of the following management accounting techniques?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Using marginal costing to decide whether to start a class or a programme.</td>
<td>50%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td>Using break-even analysis to decide whether to start a class or a programme.</td>
<td>17%</td>
<td>33%</td>
<td>50%</td>
<td></td>
</tr>
</tbody>
</table>
### Additional questions for Questionnaire

From the results of the pilot study, the questionnaire questions appeared comprehensive and to produce the type of response required answering the research questions. Analysis of the pilot survey also showed that to a large extent management accounting techniques are useful for school management. To broaden the focus, it was decided to obtain the overall views of the respondents concerning their attitude towards the utility of management accounting techniques and the necessity of training in these techniques for school administrators. Therefore, two new questions were added to the questionnaire:

1. Management accounting techniques are useful for my work.
2. I would like to have training in management accounting techniques.

These require the respondents to give their overall opinion.

Please refer to Appendix 3.2 for the final questionnaires used for the study.

### Dispatch of Questionnaires

The questionnaires were dispatched to the main sample in batches starting from December 1998 until July 1999. Reminders were sent after one month if no response was received. As the response rate of particular strata was not favourable, the researcher increased the sample size by sending more questionnaires. (See Table 4.1 in Chapter 4.)
Interview

In my final stages of data collection, interviews were conducted with principals and senior officers. The purpose of the interview was to enable a more in-depth assessment of the ways in which management accounting techniques can be used in schools. It can often put flesh on the bones of questionnaire responses. (Bell 1999).

The other advantages are:

1. Interview is easier to probe in depth than a questionnaire.
2. Interview is more personalised than a questionnaire and provides direct interaction with the interviewee. (William 1988; Bennett 1994; Cohen & Amnion 1994)

The main problem in using the interview method is that very few questionnaire respondents indicated that they were willing to participate in interviews. (See question 15 in Figure 3.2). The draft interview schedule is shown in Appendix 3.3.

Response Rate

As indicated in Chapter 3, the minimum sample size for dispatching the questionnaire was 235. However, due to the poor response rate of some of the subgroups like junior colleges, kindergartens, commercial schools and other institutions, the sample size was increased to 338 in order to obtain a higher response rate. A total of 338 questionnaires were distributed, and 71 (21%) responded. Table 4.1 shows the profile of the respondents.

Analysis of Replies

Tertiary institutions gave the highest response rate: polytechnics (75%), universities (33%). Secondary schools gave the second highest: government-aided secondary (31%), government secondary (25%) and independent secondary schools (33%). Primary schools gave the third highest: government-aided primary (38%), government primary (21%). Among the lowest response rate groups were kindergartens (5%), commercial schools (5%) and computer schools (8%). No replies were received from junior colleges, correspondence schools, tutorial schools and language centres. The
non-replies from junior colleges were due to the principals in junior colleges being too busy or unwillingness to provide information without referring to higher authority.

**Reliability Analysis-Scale (Alpha)**

Using SPSS (Statistical Package for Social Science) to perform the reliability analysis for the questionnaire data, the results give high reliability coefficients, the total scale of all items, alpha = 0.96. Table 4.2 shows the results. The high overall reliability coefficients indicate that the relationships between variables in the survey are highly related and that the results are reliable.

**Conclusion**

From the researcher's observation, management accounting does not manifest itself in educational institutions in Singapore. Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is the research problem addressed by this thesis.

The research will empirically verify the above understanding and establish the extent to which these techniques are used. As the number of Singapore institutions is about one thousand, and accounting information is generally regarded as confidential, postal questionnaires were used as the main survey tool, supplemented by interviews to facilitate a more in-depth assessment. The survey used the stratified sampling method in selecting the sample. A stratified random sample is obtained by separating the population elements into non-overlapping groups, (called strata, i.e. different type of educational institutions), and then selecting a random sample from each stratum. The survey was to examine the extent of the application of management accounting to educational institutions in Singapore and the attitudes of the senior management of these institutions towards the effectiveness of management accounting as a management tool. Based on the results of the pilot study, two new questions were added to the questionnaire for the main study. The revised questionnaires were dispatched to the main sample in batches.
This research using postal questionnaires for data collection remained heavily dependent upon response rate. In order to ensure a high response rate, the distribution and return arrangements are important. Proper procedure and documentation were maintained to ensure that all questionnaires despatched were recorded and followed up. Two reminders were sent to the sample population. The minimum sample size for dispatching questionnaires was 235. However, due to the poor response rate of some of the subgroups like junior colleges, kindergartens and commercial schools, the sample size was increased to 338 in order to obtain a higher response rate and to ensure the sample was representative of the subgroups. The effective use of questionnaires demands a clear understanding of the overall research context to avoid confusion or scepticism in the ultimate analytical interpretation. The questionnaire structure must include all the facilities deemed to be necessary for successful analysis; the data collected are categorised into a form, which facilitates analysis and interpretation. This would be discussed in Chapter 4. Similarly, this research also uses semi-structured interviews to collect data on more in-depth questions to form a triangulation of combination of different survey methods. The recording and analysis of the interview data would be discussed in Chapter 5.
Chapter 4

Presentation of Survey Findings
Chapter 4

Presentation of Survey Findings

As mentioned in the Chapter 1, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is the research problem addressed by this thesis. The research has been designed to study the extent of application of management accounting techniques in Singapore educational institutions and the attitudes of the senior administrator towards the usefulness of the various aspects of management accounting techniques. As the research population is large, first, a postal questionnaire was used to gather the primary information, and then it was followed by interviews to obtain more in-depth information. The attitude statements have been included in the questionnaire. This chapter presents the findings of the questionnaires in the following order: (1) response rate; (2) reliability analysis; (3) data on characteristics of the respondents; (4) data collected on questionnaires for the seven groups of management accounting techniques.

Response Rate

As indicated in Chapter 3, the minimum sample size for dispatching questionnaires was 235. However, due to the poor response rate of some of the subgroups like junior colleges, kindergartens, commercial schools and other institutions, the sample size was increased to 338 in order to obtain a higher response rate. A total of 338 questionnaires were distributed, and 71 (21%) responded.
Table 4.1 shows the profile of the respondents.
<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Sample size</th>
<th>% to total</th>
<th>No.of replies</th>
<th>Reply rate</th>
<th>% of replies to total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tertiary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td>1</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Polytechnic</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td>3</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institute of Technical Education (ITE) Centre</td>
<td>12</td>
<td>3</td>
<td>25%</td>
<td>1</td>
<td>33%</td>
<td>8%</td>
</tr>
<tr>
<td>Part-Time Continuing Education Centre</td>
<td>18</td>
<td>5</td>
<td>28%</td>
<td>1</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Junior College</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior College</td>
<td>9</td>
<td>6</td>
<td>66%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Junior College-Govt.-Aided</td>
<td>5</td>
<td>4</td>
<td>80%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Centralised Institutes</td>
<td>2</td>
<td>1</td>
<td>50%</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Secondary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School-Govt.</td>
<td>107</td>
<td>91</td>
<td>85%</td>
<td>23</td>
<td>25%</td>
<td>21%</td>
</tr>
<tr>
<td>Secondary School-Govt.Aided</td>
<td>32</td>
<td>20</td>
<td>63%</td>
<td>7</td>
<td>31%</td>
<td>22%</td>
</tr>
<tr>
<td>Secondary School-Independent</td>
<td>8</td>
<td>3</td>
<td>38%</td>
<td>1</td>
<td>33%</td>
<td>13%</td>
</tr>
<tr>
<td>Private Regular School</td>
<td>3</td>
<td>1</td>
<td>33%</td>
<td>1</td>
<td>100%</td>
<td>33%</td>
</tr>
<tr>
<td>Foreign System School</td>
<td>30</td>
<td>6</td>
<td>20%</td>
<td>1</td>
<td>17%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Primary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary School-Govt.</td>
<td>147</td>
<td>81</td>
<td>55%</td>
<td>17</td>
<td>20%</td>
<td>12%</td>
</tr>
<tr>
<td>Primary School-Govt.Aided</td>
<td>46</td>
<td>26</td>
<td>57%</td>
<td>10</td>
<td>38%</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Kindergarten</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>95</td>
<td>19</td>
<td>20%</td>
<td>1</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial School</td>
<td>80</td>
<td>20</td>
<td>25%</td>
<td>1</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Computer Education School</td>
<td>61</td>
<td>12</td>
<td>20%</td>
<td>1</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Correspondence School</td>
<td>8</td>
<td>1</td>
<td>13%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine Arts School</td>
<td>69</td>
<td>7</td>
<td>10%</td>
<td>2</td>
<td>29%</td>
<td>3%</td>
</tr>
<tr>
<td>Tutorial School</td>
<td>112</td>
<td>10</td>
<td>9%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week and Centre</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Schools Centre</td>
<td>19</td>
<td>2</td>
<td>10%</td>
<td>1</td>
<td>50%</td>
<td>5%</td>
</tr>
<tr>
<td>Islamic Religious School</td>
<td>9</td>
<td>2</td>
<td>22%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language Schools</td>
<td>72</td>
<td>7</td>
<td>10%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>7</td>
<td>1</td>
<td>14%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>961</td>
<td>338</td>
<td>35%</td>
<td>71</td>
<td>21%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Analysis of Replies

Tertiary institutions gave the highest response rate: polytechnics (75%), universities (33%). Secondary schools gave the second highest: government-aided secondary (31%), government secondary (25%) and independent secondary schools (33%). Primary schools gave the third highest: government-aided primary (38%), government primary (21%). Among the lowest response rate groups were kindergartens (5%), commercial schools (5%) and computer schools (8%). No replies were received from junior colleges, correspondence schools, tutorial schools and language centres. The non-replies from junior colleges were due to the principals in junior colleges being too busy or unwillingness to provide information without referring to higher authority.

Reliability Analysis-Scale (Alpha)

Using SPSS (Statistical Package for Social Science) to perform the reliability analysis for the questionnaire data, the results give high reliability coefficients, the total scale of all items, alpha = 0.96. Table 4.2 shows the results.

Table 4.2 Results of the Reliability Analysis-Scale (Alpha) for the Questionnaire data

<table>
<thead>
<tr>
<th>Groups</th>
<th>Reliability Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 Questions – Q1 to Q1.7 Using Accounting Information to make decisions</td>
<td>0.88</td>
</tr>
<tr>
<td>Group 2 Questions – Q 2 to Q 2.9 - Budgeting</td>
<td>0.80</td>
</tr>
<tr>
<td>Group 3 Questions- Q3.1 to Q 3.5 - Variance Analysis</td>
<td>0.90</td>
</tr>
<tr>
<td>Group 4 Questions – Q 4 to Q 4.4 - Profit Centre / Cost Centre</td>
<td>0.93</td>
</tr>
<tr>
<td>Group 5 Questions - Q 5 to Q 5.6 - Unit costs</td>
<td>0.93</td>
</tr>
<tr>
<td>Group 6 Questions - Q 6.1 to Q 6.4 - Ratio Analysis</td>
<td>0.93</td>
</tr>
<tr>
<td>Group 7 Questions – Q 7.1 to Q. 7.8 - Other Management Accounting Techniques</td>
<td>0.92</td>
</tr>
<tr>
<td>Group 8 Questions - Q 8.1 to Q 8.2 Overall view of usefulness of Management Techniques &amp; Need for Training</td>
<td>0.43</td>
</tr>
<tr>
<td>Overall total scale of all items-Alpha Value</td>
<td>0.96</td>
</tr>
</tbody>
</table>
The high overall reliability coefficients indicate that the relationships between variables in the survey are highly related and that the results are reliable.

**Data on characteristics of the respondents:**

**Sex**

Table 4.3 shows slightly more female (52%) respondents. Since the sex differentiation is not greater than 5%, sex differentiation does not affect the results of the study.

**Table 4.3 Sex**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>1%</td>
</tr>
<tr>
<td>Male</td>
<td>47%</td>
</tr>
<tr>
<td>Female</td>
<td>52%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Age Group**

In Table 4.4, most of the respondents (73%) are in the 41-60 year age range and therefore experienced administrators (i.e. above 41 years old).

**Table 4.4 Age Group**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>3%</td>
</tr>
<tr>
<td>Under 30</td>
<td>8%</td>
</tr>
<tr>
<td>31-40</td>
<td>15%</td>
</tr>
<tr>
<td>41-50</td>
<td>21%</td>
</tr>
<tr>
<td>50-60</td>
<td>51%</td>
</tr>
<tr>
<td>Above 60</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Position**

**Table 4.5 Position**

The respondents Table 4.5 are in senior positions. 78% are principals or owners of the schools/institutions and 21% of them are senior managers.

<table>
<thead>
<tr>
<th>Position</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal/MD/Director</td>
<td>74%</td>
</tr>
<tr>
<td>Owner/Partner/Supervisor</td>
<td>4%</td>
</tr>
</tbody>
</table>
Table 4.6-Type of Organisation

As Table 4.6 shows, the respondents (82%) are from government institutions.

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government or Government aided institute/school</td>
<td>82%</td>
</tr>
<tr>
<td>Statutory Board</td>
<td>7%</td>
</tr>
<tr>
<td>Sole Proprietor/partnership</td>
<td>4%</td>
</tr>
<tr>
<td>Company</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.7-Type of Institute

Table 4.7 shows that most of the respondents (84%) are from the secondary and primary schools.

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary/University</td>
<td>7%</td>
</tr>
<tr>
<td>Junior College</td>
<td>0%</td>
</tr>
<tr>
<td>Secondary</td>
<td>46%</td>
</tr>
<tr>
<td>Primary</td>
<td>38%</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.8-Institutional Enrolment

<table>
<thead>
<tr>
<th>No. of students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1000</td>
<td>21%</td>
</tr>
<tr>
<td>1000-2999</td>
<td>69%</td>
</tr>
<tr>
<td>3000-4999</td>
<td>3%</td>
</tr>
<tr>
<td>5000-7000</td>
<td>0%</td>
</tr>
<tr>
<td>Above 7000</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.8 shows that most of the respondents (69%) are from the institutes/schools with student populations between 1000 and 3000. The tertiary institutions constitute the 7% of institutions with a student population above 7000 (57% of the tertiary institutions). The sample covers widely the main institutions in Singapore: tertiary institutions (100%), technical schools (27%), junior colleges
(69%) secondary schools (40%), primary schools (55%), kindergartens (20%), and commercial schools (15%). This broadly represents the population of Singapore educational institutions.

**Summary of Non-Responses**

Of the 267 which did not complete the questionnaires as requested, 44 (13%) did reply and gave their reasons for not-participating in the survey. These are summarized in Table 4.9.

<table>
<thead>
<tr>
<th>Type</th>
<th>No of non-replies</th>
<th>Change of address</th>
<th>Transferred/retired</th>
<th>Unable to reply</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior College</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td>(1),(2),(3),(6)</td>
</tr>
<tr>
<td>Junior College-Govt.Aided</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>(1),(2),(3)</td>
</tr>
<tr>
<td>Centralised Institutes</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary School-Govt.</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>(1),(3),(5)</td>
</tr>
<tr>
<td>Secondary School-Govt.-Aided</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>(1),(2),(3)</td>
</tr>
<tr>
<td>Primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>(1),(2)</td>
</tr>
<tr>
<td>Primary School-Govt.-Aided</td>
<td>5</td>
<td></td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
<td>(5)</td>
</tr>
<tr>
<td>Commercial Schools</td>
<td>8</td>
<td>7</td>
<td></td>
<td>1</td>
<td>(1)</td>
</tr>
<tr>
<td>Fine Arts Schools</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>(4)</td>
</tr>
<tr>
<td>Foreign System Schools</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>15</td>
<td>5</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

Their reasons for not participating are given below:

(1) No reason is given.
(2) Do not want to participate with no specific reasons given.
(3) No permission was given from a higher authority.
(4) The principal had retired or transferred.
(5) The questionnaire is difficult to understand.
(6) It was time consuming.
As the percentage of non-replies is not significant (13%), this may not constitute a significant impact on the findings; however, it may have a slight impact, as some types of institutions, like junior colleges, kindergartens and commercial schools, did not participate.

**Data Collected from questionnaires**

Besides the responses to close-ended items of the questionnaire, respondents also provided written remarks. These are discussed later in the Chapter.

**The extent of application of management accounting techniques in Singapore**

Based on the research objectives mentioned in Chapter 1, the researcher classified seven groups of management accounting techniques, which may be commonly used by institutions. Questions relating to each group of techniques were incorporated in the questionnaire (See Appendix 3.2).

The purpose of the survey is to empirically verify the extent of application of seven groups of Management Accounting techniques used in Singapore educational institutions and the attitudes of the principals/administrators towards these techniques.

Table 4.10 provides a summary of the percentage of responses against each of the points of the 5-point scale. Regardless of the frequency of usage, the percentages of "usually" and "sometimes" give the best indication of the extent of usage of a group of techniques. The last column shows the ranking of the group of techniques in order of the popularity of the techniques.

**Table 4.10 Summary of the Questionnaire Findings**

<table>
<thead>
<tr>
<th>Groups of Techniques</th>
<th>% of Usually</th>
<th>% of Sometimes</th>
<th>Rarely</th>
<th>NA</th>
<th>Combining % of Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use accounting</td>
<td>34%</td>
<td>24%</td>
<td>32%</td>
<td>10%</td>
<td>58%</td>
<td>4</td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budgeting</td>
<td>68%</td>
<td>20%</td>
<td>10%</td>
<td>2%</td>
<td>88%</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance Analysis</td>
<td>32%</td>
<td>28%</td>
<td>26%</td>
<td>14%</td>
<td>60%</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decentralisation and</td>
<td>36%</td>
<td>18%</td>
<td>11%</td>
<td>35%</td>
<td>54%</td>
<td>5</td>
</tr>
<tr>
<td>setting up Profit/Cost Centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>42%</td>
<td>21%</td>
<td>21%</td>
<td>16%</td>
<td>63%</td>
<td>2</td>
</tr>
</tbody>
</table>
Of the seven groups of techniques, five groups of techniques were rated "Usually or Sometimes" more than 50% of the time. They are: "Budgeting" (88%), "Unit costs" (63%), "Variance analysis" (60%), "Accounting information" (58%) and "Profit/cost centres" (54%). This indicates that "Budgeting" is the most popular tool, though "Unit costs" and "Variance analysis" are popular. "Accounting information" and "profit/cost centres" are commonly used. On the other hand, "Ratio analysis" (35%) and "Other management accounting techniques" (34%), were below 50%, suggesting that they are not commonly used.

Table 4.11 gives a summary of the average responses of the seven groups of questions. It shows that tertiary institutions (above 60%) and others (above 53%) use more management accounting techniques than primary schools (above 30%) and secondary schools (above 27%).

The most common techniques applicable to tertiary institutions are:
- Decentralisation and setting up profit/cost centre (100%)
- Budgeting (96%)
- Ratio analysis (88%)
- Variance analysis (83%)

The most common techniques applicable to other institutions are:
• Budgeting (76%)
• Variance analysis (75%)
• Unit cost (72%)
• Using accounting information (71%)

The most commonly used techniques applicable to primary and secondary schools are:

• Budgeting (above 89%)
• Unit cost (above 56%)

Ratio analysis and other management accounting techniques (below 31%) are less commonly used techniques for primary and secondary schools.

The following provides the findings of each group of questions as specified in the questionnaire.

**Group 1 Questions-What is the extent of using accounting information to make decisions?**

The purpose of group 1 questions is to find out the extent that respondents are using accounting information to make decisions on expenditure control, cash flow planning, evaluation performance and determination of whether to start a new class or programme.

Table 4.12 shows the responses of the respondents, which are ranked in the last column based on the highest percentage of "usually & sometimes".

**Table 4.12 Group 1 Questions - Accounting Information**

<table>
<thead>
<tr>
<th></th>
<th>Have you ever made use of accounting information to make decisions on:</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>Control the expenditure of your institute/school.</td>
<td>63%</td>
<td>20%</td>
<td>10%</td>
<td>7%</td>
<td>83%</td>
<td>1</td>
</tr>
<tr>
<td>1.6</td>
<td>Spend on capital expenditure.</td>
<td>57%</td>
<td>24%</td>
<td>11%</td>
<td>8%</td>
<td>81%</td>
<td>2</td>
</tr>
<tr>
<td>1.7</td>
<td>Plan cash flow requirements</td>
<td>47%</td>
<td>25%</td>
<td>18%</td>
<td>10%</td>
<td>72%</td>
<td>3</td>
</tr>
<tr>
<td>1.1</td>
<td>Evaluate the performance of your institute/school.</td>
<td>23%</td>
<td>31%</td>
<td>37%</td>
<td>10%</td>
<td>54%</td>
<td>4</td>
</tr>
<tr>
<td>1.4</td>
<td>Determine whether to start a new class or a new programme.</td>
<td>23%</td>
<td>25%</td>
<td>42%</td>
<td>10%</td>
<td>48%</td>
<td>5</td>
</tr>
<tr>
<td>1.3</td>
<td>Evaluate the performance of one division by comparing it with another division in your institute/school</td>
<td>14%</td>
<td>30%</td>
<td>46%</td>
<td>10%</td>
<td>44%</td>
<td>6</td>
</tr>
<tr>
<td>1.2</td>
<td>Evaluate the profitability of your institute/school.</td>
<td>14%</td>
<td>10%</td>
<td>63%</td>
<td>13%</td>
<td>24%</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>34%</td>
<td>24%</td>
<td>32%</td>
<td>10%</td>
<td>58%</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.13 below shows the percentage of "Usually" & "Sometimes" by types of schools/institutions.

**Table 4.13 Analysis of the Question 1 results by type of institution**

<table>
<thead>
<tr>
<th></th>
<th>Have you ever made use of accounting information to make decisions on to:</th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>Control the expenditure of your institute/schools.</td>
<td>83%</td>
<td>75%</td>
<td>84%</td>
<td>89%</td>
<td>67%</td>
</tr>
<tr>
<td>1.6</td>
<td>Spend on capital expenditure.</td>
<td>80%</td>
<td>75%</td>
<td>81%</td>
<td>82%</td>
<td>78%</td>
</tr>
<tr>
<td>1.7</td>
<td>Plan cash flow requirements</td>
<td>71%</td>
<td>75%</td>
<td>67%</td>
<td>74%</td>
<td>88%</td>
</tr>
<tr>
<td>1.1</td>
<td>Evaluate the performance of your institute/school</td>
<td>54%</td>
<td>75%</td>
<td>49%</td>
<td>46%</td>
<td>78%</td>
</tr>
<tr>
<td>1.4</td>
<td>Determine whether to start a new class or a new programme.</td>
<td>48%</td>
<td>75%</td>
<td>38%</td>
<td>49%</td>
<td>67%</td>
</tr>
<tr>
<td>1.3</td>
<td>Evaluate the performance of one division by comparing it with another division in your institute/school</td>
<td>44%</td>
<td>75%</td>
<td>45%</td>
<td>30%</td>
<td>66%</td>
</tr>
<tr>
<td>1.2</td>
<td>Evaluate the profitability of your institute/school.</td>
<td>24%</td>
<td>10%</td>
<td>19%</td>
<td>18%</td>
<td>56%</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>58%</td>
<td>68%</td>
<td>55%</td>
<td>55%</td>
<td>71%</td>
</tr>
</tbody>
</table>

Using accounting information is the fourth most popular management accounting tool (58%) used in Singapore educational institutions. As indicated in table 4.12, accounting information is commonly used to control expenditure (81%), to control capital expenditure (83%), to plan cash flow (72%) and to evaluate performance (54%), but some respondents may not familiar with the technique. This can be illustrated by their remarks:

One principal asked:

"What is accounting information?"

Another remarked:

"Accounting information is not applicable."

This indicates that some principals/administrators do not have much accounting knowledge. It indicates that training for basic accounting is required. As 82% of the respondents are from not-for-profit government or government-aided
schools, some respondents felt that accounting information may not be relevant to them. This is indicated in their remarks:

"Our school is a non-profit organization".

"Since we are not a private school, most of your Qs do not apply to us".

**Control the Expenditure**

The study shows that 83% of respondents use accounting information to control expenditure, while 81% of respondents use it to make decisions for capital expenditure.

One respondent claimed:

"Using accounting information to forecast for the expenditure pattern."

This shows that he is familiar with using accounting information as a working tool. The study also shows that over 80% of secondary and primary schools usually or sometimes use accounting information to control expenditure and capital expenditure. The use of accounting information for tertiary and other institutions is slightly lower (68% to 78%). This may be due to tertiary institutions and other institutions being given autonomous status to manage their resources while the secondary and primary schools are still centrally controlled.

**Planning Cash flow**

72% of respondents use accounting information to plan for cash flow requirement. 88% of other institutions and 75% of tertiary institutions use it to plan cash flow, while usage among secondary and primary schools is slightly lower (i.e. 67%, 74% respectively). This shows that cash flow management is more important to tertiary and other institutions, which are more autonomous and more concerned with efficient use of funds, while secondary and primary schools are still centrally controlled.

**Evaluate the Institution/School Performance**
54% of the respondents make use of accounting information to evaluate the performance of their institutions/schools. 37% of them rarely make use of it to evaluate performance. This may be illustrated by their remarks:

As one principal put it:

"Since we are Government schools funded by Government, financial performance is not important."

Another illustrated:

"We are not a profit-making organisation, financial performance is not important."

Usage by tertiary and other institutions is higher e.g. 75% to 88%. This may due to tertiary and other institutions being accountable for their financial performance, while the Government funds government or government-aided secondary and primary schools.

Determining whether to Start a Class or a Programme

48% of the respondents make use of accounting information to determine whether to start a new class or a new programme. 42% of them rarely make use of this information. 10% of respondents do not give any opinion. One respondent said:

"To start a new class depends on needs."

This indicates that accounting information is not the only criteria for making such a decision. 75% of tertiary institutions and 67% of other institutions use it to determine whether to start or to drop a class or programme, while the usage of accounting information for secondary and primary schools is much lower (38%, 49% respectively). This may due to tertiary institutions and other institutions being more concerned with the financial efficiency of a programme to prevent wastage. The government or government-aided secondary and primary schools place less emphasis on financial efficiency.
Evaluate the Performance of a Division

44% of the respondents use accounting information to evaluate the performance of one division by comparing it with another division. 56% of them rarely make use of this information. 10% of respondents do not give any opinions. This may be because most of the respondents (82%) are from government and government-aided secondary and primary schools. 75% of tertiary institutions and 66% of other institutions usually or sometimes use it to evaluate the performance of a division, while usage among secondary and primary schools is much lower (i.e. 45%, 30% respectively). This may be because tertiary institutions and other institutions are more concerned with the financial efficiency of divisions to prevent wastage. While government or government-aided secondary and primary schools may place less emphasis on financial efficiency. In addition, they are also less structurally complicated than tertiary and other institutions.

Evaluate the profitability of the institutions

Profit is the difference between output (revenue) and input (expenses). It is an important overall measure of effectiveness and efficiency. At best, profit is a measure of what has happened in the short run, whereas we are also interested in the long-run consequences of management action, especially in education.

Only 24% of the respondents use accounting information to evaluate the profitability of the institutions. 63% of the respondents rarely use it to evaluate the profitability and 13% of them never use it. It seems that some respondents are not concerned with the profitability of their institutions. This is explained by one principal's remark:

"Our school is a non-profit organization."

In contrast, 56% of the respondents from other institutions usually or sometimes use accounting information to evaluate the profitability of the institutions, as they are accountable for profitability while most of the respondents from tertiary institutions (10%), secondary (19%) and primary (18%) schools are not.
Group 2 Questions: What is the extent of using budgetary systems?

The purpose of the group 2 questions is to find out the extent to which budgeting is applied to Singapore educational institutions, and the attitudes of the principals/administrators towards these techniques. Table 4.15 shows the responses of the respondents, which are ranked, in the last column based on the highest percentage of “usually & sometimes”.

Table 4.14 Budgeting

<table>
<thead>
<tr>
<th>2</th>
<th>Is budgeting useful for controlling expenditure and allocating resources?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>NA</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td></td>
<td>93%</td>
<td>4%</td>
<td>3%</td>
<td>0%</td>
<td>97%</td>
<td>1</td>
</tr>
<tr>
<td>2.2</td>
<td>Is budgeting useful for planning your operations/programmes?</td>
<td>90%</td>
<td>6%</td>
<td>4%</td>
<td>0%</td>
<td>96%</td>
<td>2</td>
</tr>
<tr>
<td>2.5</td>
<td>Does budgeting assist in the coordination of activities of all departments?</td>
<td>73%</td>
<td>23%</td>
<td>4%</td>
<td>0%</td>
<td>96%</td>
<td>2</td>
</tr>
<tr>
<td>2.1</td>
<td>Are you involved in the preparation of the budget?</td>
<td>95%</td>
<td>1%</td>
<td>4%</td>
<td>0%</td>
<td>96%</td>
<td>2</td>
</tr>
<tr>
<td>2.9</td>
<td>Budgeting is useful for my daily operations.</td>
<td>66%</td>
<td>28%</td>
<td>4%</td>
<td>2%</td>
<td>94%</td>
<td>4</td>
</tr>
<tr>
<td>2.8</td>
<td>Is budgeting useful for linking organisational objectives to strategic planning?</td>
<td>63%</td>
<td>31%</td>
<td>4%</td>
<td>1%</td>
<td>94%</td>
<td>4</td>
</tr>
<tr>
<td>2.3</td>
<td>Is budgeting a useful means of asking for additional funding?</td>
<td>77%</td>
<td>14%</td>
<td>4%</td>
<td>4%</td>
<td>91%</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Does your institute/school prepare a budget annually? or periodically?</td>
<td>80%</td>
<td>1%</td>
<td>3%</td>
<td>16%</td>
<td>81%</td>
<td>7</td>
</tr>
<tr>
<td>2.6</td>
<td>Can budgeting be used to motivate staff?</td>
<td>32%</td>
<td>41%</td>
<td>27%</td>
<td>0%</td>
<td>73%</td>
<td>10</td>
</tr>
<tr>
<td>2.7</td>
<td>Does budgeting create unhappiness among staff?</td>
<td>8%</td>
<td>48%</td>
<td>42%</td>
<td>1%</td>
<td>56%</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>68%</td>
<td>20%</td>
<td>10%</td>
<td>2%</td>
<td>88%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.15 shows the percentage of "usually" & "sometimes" for Question 2 by type of institutions/schools:

Table 4.15 Analysis of the Question 2 results by type of institutions/schools

<table>
<thead>
<tr>
<th>2</th>
<th>Is budgeting useful for controlling expenditure and allocating resources?</th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td></td>
<td>97%</td>
<td>100%</td>
<td>97%</td>
<td>100%</td>
<td>89%</td>
</tr>
</tbody>
</table>

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## Preparation of Budget

The budget is one of the four steps in the formal management control process (Anthony and Herzlinger, 1989). 95% of the respondents in this survey are involved in preparing the budget. 81% of the respondents prepare budgets annually or periodically. This indicates that budgeting is an important management tool for the principals/administrators in Singapore educational institutions. In tertiary institutions, government and government-aided schools, budgeting is a standard administrative requirement.

One principal said:

"It is compulsory for schools to have a budget. No Budget-no money released from MOE."

100% of the respondents from tertiary institutions and primary schools prepare budgets, and only 97% and 89% of the respondents from primary schools and other institutions do so. As mentioned earlier, this indicated that for a small number of small private schools, budgeting might not be an important administrative practice.
**Budgeting for Daily Operations**

95% of the respondents think that budgeting usually or sometimes is useful for their daily work. One principal said:  
"Budgeting enhances financial control and knowing the urgent needs of the school."

Only 4% of them rarely use budgeting for their work. These could be the small private schools which do not required funding from the authority. 100% of respondents from tertiary institutions think that it is useful for daily operation and most of the respondents from secondary (94%) and primary schools (96%) and other institutions (89%) agree with this statement.

**Control of Expenditure**

The study shows that most of the respondents (97%) usually or sometimes, use budgeting to control expenditure. 100% of respondents from tertiary institutions usually or sometimes use budgeting to control expenditure, while only 97% respondents from secondary schools and 89% from other institutions do so.

**Planning for Operations/Programmes**

Arnold and Hope (1989) said that the budget is a process integral to (1) the planning process (2) the control process and (3) a device for motivation. Most of the respondents (96%) felt that budgeting is useful for planning. Only 4% of them rarely use it. 100% of the respondents from tertiary institutions usually or sometimes use budgeting to control expenditure, while only 97% of the respondents from secondary schools and 89% from the other institutions do so.

**Coordination of Activities of all Departments**

96% of the respondents think budgeting assists in coordinating the activities of all departments. Only 4% of them rarely use it. 100% of the respondents from tertiary institutions usually or sometimes use budgeting to control expenditure,
while only 94% of the respondents from secondary schools and 66% from the other institutions do so.

**Linking Organisational Objectives to Strategic Planning**

Glover (1997) said that there is a need for a link between educational objectives and the resource patterns to achieve organisational objectives and the budget makes possible the achievement of these objectives. Strategic planning can be considered as a framework with forward budget plans. 94% of the respondents think that budgeting is useful for linking organisational objectives to strategic planning. Only 4% of them rarely use it. 100% of the respondents from tertiary institutions and primary schools usually or sometimes use budgeting to control expenditure, while only 97% respondents from secondary schools and 78% from other institutions do so.

**A Means of Asking for Additional Funding**

The budgeting process is a dynamic one with competing forces vying for funds to meet differing expenditure needs. 91% of the respondents think that budgeting is a useful means of asking for additional funds. 4% of respondents rarely use it; these could be private schools, which cannot ask for funds from the authority.

This is reflected in their remarks:

"Q2.3- Not Applicable, as we are not funded."

100% of the respondents from tertiary institutions and primary schools usually or sometimes use budgeting to control expenditure, while only 90% of respondents from secondary schools and 89% from other institutions do so.

**Budgeting Motivates Staff or Creates Unhappiness**

Arnold and Hope (1989) said that all budgeting processes involve relationships between people. Thus budgeting entails behavioural change. 73% of the respondents think that budgeting usually or sometimes motivates staff, but 56%
of the respondents also think that budgeting also usually or sometimes creates unhappiness among staff members. It seems that budgeting generally motivates staff members even though it also creates unhappiness amongst them. Most of the respondents from tertiary institutions (75%), secondary (81%) and primary schools (78%) think that budgeting can motivate staff members. As to creating unhappiness, most of the respondents from tertiary institutions (75%) and other institutions (78%) think that it also creates unhappiness. However, only 52% of respondents from secondary and primary schools agree with the statement.

Group 3 Questions — What is the extent of using variance analysis and standard costing?

The difference between budgeted and actual performance is termed "variance". Variance analysis is a skill of interpretation and many writers suggest that this could provide feedback for the control system. Group 3 questions aim to find out the extent that respondents are using variance analysis techniques to control expenditure, highlight problems, and evaluate performance.

Table 4.16 shows the responses of the respondents, which are ranked, in the last column based on the highest percentage of "usually & sometimes."

Table 4.16 Group 3 Questions — Variance Analysis

<table>
<thead>
<tr>
<th></th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>&quot;When the actual income or expenditure is higher or lower than the budgeted income/expenditure, do you have to give reasons to explain the difference or the variance?&quot;</td>
<td>39%</td>
<td>34%</td>
<td>17%</td>
<td>10%</td>
<td>73%</td>
</tr>
<tr>
<td>3.3</td>
<td>Variance analysis is useful to highlight the problem.</td>
<td>34%</td>
<td>35%</td>
<td>20%</td>
<td>11%</td>
<td>69%</td>
</tr>
<tr>
<td>3.1</td>
<td>Variance analysis is useful to control over-spending.</td>
<td>54%</td>
<td>14%</td>
<td>20%</td>
<td>12%</td>
<td>68%</td>
</tr>
<tr>
<td>3.5</td>
<td>Variance analysis is useful for my daily operations.</td>
<td>25%</td>
<td>35%</td>
<td>27%</td>
<td>13%</td>
<td>60%</td>
</tr>
<tr>
<td>3.4</td>
<td>Standard Costing is useful to monitor performance.</td>
<td>23%</td>
<td>34%</td>
<td>28%</td>
<td>15%</td>
<td>57%</td>
</tr>
<tr>
<td>3.2</td>
<td>Variance analysis is helpful to monitor sales promotion effort.</td>
<td>17%</td>
<td>15%</td>
<td>44%</td>
<td>24%</td>
<td>32%</td>
</tr>
<tr>
<td>Average</td>
<td>32%</td>
<td>28%</td>
<td>26%</td>
<td>14%</td>
<td>60%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Table 4.17 shows the percentage of "Usually" & "Sometimes" for Question 3 by types of institutions/schools:

**Table 4.17 Analysis of the Question 3 results by type of institutions/schools**

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>When the actual income or expenditure is higher or lower than the budgeted, income/expenditure, do you have to give reasons to explain the difference or the variance?</td>
<td>73%</td>
<td>100%</td>
<td>80%</td>
<td>71%</td>
</tr>
<tr>
<td>3.3</td>
<td>Variance analysis is useful to highlight the problem.</td>
<td>69%</td>
<td>100%</td>
<td>65%</td>
<td>59%</td>
</tr>
<tr>
<td>3.1</td>
<td>Variance analysis is useful to control over-spending.</td>
<td>68%</td>
<td>100%</td>
<td>61%</td>
<td>59%</td>
</tr>
<tr>
<td>.5</td>
<td>Variance analysis is useful for my daily operations.</td>
<td>60%</td>
<td>100%</td>
<td>58%</td>
<td>48%</td>
</tr>
<tr>
<td>3.4</td>
<td>Standard Costing is useful to monitor performance.</td>
<td>57%</td>
<td>75%</td>
<td>52%</td>
<td>44%</td>
</tr>
<tr>
<td>3.2</td>
<td>Variance analysis is helpful to monitor sales promotion effort.</td>
<td>32%</td>
<td>25%</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td>Average</td>
<td>60%</td>
<td>83%</td>
<td>58%</td>
<td>52%</td>
<td>75%</td>
</tr>
</tbody>
</table>

**Variance explanation**

73% of respondents usually or sometimes need to give reasons to explain the variance, while 27% of respondents need not do so. As indicated below, this may be due to the fact that fewer other institutions are required to explain variance. All respondents from tertiary institutions (100%) and most of the respondents from secondary schools (80%) and primary schools (71%) are required to give variance explanation. As the other institutions are not government related and less formally structured, only 51% of them are required to give variance explanation.

**To Highlight Problems**

Variance analysis should be incorporated in the technique of "management by exception (MBE)" , which assumes that everything is on target unless it is reported not to be (Ward, Srikanthan and Neal, 1991). 69% of respondents think that variance analysis is usually or sometimes useful to highlight problems. However 20% of them rarely make use of this technique, and 11% of them never do so. 100% of the respondents from tertiary institutions and 88% of the respondents
from other institutions usually or sometimes use variance analysis to highlight problems, while 65% of the respondents from secondary schools and 59% from primary schools do so.

To Control Over-spending

Knight (1993) said that variance shows a trend. This is caused by a change in the planned volume of goods and services supplied. It may be possible to control the use of this item so that its volume reverts to or near to the planned level. 68% of respondents usually or sometimes think that variance analysis is useful to control over-spending, while 20% of them do not think so. This may be because they do not know how to use the technique. This is reflected in their remarks:

One principal claimed:
"Do not understand the use of variance analysis".

Another responded:
"Not familiar with the concept - Explanation required".

100% of the respondents from tertiary institutions and 89% of the respondents from other institutions usually or sometimes use variance analysis to control over-spending, while 61% respondents from secondary and 59% from primary schools do so.

Useful for Daily Operation

60% of respondents think that variance analysis is usually or sometimes useful for their daily work, while 40% of them rarely or never use it. This may be due to their unfamiliarity with the technique. This is reflected in their remarks:

"Not relevant to my work".

"Not familiar with concept- Explanation required."

"Variance analysis and costing is useful only in the manufacturing industry and not the service industry."

100% of the respondents from tertiary institutions and 77% of the respondents from other institutions usually or sometimes consider that variance
analysis is useful for daily work, while 58% respondents from secondary schools and 48% from primary schools do so.

**Standard Costing for Monitor Performance**

Standard costing is an important means for budgeting and formula funding for schools. A standard cost is the level of cost, which should be incurred for any given level of activity (Levacic, 1989). The standard cost of a school (or college) of efficient size for its sector would be built up and determined. 57% of respondents usually or sometimes use standard costing to monitor performance. This shows that many of the principals/administrators are still not familiar with the system. This is reflected in one principal's remarks:

"Q3.4-unable to answer as I have no idea how standard cost works".

75% of the respondents from tertiary institutions and 86% of the respondents from other institutions usually or sometimes use standard costing to monitor performance, while 52% of the respondents from secondary schools and 44% from primary schools do so.

**To Monitor Sales Promotion Effort**

Only 32% of respondents usually or sometimes use variance analysis to monitor sales promotion efforts, while most of them (68)% seldom or never used it. This may be because government schools do not have sales promotion. This is reflected in one principal’s remarks:

"We do not do sales".

25% of the respondents from tertiary institutions and 44% of the respondents from other institutions usually or sometimes use variance analysis to monitor sales promotion efforts, while 32% of the respondents from secondary schools and 26% from primary schools do so. The higher usage for other institutions indicates that they are required to monitor sales performance.
Group 4 Questions - What is the extent of using decentralisation and setting up profit / cost centres?

Decentralised resource management derives from the belief that there are limits to the decision-making capacity of senior management in an organisation. It recognizes the importance of involving managers at all levels in the organisation in decision making and moves certain decisions to the lowest possible level. Responsibility centres are usually either cost centres or profit centres. Managers in charge of a profit centre or cost centre are responsible for the profits and costs in their section. The system has the advantage of allowing responsible officials to react speedily to any changes in their own area of responsibility and allows corrective action to be taken.

Group 4 questions are designed to find out the extent to which respondents use decentralisation, profit centre/cost centre to allocate resources, control expenditure and cost and monitor revenue.

Table 4.18 shows the responses of the respondents, which are ranked, in the last column based on the highest percentage of "usually & sometimes":

<table>
<thead>
<tr>
<th></th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>Cost centre assists in allocating resources.</td>
<td>49%</td>
<td>14%</td>
<td>7%</td>
<td>30%</td>
<td>63%</td>
</tr>
<tr>
<td>4.3</td>
<td>Cost centre makes managers careful in their expenditure.</td>
<td>48%</td>
<td>15%</td>
<td>7%</td>
<td>30%</td>
<td>63%</td>
</tr>
<tr>
<td>4</td>
<td>Is decentralisation and setting up cost centres useful to control cost?</td>
<td>31%</td>
<td>21%</td>
<td>11%</td>
<td>37%</td>
<td>52%</td>
</tr>
<tr>
<td>4.2</td>
<td>Profit centre gives the manager more responsibility and innovation.</td>
<td>30%</td>
<td>17%</td>
<td>14%</td>
<td>39%</td>
<td>47%</td>
</tr>
<tr>
<td>4.1</td>
<td>Profit centre is useful for accounting for revenue.</td>
<td>23%</td>
<td>21%</td>
<td>17%</td>
<td>39%</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>36%</strong></td>
<td><strong>18%</strong></td>
<td><strong>11%</strong></td>
<td><strong>35%</strong></td>
<td><strong>54%</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.19 Analysis of the Group 4 Questions results by types of institutions/schools

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>Cost centre assists in allocating resources.</td>
<td>63%</td>
<td>100%</td>
<td>58%</td>
<td>63%</td>
</tr>
<tr>
<td>4.3</td>
<td>Cost centre makes managers careful in their expenditure.</td>
<td>63%</td>
<td>100%</td>
<td>58%</td>
<td>63%</td>
</tr>
<tr>
<td>4</td>
<td>Is decentralisation and setting up cost centres useful to control cost?</td>
<td>52%</td>
<td>100%</td>
<td>45%</td>
<td>45%</td>
</tr>
<tr>
<td>4.2</td>
<td>Profit centre gives the manager more responsibility and innovation.</td>
<td>47%</td>
<td>100%</td>
<td>39%</td>
<td>45%</td>
</tr>
<tr>
<td>4.1</td>
<td>Profit centre is useful for accounting for revenue.</td>
<td>44%</td>
<td>100%</td>
<td>32%</td>
<td>45%</td>
</tr>
<tr>
<td>Average</td>
<td>54%</td>
<td>100%</td>
<td>46%</td>
<td>52%</td>
<td>64%</td>
</tr>
</tbody>
</table>

Cost centre assists in allocating resources

The objective of cost centre accounting is to identify where surpluses and deficits are being made within the organisation. (Tomkins & Mawditt, 1994). 63% of the respondents think that cost centre is useful in allocating resources. However more than 37% of the respondents either rarely (7%) or never (30%) use it. 100% of the respondents from tertiary institutions and 66% of the respondents from other institutions usually or sometimes use cost centre techniques to allocate resources, while the usage of secondary and primary schools is slightly lower (i.e. 58%, 63% respectively).

Cost Centre Makes Managers Careful in Expenditure

3% of the respondents thought that cost centre usually or sometimes makes managers more careful in their expenditure, while 7% of them rarely use it and 30% of the respondents never use it. 100% of the respondents from tertiary institutions and 66% of the respondents from other institutions usually or sometimes felt that cost centre makes managers careful in their expenditure, while only 58% of the respondents from secondary schools and 63% from primary schools think so.

Decentralisation/Cost Centre to Control Cost
Decentralised management is expected to provide both the motivation and the means for those actually working at the production end of the organisation to improve the quality of what they do. Financial management is strengthened by the participation of the departmental or local manager (Levacic, 1992). 52% of respondents think that cost centre is usually or sometimes useful to control cost. 11% of them rarely think so. 37% of the respondents never use decentralisation/cost centre to control cost. 100% of the respondents from tertiary institutions and 77% of the respondents from other institutions usually or sometimes think that this structure is useful to control cost. Only 45% of the respondents from secondary and primary schools agree with this statement.

**Profit Centre Gives More Responsibility and Innovation**

Knight (1993) stated that cost centre and profit centre help to establish management accountability and responsibility. The cost centre is responsible for its own budget and all expenditure incurred is debited to it. 47% of the respondents think that profit centre usually or sometimes makes managers more responsible and innovative, while 53% of the respondents either rarely (14%) or never (39%) use it. 100% of the respondents from tertiary institutions and 55% of the respondents from other institutions usually or sometimes think that profit centre gives managers more responsibility and innovation, while only 39% of the respondents from secondary schools and 45% from primary schools think so.

**Profit Centre is Useful for Accounting for Revenue**

A profit centre structure helps to provide a clear picture to top management of where in the group the overall profit is being made. The psychological advantage of a profit centre structure is that of giving a person more responsibility and freedom to act, encouragement to use his resources as efficiently as possible and to seek increased revenues in order to improve performance (Tomkins & Mawditt, 1994). Only 44% of the respondents think that the profit centre is usually or sometimes useful for accounting for revenue, while 17% of them rarely think so and 39% of the respondents never use it. 100% of the respondents from tertiary
institutions and 55% of the respondents from other institutions think that profit centre is usually or sometimes useful for accounting for revenue, while only 32% of the respondents from secondary schools and 45% from primary schools think so.

**Group 5 Questions- What is the extent of using unit costs and unit income?**

Unit cost is the second most popular management accounting technique. 63% of respondents use it. Group 5 questions are to find out the extent to which respondents use unit costs/unit fee to control over-spending, cash flow planning and performance evaluation. On the other hand, some respondents do not make use of this technique due to their own requirements. This is reflected in their remarks:

- "Not applicable for diploma course,"
- "Q5 will not apply so much to Government. School,"
- "Our school is a non-profit organisation."
- "We are providing education to the deaf, it cannot depend on cost effectiveness."

Table 4.20 shows the responses of the respondents, which are ranked in the last column based on the highest percentage of "usually & sometimes".

**Table 4.20 Group 5 Questions- Unit Cost**

<table>
<thead>
<tr>
<th></th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>Unit cost is helpful in controlling over-spending.</td>
<td>59%</td>
<td>13%</td>
<td>17%</td>
<td>11%</td>
<td>72%</td>
</tr>
<tr>
<td>5.2</td>
<td>Unit cost assists in deciding on when to run, expand or drop courses.</td>
<td>47%</td>
<td>24%</td>
<td>15%</td>
<td>14%</td>
<td>71%</td>
</tr>
<tr>
<td>5.3</td>
<td>Unit cost assists in evaluating alternative delivery methods.</td>
<td>41%</td>
<td>28%</td>
<td>17%</td>
<td>14%</td>
<td>69%</td>
</tr>
<tr>
<td>5.1</td>
<td>Unit cost is useful for pricing a course.</td>
<td>54%</td>
<td>14%</td>
<td>18%</td>
<td>14%</td>
<td>68%</td>
</tr>
<tr>
<td>5.7</td>
<td>Unit cost is useful in setting targets and monitoring performance.</td>
<td>39%</td>
<td>27%</td>
<td>20%</td>
<td>14%</td>
<td>66%</td>
</tr>
</tbody>
</table>
5.5 Unit cost measures the relative profitability and efficiency of a course. 

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>37%</td>
<td>28%</td>
<td>18%</td>
<td>17%</td>
<td>65%</td>
<td>17%</td>
</tr>
</tbody>
</table>

5.6 Unit cost is helpful to monitor my sales promotion efforts.

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>21%</td>
<td>14%</td>
<td>33%</td>
<td>32%</td>
<td>35%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Average 42% 21% 21% 16% 63%

Table 4.21 shows the percentage of "Usually" & "Sometimes" for Question 3 by types of institutions/schools:

Table 4.21 Analysis of the Question 5 results by types of institutions/schools

<table>
<thead>
<tr>
<th>5</th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4 Unit cost is helpful in controlling over-spending.</td>
<td>59%</td>
<td>75%</td>
<td>61%</td>
<td>52%</td>
<td>67%</td>
</tr>
<tr>
<td>5.2 Unit cost assists in deciding on when to run, expand or drop courses.</td>
<td>47%</td>
<td>25%</td>
<td>48%</td>
<td>41%</td>
<td>78%</td>
</tr>
<tr>
<td>5.3 Unit cost assists in evaluating alternative delivery methods.</td>
<td>41%</td>
<td>25%</td>
<td>39%</td>
<td>41%</td>
<td>77%</td>
</tr>
<tr>
<td>5.1 Unit cost is useful for pricing a course.</td>
<td>54%</td>
<td>50%</td>
<td>58%</td>
<td>41%</td>
<td>77%</td>
</tr>
<tr>
<td>5 Have you ever made use of unit cost to give you a quick evaluation of the financial performance of your course?</td>
<td>40%</td>
<td>100%</td>
<td>42%</td>
<td>30%</td>
<td>66%</td>
</tr>
<tr>
<td>5.7 Unit cost is useful in setting targets and monitoring performance.</td>
<td>39%</td>
<td>75%</td>
<td>42%</td>
<td>26%</td>
<td>78%</td>
</tr>
<tr>
<td>5.5 Unit cost measures the relative profitability and efficiency of a course.</td>
<td>37%</td>
<td>75%</td>
<td>39%</td>
<td>26%</td>
<td>77%</td>
</tr>
<tr>
<td>5.6 Unit cost is helpful to monitor my sales promotion efforts.</td>
<td>21%</td>
<td>0%</td>
<td>32%</td>
<td>7%</td>
<td>55%</td>
</tr>
<tr>
<td>Average</td>
<td>42%</td>
<td>53%</td>
<td>45%</td>
<td>33%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Unit Cost Controls Over-spending

Unit cost seeks to measure the cost of the output. Outputs are related to objectives or purposes in term of products or services. Control is to ensure the actual cost is lower than budgeted unit cost. 72% of the respondents think that unit cost is usually or sometimes helpful to control spending. 17% of the respondents rarely think so, and 11% of them never think that unit cost can control over-spending. The usage of unit cost for controlling over-spending is quite popular among all institutions. 75% of the respondents from tertiary institutions and 67% of
the respondents from other institutions use it to control cost, while 61% of them from secondary schools and 52% from primary schools do so.

**Determine whether to run or to drop a Course**

71% of the respondents usually or sometimes use unit cost to decide on when to run, expand or drop a course, while 15% of them rarely do so. Unit costs can serve as a benchmark for inter-college comparison and to provide standard unit cost and unit revenue profiles for management information. 78% of the respondents from the other institutions usually or sometimes use unit cost to determine whether to start or to drop a class or programme, while the usage for secondary and primary schools and tertiary institutions is much lower (i.e. 48%, 41%, 25% respectively).

**Evaluating Alternative Delivery Methods**

69% of the respondents usually or sometimes use unit cost to evaluate alternative delivery methods of a course, while 17% of them rarely do so. 77% of the respondents from other institutions usually or sometimes use unit cost to evaluate alternative delivery methods for a course, while the usage for secondary and primary schools and tertiary institutions is much lower (i.e. 39%, 41% and 25% respectively).

**Pricing a course**

Carr (1997) said that unit cost data is essential for pricing products and services, measuring the relative profitability of products and services and establishing measures of efficiency. 68% of the respondents usually or sometimes use unit cost to price a course, while 18% of them rarely use it for pricing and 15% of them never do so. 50% of the respondents from tertiary institutions, 78% of the respondents from other institutions and 58% from secondary schools usually or sometimes use unit cost to price a course, while the usage of primary schools is lower (i.e. 41%).

**Quick Evaluation of a Course**
61% of the respondents usually or sometimes use unit cost as a quick evaluation of the financial performance of a course, while 25% of them rarely use it and 15% of them never do so. Unit cost assists in measuring profitability and establishing efficiency, but unit cost does not measure the quality of a course. 100% of the respondents from tertiary institutions and 66% of the respondents from other institutions usually or sometimes use unit cost to evaluate the financial performance of a course, while the usage for secondary and primary schools is much lower (i.e. 42% and 30% respectively).

Setting Targets and Monitoring Performance

Jones (1989) used optimum unit cost, the minimum unit cost that one can reasonably be expected to attain, as a measurement of setting targets and measuring actual performance against them. Agreements about optimum performance parameters are established through negotiation between the principals and each head of department individually. 66% of the respondents usually or sometimes use unit cost to set targets and monitor performance, while 34% of them either rarely (20%) or never (14%) do so. 75% of the respondents from tertiary institutions and 78% of the respondents from other institutions usually or sometimes use it to set targets and monitor performance, while the usage of secondary and primary schools is much lower (i.e. 42%, 26% respectively).

Measure Profitability and Efficiency

65% of the respondents usually or sometimes use unit cost to measure profitability of a course. 35% of them either rarely (18%) or never (17%) do so. 75% of the respondents from tertiary institutions and 77% of the respondents from other institutions usually or sometimes use it to set targets and monitor performance. The usage of secondary and primary schools is much lower (i.e. 39%, 26% respectively).

Monitor Sales Promotion Efforts
35% of the respondents usually or sometimes use unit cost to monitor sales promotion effort. 65% of them either rarely (33%) or never (32%) do so. 55% of the respondents from other institutions usually or sometimes use unit cost to monitor sales promotion efforts, while the usage of secondary and primary schools is much lower (i.e. 37%, 7% respectively). No respondents from tertiary institutions use it to monitor sales promotion efforts.

**Group 6 questions - What is the extent of using ratio analysis?**

Ratio analysis is the technique for interpreting information by comparing one item of statistics with another item. It is only a guide and must always be used in conjunction with other information of comparable nature. Numerous ratios can be employed to compare efficiency of a school’s operation. For effective application of this technique, school principals and administrators should receive training. Group 6 questions aim to find out the extent of using ratio analysis to control expenditure, to make decisions and to evaluate performance.

Table 4.22 shows the responses of the respondents, which are ranked in the last column based on the highest percentage of "usually & sometimes":

**Table 4.22 Group 6 Questions-Ratio Analysis**

<table>
<thead>
<tr>
<th></th>
<th>Have you ever make use of ratio analysis:</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>To compare one item of expenditure with another item of expenditure?</td>
<td>21%</td>
<td>23%</td>
<td>38%</td>
<td>18%</td>
<td>44%</td>
<td>1</td>
</tr>
<tr>
<td>6.3</td>
<td>To compare the accounting statistics of one unit with those of another unit?</td>
<td>15%</td>
<td>21%</td>
<td>44%</td>
<td>20%</td>
<td>36%</td>
<td>2</td>
</tr>
<tr>
<td>6.4</td>
<td>Ratio analysis is useful for my daily operations?</td>
<td>13%</td>
<td>18%</td>
<td>51%</td>
<td>18%</td>
<td>31%</td>
<td>3</td>
</tr>
<tr>
<td>6.2</td>
<td>To compare one item of income with another item of income?</td>
<td>11%</td>
<td>17%</td>
<td>49%</td>
<td>23%</td>
<td>28%</td>
<td>4</td>
</tr>
</tbody>
</table>

**Average**

<table>
<thead>
<tr>
<th></th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>20%</td>
<td>45%</td>
<td>20%</td>
<td>35%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.22 shows the percentage of "Usually" & "Sometimes" for Question 6 by type of institutions/schools:
Table 4.22 Analysis of the Question 6 results by type of institutions/schools

<table>
<thead>
<tr>
<th></th>
<th>Have you ever make use of ratio analysis:</th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>To compare one item of expenditure with another item of expenditure?</td>
<td>44%</td>
<td>100%</td>
<td>35%</td>
<td>41%</td>
<td>51%</td>
</tr>
<tr>
<td>6.3</td>
<td>To compare the accounting statistics of one unit with those of another unit?</td>
<td>26%</td>
<td>100%</td>
<td>29%</td>
<td>33%</td>
<td>38%</td>
</tr>
<tr>
<td>6.4</td>
<td>Ratio analysis is useful for my daily operations.</td>
<td>31%</td>
<td>75%</td>
<td>23%</td>
<td>26%</td>
<td>50%</td>
</tr>
<tr>
<td>6.2</td>
<td>To compare one item of income with another item of income?</td>
<td>28%</td>
<td>75%</td>
<td>23%</td>
<td>23%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>35%</td>
<td>88%</td>
<td>28%</td>
<td>30%</td>
<td>40%</td>
</tr>
</tbody>
</table>

The survey shows that 31% of respondents claim that ratio analysis is usually or sometimes useful for their daily operations. Tertiary institutions have the highest usage (75%). This may be due to their structural complexity and a higher proficiency of management accounting techniques for their administrative staff. The low usage of such techniques in secondary schools (18%) and primary schools (51%) indicates the requirement for interpretative skills training for administrative staff in these institutions.

To Compare Expenditure Items

44% of respondents usually or sometimes make use of ratio analysis for comparing expenditure items. Among them, tertiary institutions have 100%, primary and secondary schools have less than 40% and other institutions 18%. The low usage for other institutions may be due to the reason that most of them are privately -owned, less complicated and have no rigid analysis requirements. The structure of tertiary institutions is complicated and requires formal analysis and reporting. The government funds the expenditure for secondary and primary schools and there is no urgent need for expenditure analysis.

All respondents from tertiary institutions (100%) and 51% of respondents from other institutions usually or sometimes use ratio analysis to compare one item of expenditure with another item, but only 35% of respondents from secondary
schools and 41% of respondents from primary schools do so. This may be due to tertiary institutions and other institutions being more accountable for their expenditure than the government funded secondary and primary schools.

To compare accounting statistics

Only 36% of the respondents usually or sometimes compare the accounting statistics of one unit with another unit. Most of them (66%) rarely or never use it. All respondents from tertiary institutions (100%) usually or sometimes use ratio analysis to compare accounting statistics of one unit with those of another unit, but only 38% of respondents from other institutions, 29% from secondary schools and 33% from primary schools do so. This may be due to the structure of tertiary institutions being more complicated and requiring formal analysis and reporting, while the government funds most of the expenditure for secondary and primary schools.

To Compare Income Items

28% of respondents usually or sometimes make use of ratio analysis for comparing income items. Most of them (49%) rarely use it and 23% never use it. Some of the respondents think that their institutions are non-profit organisations, therefore income comparison is not important. This is reflected in one principal's remarks:

"Our school is a non-profit organisation"

Most of the respondents from tertiary institutions (75%) usually or sometimes use ratio analysis to compare one item of income to another item of income, but only 25% of respondents from other institutions and 23% from secondary and primary schools do so.

Useful for Daily Operations

Only 31% of respondents think that ratio analysis is usually or sometimes useful for their daily operation, however most them (58%) rarely use it and 18% of
them never use it. Most of them appear not to know how to use it, as reflected by their remarks:

"Not familiar with these terms"

"What is this?"

"Unable to answer Q6"

This indicates that training in this area is required. Most of the respondents from tertiary institutions (75%) and 50% of respondents from other institutions usually or sometimes think that ratio analysis useful for their daily work, but only 23% of respondents from secondary and 26% from primary schools do so.

Group 7 Questions - What is the extent of using other management accounting techniques?

Group 7 questions aim to find out the extent to which respondents are using other management accounting techniques to make decisions. These are advanced techniques used in other countries. The survey shows that some of the respondents are not familiar with these techniques. This is reflected in their remarks:

"We do not understand these techniques."

"Not applicable to our school."

"Q 7 is too technical."

"Q 7.4 & Q 7.5 are not clear. What does this mean?"

"The above techniques are only used in profit organisation."

This shows the need for training for school administrators in order to be proficient in using these techniques. On the other hand, some respondents have difficulty in using the technique due to their own requirements, which are reflected in their remarks:

"I'm afraid your questionnaires are not too relevant to us, a small firm."

"Because our school did not make use of the mentioned accounting methods in our administration."
Table 4.23 shows the responses of the respondents, which are ranked, in the last column based on the highest percentage of "usually & sometimes":

**Table 4.23 Group 7 Questions-Other Management Accounting Technique**

<table>
<thead>
<tr>
<th>7.</th>
<th>Have you ever made use of the following management accounting techniques to assist you in making decisions?</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>N.A.</th>
<th>Combining Usually &amp; Sometimes</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8</td>
<td>Using performance indicators to evaluate performance.</td>
<td>34%</td>
<td>25%</td>
<td>25%</td>
<td>15%</td>
<td>59%</td>
<td>1</td>
</tr>
<tr>
<td>7.4</td>
<td>Apportioning cost to reallocate the budget cost of each support centre.</td>
<td>18%</td>
<td>25%</td>
<td>38%</td>
<td>18%</td>
<td>43%</td>
<td>2</td>
</tr>
<tr>
<td>7.7</td>
<td>Using direct cost, variable cost, fixed cost and overheads allocation to monitor cost.</td>
<td>11%</td>
<td>30%</td>
<td>41%</td>
<td>18%</td>
<td>41%</td>
<td>3</td>
</tr>
<tr>
<td>7.2</td>
<td>Using break-even analysis to decide whether to start a class or a programme.</td>
<td>17%</td>
<td>15%</td>
<td>49%</td>
<td>18%</td>
<td>32%</td>
<td>4</td>
</tr>
<tr>
<td>7.6</td>
<td>Using Activity Based Costing (ABC) to monitor the resources of your institute/school.</td>
<td>14%</td>
<td>18%</td>
<td>48%</td>
<td>20%</td>
<td>32%</td>
<td>4</td>
</tr>
<tr>
<td>7.1</td>
<td>Using marginal costing to decide whether to start a class or a programme.</td>
<td>10%</td>
<td>20%</td>
<td>55%</td>
<td>15%</td>
<td>30%</td>
<td>5</td>
</tr>
<tr>
<td>7.3</td>
<td>Calculate the returns to capital before you decide to rent or buy new premises for your institute/school.</td>
<td>10%</td>
<td>13%</td>
<td>54%</td>
<td>24%</td>
<td>23%</td>
<td>6</td>
</tr>
<tr>
<td>7.5</td>
<td>Using discounted cash flow (DCF) technique to evaluate long term projects.</td>
<td>6%</td>
<td>14%</td>
<td>55%</td>
<td>25%</td>
<td>20%</td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>16%</td>
<td>18%</td>
<td>46%</td>
<td>19%</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.23 shows the percentage of "Usually" & "Sometimes" for Question 7 by types of institutions/schools:

**Table 4.23. Analysis of the Question 7 results by types of institutions/schools**

<table>
<thead>
<tr>
<th>7.</th>
<th>Have you ever made use of the following Management Accounting techniques to assist you in making decisions?</th>
<th>Overall</th>
<th>Tertiary</th>
<th>Secondary</th>
<th>Primary</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8</td>
<td>Using performance indicators to evaluate performance.</td>
<td>59%</td>
<td>100%</td>
<td>48%</td>
<td>49%</td>
<td>56%</td>
</tr>
<tr>
<td>7.4</td>
<td>Apportioning cost to reallocate the budget cost of each support centre.</td>
<td>43%</td>
<td>75%</td>
<td>39%</td>
<td>33%</td>
<td>66%</td>
</tr>
<tr>
<td>7.7</td>
<td>Using direct cost, variable cost, fixed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost and overheads allocation to monitor cost.</td>
<td>41%</td>
<td>75%</td>
<td>32%</td>
<td>33%</td>
<td>67%</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>7.6 Using Activity Based Costing (ABC) to monitor the resources of your institutes/school.</td>
<td>32%</td>
<td>100%</td>
<td>19%</td>
<td>37%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>7.2 Using break-even analysis to decide whether to start a class or a programme.</td>
<td>32%</td>
<td>50%</td>
<td>19%</td>
<td>30%</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>7.1 Using marginal costing to decide whether to start a class or a programme.</td>
<td>30%</td>
<td>25%</td>
<td>19%</td>
<td>34%</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>7.3 Calculate the returns to capital before you decide to rent or buy new premises for your institute/school.</td>
<td>23%</td>
<td>0%</td>
<td>22%</td>
<td>11%</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>7.5 Using discounted cash flow (DCF) technique to evaluate long term project</td>
<td>20%</td>
<td>75%</td>
<td>13%</td>
<td>19%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>16%</td>
<td>60%</td>
<td>27%</td>
<td>30%</td>
<td>53%</td>
<td></td>
</tr>
</tbody>
</table>

**Performance Indicators**

Financial measurement is only one aspect of performance measurement. Other measures of service quality are sometimes used (e.g. number of students/parents, complaints received, internal audit assessment.). 59% of the respondents use performance indicators to evaluate performance, while 25% of the respondents rarely use it and 15% of them never use it. 100% of the tertiary and 56% of the other institutions usually or sometimes use performance indicators to evaluate performance. While the application for secondary and primary schools is lower (ie.48% and 49% respectively), the fairly high percentage indicates that administrators use performance measurement to supplement financial measurement.

**Apportioning Cost and ReallocationCost of Support Centre**

43% of the respondents usually or sometimes apportion cost and reallocate cost. Most of the respondents either rarely (38%) or never (18%) use it. Most of the respondents from tertiary (75%) and other institutions (66%) apportion cost and reallocate cost of support centres, but only 39% of the respondents from secondary schools and 33% from primary schools use this technique.

**Direct Cost, Variable Cost, Fixed Cost Overheads and Cost Allocation**
Cost information is like any other data. It needs to be organised into a pattern before any significance can be read into it. 41% of the respondents usually or sometimes use direct cost, variable cost, and fixed cost and overheads allocation to monitor cost. Many of the respondents (41%) rarely use this technique. Most of the respondents from tertiary (75%) and other institutions (67%) use direct cost, variable cost, fixed cost and cost allocation to monitor cost. Only about 30% of the respondents from secondary and primary schools use it.

*Activity-based Costing*

Traditional cost allocations has distorted the real costs of production. In Activity-based Costing (ABC), the allocation of a department's overhead costs to products is made on the basis of the cause/effect relationship between the product and the activity levels it causes in the department. Only 43% of the respondents usually or sometimes use Activity-based costing to monitor the resources of their institutions, 38% of the respondents rarely use it and 20% of them never use it. 100% of the respondents from tertiary institutions use activity based costing to monitor the resources of their institutions/schools. The usage for secondary schools (19%), primary schools (17%) and other institutions (22%) is low.

*Breakeven Analysis*

Breakeven analysis or cost-volume-profit (CRV) analysis is not limited to profitable firms, as it also pertains to non-profit organisations. Only 32% of the respondents use breakeven analysis to decide whether to start a class or a programme. This is also reflected in one principal's remarks:

"Breakeven analysis is useful for enrichment course and trips."

Only 50% of respondents from tertiary institutions and 78% of the respondents from other institutions use break-even analysis to decide whether to start a class or a programme. The usage for the respondents from secondary and primary schools is low, i.e. 13% and 34% respectively.
Marginal Costing

Marginal cost is a significant costing factor and closely relates to the concept of threshold level of expenditure and to marginal revenue. In our study, only 30% of respondents usually or sometimes use the technique to decide whether to start a class or a programme, while 55% of them rarely use it and 15% of them never use it. Only 44% of the other institutions respondents usually or sometimes use marginal costing to decide whether to start a class or a programme, while the usage for respondents from the tertiary institutions (25%), primary schools (34%) and secondary schools (19%) is lower.

Return of Capital for Decisions to Rent or Buy New Premise

Only 23% of respondents usually or sometimes make use of return of capital for decisions to rent or buy new premises, while 54% of them rarely make use of it and 20% of them never do so. It seems that this technique is not commonly used. 55% of the other institutions respondents usually or sometimes calculate the returns to capital before deciding to rent or buy new premises The usage of this technique for secondary (29%) and primary schools (11%) is low. No respondent from tertiary institutions uses this technique.

Discounted Cash Flow

Discounted cash flow (DCF) techniques are the methods of selecting and ranking investment proposals such as the net present value (NPV) and internal rate of return (IRR) methods where time value of money is taken into account. Only 20% of respondents usually or sometimes use discounted cash flow techniques to evaluate long term projects, while 55% of the respondents rarely use it and 25% of them never use it. 75% of the tertiary institutions’ respondents usually or sometimes use discounted cash flow (DCF) technique to evaluate long term projects. The usage of this technique for other institutions (11%), secondary schools (13%) and primary schools (19%) is low.
Question 8 Overall

Table 4.24 gives the overall attitude of the respondents towards the usefulness of management accounting to their work.

<table>
<thead>
<tr>
<th>Overall attitude towards Management Accounting</th>
<th>% of “Yes”</th>
<th>% of “No”</th>
<th>% of “N.A”</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Management accounting techniques are useful for my work.</td>
<td>75%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>8.2 I would like to have training in management accounting techniques.</td>
<td>58%</td>
<td>32%</td>
<td>10%</td>
</tr>
</tbody>
</table>

The statistics show that 75% of survey respondents think that management accounting techniques are useful to their work, and 58% of respondents would like to have training in management accounting. This positive response indicates that most senior managers or principals view that management accounting is a valuable tool for them to manage current operations, budget and develop future plans.

Conclusion

In this research, two vital questions arise: One question concerns the present situation in Singapore schools/educational institutions with respect to the adoption of the management accounting model and to what extent management accounting is presently being implemented. Another question concerns the value of the supposed benefits for schools/educational institutions and those who work in them arising from the adoption of such a system in full. Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified.

Among the seven groups of techniques listed in the questionnaires, there are five groups of techniques which elicited responses from more than 50% of principals/administrators response ofs “Usually” or “Sometimes”. They are Budgeting (88%), Unit cost (63%), Variance analysis (63%), Accounting information (58%) and Profit/cost centre (54%). This indicates that budgeting is the most popular tool, while unit cost and variance analysis are also popular.
Accounting information and Profit/ cost centre are also commonly used. On the other hand, Ratio analysis (35%) and Other management accounting techniques (34%), were below 50%. It seems that ratio analysis and Other management accounting techniques are not so commonly used.

Budgeting is the most popular technique, as 81% of respondents prepare budgets annually or periodically. This indicates that budgeting is an important management tool for the principals/administrators in Singapore educational institutions, particularly in tertiary institutions, government and government-aided schools. Most of the respondents think that budgeting is useful to control expenditure (97%), for planning operations/programme (96%), coordinating the activities of all departments (96%) and linking organisational objectives to strategic planning (94%). Most of the respondents think that budgeting can motivate staff members (73%). Budgeting may also create unhappiness (56%) among staff members. Most of them also think that budgeting is a useful means of asking for additional fund from the authority (91%).

Unit cost is the second most popular technique; more than 70% of respondents think that unit cost is helpful to control spending and to determine when to start or to drop a class or programme. More than 60% of them think that unit cost is useful in setting targets and monitoring, evaluating alternative delivery methods, pricing a course and measuring the profitability and efficiency of a course. However, the application of unit cost to monitor sales promotion effort is low. This is because most secondary and primary schools are not for profit organisations.

Variance analysis is the third popular technique. It is an interpretative skill. Most of the respondents are required to explain the variance. More than 65% of respondents think that variance analysis is useful in highlighting problems and in controlling over-spending. Less than 45% of respondents consider variance analysis helpful in monitoring sales promotion efforts.
Accounting information is the fourth most popular technique. More than 50% of the respondents think that it is useful for expenditure control, cash flow planning and performance evaluation.

Decentralisation and setting up profit/cost centres are the fifth most popular technique. More than 50% of the respondents think that it is useful in allocating resources and in cost control by making managers more careful in their spending. This technique is popular in tertiary institutions (100%) and other institutions (above 55%).

Ratio analysis is a technique for interpreting information. It is not commonly used (35%) except by the tertiary institutions (88%).

Other techniques are advanced tools not commonly used in Singapore (34%). Among the other management accounting techniques, performance indicators are the most popular technique (59%), but the proportion of usage for techniques like cost allocation, cost classification, breakeven analysis, activity-based costing and marginal cost are relatively low (slightly above 30%). Thus, an ideal model should set up a costing system to overcome the present deficiency.

In terms of respondents by different type of institutions/schools, tertiary institutions (60%) and other institutions (53%) use more management accounting techniques than primary schools (30%) and secondary schools (27%). In short, the study shows that most of the respondents have a positive view of management accounting techniques. This positive response indicates that most of senior managers or principals view management accounting as a valuable tool for them to manage current operations, budget and develop future plans. Most of them would like to have training in management accounting techniques. The study also shows that the usage of management accounting techniques is extensive in Singapore educational institutions. However, Singapore educational institutions still have not adopted the management accounting system in full. To obtain the full benefits of the management accounting model, a more coherent model would have to be developed. This model would consist of setting up a costing system to overcome the
present low usage of costing application in cost allocation, cost classification, breakeven analysis, activity-based costing and marginal cost (as shown in Table 4.23). The relative low application of standard costing in schools (as shown in Table 4.17) also indicates that it is timely to set up a standard costing system to serve as a benchmark for budgeting, planning and evaluating performance. Only a fairly low percentage (49%, Table 4.23) of senior managers or principal use performance indicators, showing that there is a requirement for a quick performance measurement to supplement financial measurement. A balanced scorecard system mentioned in the literature review can be adopted for this purpose. More than half of the respondents required accounting information (Table 4.13) for decision making and control. Thus, setting up a computerized database will facilitate financial analysis.

The survey indicated that budgeting is the most popular management accounting technique (88%, Table 4.14) for school senior managers or principals. The introduction of a budget and techniques handbook can serve as a useful guideline to them. The findings of the questionnaires show that most questionnaire respondents have a positive view of management accounting techniques and agreed that it was useful for their work (75%). Most of them would like to have some training in management accounting techniques (58%). A workable model, would provide these managers or principals with management accounting training, or else the appointment of a bursar as the management accounting administrator to administer the model would be necessary.

In this research, survey data collection will be conducted by postal questionnaires from a large sample. In addition, interviews will also be conducted with principals and senior managers. The purpose of the interview is to enable a more in-depth understanding of the data. The data from interviews is reported in Chapter 5.
Chapter 5

Presentation of Interview Findings
Chapter 5

Presentation of Interview Findings

Interview

As mentioned in Chapter 3, interviews were conducted with principals. The purpose of the interview was to enable a more in-depth probing on the application of management accounting techniques in schools. This chapter will give a summary of the data collected from the interviews so that this data may be used to more fully explore the research problem and questions.

The questionnaire sample showed that secondary schools, primary schools and tertiary institutions had the highest response rates, but very few administrators were willing to participate in the interview. Out of the three respondents who indicated their availability for an interview, none of them was available for the subsequent interview. As a result, six interviews were conducted randomly with the principals from other schools: one from a government primary school, three from government secondary schools, one from a private secondary school and one from a private commercial school. Although the interview did not cover all types of institutions as planned, it covered the most important type of Singapore institutions, namely, the secondary and primary schools, the government and private schools and the private commercial schools which form about 70% of Singapore institutions. This data could give more insight into the attitude of our principals towards management accounting techniques and the extent and type of techniques used by them.

Summary of the interviews

The summary of the interviews with six principals (Appendix 4.1) is addressed in the next section. We will examine this data in detail in order to explore the research problem and questions.

Interview 1 (with Principal A)

Interviewee: Principal A (Male) of a Government Secondary School (1000 to 3000 students).
Principal A described the financial operation of a government school as mainly handled by the Ministry of Education; nevertheless, the principal could monitor those funds raised by the school.

Principal A explained:

"In Government Schools, the operating expenditure like teacher salaries, electricity bills, maintenance expenditure is handled by the Ministry of Education. The miscellaneous fees collected from the students are up to the principal to use for school activities. We can also raise funds through fun fairs and concerts to support the school programmes."

He felt that management accounting techniques were helpful for him to monitor those resources under his control and provided him more decision-making information. He thought that this information was useful to evaluate the performance of a division, such as to compare stationery supplies expenses among the divisions. He prepared the budget every year, finding that budgeting was useful for his daily operations, especially for controlling expenditure and allocating resources. He was not familiar with standard costing, but he thought that variance analysis and setting up cost centres was useful to control cost. He was familiar with other management accounting techniques like marginal costing and break-even analysis. He always used unit cost to measure the financial performance of the course and ratio analysis for comparison of income and expenditure.

Principal A advocated that management accounting was useful for his work and he would like to have training in management accounting techniques.

Interview 2 (with Principal B)

Interviewee: Principal B (Male) of a Government Primary School (1000 to 3000 students).

Principal B shared the same view with Principal A that school principals were given more autonomy to manage their school fund. He stressed that Government schools still could use their own funds to support their new programmes:
"The miscellaneous fees collected from the students are up to the principal to use for the school activities, to support a new programme. We can also raise funds through fun fairs, concerts. Now students have Edusave Fund, special courses can be paid by Edusave”.

Principal B was also supportive of management accounting. B claimed that he did not know much about management accounting techniques. Since the school was funded by Government, he seldom made use of accounting information for profitability evaluation. Unlike A who prepared the annual budget by himself, he prepared it with the help of staff. He found that budgeting was useful for planning, daily control of expenditure and as a means of asking for additional funds. He was not familiar with unit cost, ratio analysis, variance analysis and other management accounting techniques. However, B was supportive of management accounting techniques and was willing to have training in this area.

Interview 3 (with Principal C)

Interviewee: Principal C (Male) of a Government Secondary School (1000 to 3000 students).

Similar to A and B, Principal C claimed that in government schools, there were funds like miscellaneous fees which the school principal was empowered to use for school activities. He felt that management accounting was useful for his work especially in sharing limited resources among many departments and programmes. He only sometimes made use of accounting information for decision making. He found that budgeting was useful for planning, controlling expenditure and a useful means for asking for more funds. He found standard costing and variance analysis useful. Among the other management accounting techniques, C found performance indicators useful. Principal C appeared keen on using management accounting for his work; he also indicated his desire to have training on these techniques.

Interview 4 (with Principal D)

Interviewee: Principal D (Female) of a Government Secondary School (1000 to 3000 students)
Principle D claimed that in government schools, there were funds like miscellaneous fees which school principals were empowered to use for school activities. She was not supportive of management accounting, explaining:

"I think management accounting is not useful for my work. Principals should pay more attention to the professional matters, while the accounting matters should be left to the school administrator to take care of."

She also added:

"I don't think training for management accounting is useful, I am busy."

It seemed that D was different from the previous three principals, she had an unfavorable opinion of management accounting because this was not a professional matter for teachers. In spite of her unfavorable remarks, she used accounting information to control expenditure. She would not like to have training in management accounting techniques.

**Interview 5 (with Principal E)**

**Interviewee: Principal E (Male) of a Private Secondary School (1000 to 3000 students).**

Principal E claimed that the operation of a private secondary school is different from a government school, because he needed to raise sufficient funds for his private school operation without much government assistance. As there was very little grant given to his school, principal E tried hard to generate revenue to meet ever-increasing operating expenditure.

He commented,

"Management accounting is very useful. Sure, we should have more training on management accounting", "it is very useful to monitor the income as well as the expenditure."

E also added,
"Our school is a private school, we have to make ends meet. How to increase income is important. This is challenging. It is like a business".

Besides using accounting information for financial performance and profitability evaluation, he found this information useful for capital expenditure decisions and cash flow planning. He also found budgeting useful for planning and asking for additional funds. He agreed that budgeting could motivate staff and could create unhappiness among staff members. Principal E was very supportive of the management accounting model.

Interview 6 (with Principal F)

Interviewee: Administrator F (Male) of a Private commercial School (below 1000 students).

Administrator F explained that as the school was small, he required accounting information to make daily decisions, such as cash flow planning and monitoring of expenditure. The school was small, there was no sub-unit, therefore it was not necessary to evaluate the performance of a sub-unit, except prepare the profit and loss account. He was very supportive of management accounting.

After giving a summary of the briefings of the interviews with six principals, let us now look at this data in detail in order to explore the research problem and questions.

1. What is the extent of using Accounting Information to make decisions?

A commented (interview 1),

"Accounting information is useful, to control expenditure. I need to know the actual expenditure and timing of the payment to plan cash flow. It is very helpful for decisions for capital expenditure like buying a photocopier machine, office equipment where the amount is large. This is vital for all organisation."
The above remarks given by Principal A showed that accounting information was useful to him to control expenditure and cash flow planning. As profit making was not the objective of a Government school, he seldom made use of accounting information to evaluate the profitability of his schools as he gave the following remarks:

"We are a Government school, profit is not important"

He used accounting information to determine whether to start a new class or a new programme, but he thought that sometimes this information was useful to evaluate the performance of a division, such as to compare stationery supplies expense among the divisions.

Similar to A, Principal B (interview 2) usually used accounting information to control expenditure, especially capital expenditure such as the purchase of a computer, cash flow planning, and decisions as to whether to start a new class or a new programme.

This was reflected in his remarks:

"Yes, accounting information is useful,"

Since the school was mainly funded by Government, he also seldom made use of accounting information for profitability evaluation or performance evaluation of a division except sometimes using this information to evaluate the performance of his school in term of expenditure saving.

In the case of C, C affirmed (interview 3),

"I use accounting information to control expenditure, to plan cash flow, to make decision on capital expenditure."

This showed that Principal C shared the same view as Principals A & B. Similar to B, C only sometimes used the information to evaluate the financial performance of his school and to evaluate the performance of a division. He seldom used it to evaluate the profitability of his school and decide whether to start a new class or a new programme because his school was a government school.

D gave her view (interview 4),
"Yes, accounting information is useful to control expenditure, to know that you are not over-spending."

In spite of her previous unfavourable remarks on management accounting, she usually used accounting information to control expenditure. She sometimes used it to evaluate the financial performance of her school, to determine whether to start a new class or a new programme, to spend on capital expenditure and to plan cash flow. Similar to the previous principals, she seldom made use of accounting information for profitability and performance evaluation.

As for E (interview 5), beside using accounting information for financial performance and profitability evaluation, to control expenditure, decide on capital expenditure and cash flow planning, he sometimes used it to evaluate the performance of a division and to make decision as to whether to start a new class or a new programme. He was very supportive of management accounting.

For F (interview 6), he agreed,
"Yes, accounting information is important to plan cash flow, to know when to pay the bill."

He always made use of the information to determine whether to start a new class or a new programme.
"We are a private commercial school, run as a private business. Of course, we want to have profit," F explained.

Generally, accounting information is useful to all principals for expenditure control, decision-making and sometimes for performance evaluation. Thus, in the workable model for Singapore, an on-line data bank would be set up to provide relevant information to school administrators for decision making.

2. What is the extent of using a budgetary system?

Principal A (interview 1) claimed that budgeting was a useful means of asking for additional funds from the Ministry of Education which was reflected in his remarks:
“Spend all, otherwise, you can’t ask for more next year.”

He had to prepare the budget every year, finding that budgeting was useful for his daily operations, especially for controlling expenditure and allocating resources. He agreed that budgeting was useful for planning operations and for linking school objectives to strategic planning, and to force him to think in advance of the activities of all departments. He found that budgeting could motivate staff when they knew that budget provision was available for their programme and activities. However, he felt that budgeting could also create unhappiness among staff when their programmes were turned down due to fund constraints.

Unlike Principal A, Principal B (interview 2) did not prepare the annual budget by himself, but with the help of his staff.

B explained,

“The Deputy principal prepares the budget for me. She has consulted the departmental heads. But I give the final approval.”

Similar to principal A, principal B found that budgeting was useful for his daily operations and planning operations, for controlling expenditure and allocating resources. He also felt that budgeting could motivate staff, when there was a greater allocation of fund for his staff’s project or programme, and created unhappiness among staff when limited funds are available.

B gave his view,

“Sure, budgeting is useful for linking school objectives to strategic planning and for coordination of activities of all departments, as all heads of departments are involved.”

Similar to A, B found that budgeting was a useful means of asking for additional funds. He explained,

“We normally spend all, otherwise you will get less next year” he pointed out, “saving is not allowed to be carried forward to next year.”
In the case of C (interview 3), like other government school principals, C was usually involved in budget preparation. He agreed with A & B that budgeting was useful for planning operations, a useful means of asking for additional funds, controlling expenditure and allocating resources. Similarly, he felt that budgeting was useful to his work, to motivate staff and in coordination of activities and linking of organisational objectives to the strategic planning. However, he found that budgeting could create unhappiness among staff.

C gave his view:

"My staff will not be happy, if they have to scale down their budget, while another department get what they want."

As to D (interview 4), she confirmed,

"I prepare a budget every year because MOE want us to prepare one".

Similar to A, B & C, she found budgeting useful for planning operations. She regarded budgeting as a useful means of asking for additional funds, for controlling expenditure and allocating resources. She also found budgeting assisted in the coordination of departmental activities. She felt that a budgetary system was only sometimes motivated staff and linked organisational objectives to strategic planning. She felt that budgeting was useful for her daily operations. On the other hand, she pointed out that budgeting could create unhappiness among staff who required more funds to run their programmes.

As to E (interview 5), he was usually involved in budget preparation. He found budgeting useful for planning operations, asking for additional funds and for linking organisational objectives to the strategic planning. He thought that budgeting was useful for controlling expenditure and allocating resources and for assisting in the coordination of activities of all departments. Generally he found budgeting useful for his daily
In the case of F (interview 6), he did not prepare a budget for the whole school. He only prepared budget for programmes and courses and agreed that budgeting was useful for his daily work. F asked,

"Annual Budgeting? We do not prepare an annual budget. We are small, it is no use. The most important question is to know whether you have enough students to open a class. We only prepare a budget for a class, to know how many students to accept before we make a loss."

For sales budget, F stated that when the actual performance was better than budget, it was encouraging and motivating for staff, but budgeting also created unhappiness among staff when the actual performance was below budget. He did not use budgeting for linking to school objectives and strategic planning; he thought that that this was not very useful for a small private commercial school.

Generally, five out of six interviewees prepare budgets. They think that budgeting is an important management tool for strategic planning, allocating resources, controlling expenditure, asking for more funds, and motivating staff members. Since budgetary system is such an important management accounting tool, in the workable model a budget and management accounting techniques handbook would be provided to school principals and senior managers as a guideline and reference resource book.

3. What is the extent of using variance analysis and standard costing?

Principal A (interview 1) was required to explain the variance to higher authority. This was indicated from his remarks,

"If you spend more, they want an explanation."

He thought that variance analysis was useful to control over-spending and highlight problems, but not relevant to sales promotion. Generally, he felt that variance analysis was only sometimes useful for his work.
He was not familiar with standard costing; this was reflected in his remarks:

"Standard costing, never heard of."

Similar to A, Principal B (interview 2) was usually involved in variance explanation. This was reflected in his remarks:

"If expenditure is more than budget, MOE requires an explanation".

He found variance analysis helpful for controlling over-spending, highlighting problems and for follow-up action. As a government school is not a profit-making institution, he thought that variance analysis was rarely used to monitor sales promotion.

As to standard costing, he seldom made use of standard costing to monitor performance. This was reflected in B’s remarks:

"Standard costing? No."

As to C (interview 3), he gave his view:

“I use standard costing, this is some form of standard cost which is useful for budgeting and controlling cost” he asserted, “If there is over-spending, I have to give an explanation”.

C found that standard costing and variance analysis is useful.

He also affirmed: “We are not for profit. “

Hence, he rarely used variance analysis for monitoring performance and sales promotion. Generally, he felt that variance analysis was useful in highlighting problems.

As to D (interview 4), unlike the previous three principals, she was only sometimes involved in explaining the variance and only sometimes found it useful to control over-spending, highlight problems, monitor sales promotion and use standard costing to monitor performance. This could be due to her unfamiliarity with the techniques. In the case of E, he usually involved in explaining the variance. He found variance analysis useful in controlling over-spending and in monitoring sales promotion.
He regarded standard costing useful for monitoring performance. He found variance analysis only sometimes useful in highlighting problems.

As to F (interview 6), he seldom made use of variance analysis. He felt that this was not very useful for his daily work.

In summary, only three out of six interviewees found variance analysis useful, possibly due to unfamiliarity with the techniques. They used this technique to control expenditure. As to standard costing, only three out of six interviewees used it for operation. This indicated that in order to enjoy the benefits of a full management accounting model, a standard costing system should be set up to serve as a benchmark for budgeting, planning and evaluating performance.

4. What is the extent of using decentralisation and setting up profit/cost centres?

A (interview 1) indicated that decentralisation and setting up cost centres was useful in controlling costs in the following remarks:

"Setting up cost centres is useful, I will know which departments spend more. They also know not to over-spend."

He claimed that cost centres assisted him in allocating resources and made his departmental heads careful in spending. But he felt that a profit centre was not relevant. This point was reflected in his remarks,

"Profit centre is not relevant to Government schools."

B (interview 2) also usually found decentralisation and setting up a cost centre useful in controlling costs, allocating resources and made his departmental heads more careful in spending. As to profit centres, he shared the view of Principal A that profit centres did not give his departmental heads more responsibility and innovation. He did not accept the assertion that profit centres were useful for accounting for revenue.

For C (interview 3), principal C asserted:

"..."
"Setting up cost centre so that you know who spends more, and who is over-spending."

He thought that cost centres were useful in cost control, made his departmental heads careful in spending and assisted in allocating resources. For the same rationale as A and B, C did not think that profit centres gave his departmental heads more responsibility and innovation. He pointed out that profit centres were not useful for accounting for revenue.

For D (interview 4), she only sometimes found decentralisation and setting up cost centres useful in controlling cost and allocating resources. She thought that profit centres sometimes gave her departmental heads more responsibility and innovation, and cost centres made her departmental heads more careful in their spending.

For E (interview 5), he gave his view:

"Setting up cost centres is useful in controlling costs", he confirmed," they will be careful in spending".

Unlike the previous principals, he felt that profit centres gave his departmental heads more responsibility and innovation.

F (interview 6) confirmed,

"The school is too small to have many cost centres like other companies, but we have set up profit centres for different types of courses, such as LCCI bookkeeping courses, IT courses and setting up cost centres to trace the costs. Cost centres are a useful measure to control costs and find out the profitability of the course"

Generally, most of the interviewees felt that cost centres were useful for cost control and allocation of resources. Only a few interviewees thought that profit centres gave departmental heads more responsibility and innovation. This indicated that in order to enjoy the benefit of a full management accounting model, a proper costing system should be set up to structured to the requirements of the institutions in order to provide relevant costing information.
5. What is the extent of using unit cost and unit income?

Principal A (interview 1) pointed out that unit cost was useful in measuring the financial performance of the course, especially for pricing and making decisions on whether to run, to expand or to drop a course and decision on delivery methods for a course. For example, larger versus small class size, holding course in school versus holding course outside the school. He also found that unit cost was helpful in controlling spending, measuring profitability of a course and monitoring the sales promotion effort. He added that it was also useful for setting targets and monitoring performance for his school.

As to B (interview 2), unlike A, principal B claimed:

"I don't know much about unit cost."

Therefore he seldom used unit cost to control spending, measure profitability, monitor sale efforts, set targets and monitor performance.

For C (interview 3), he commented:

"Unit cost is useful for pricing courses, for deciding whether to run a course and determining the delivery method."

C agreed with Principal A that unit cost was helpful in controlling spending, measuring profitability and monitoring sales efforts. He found that unit cost was only sometimes useful in setting targets in monitoring performance.

For D (interview 4), she sometimes made used of unit cost to measure financial performance of the course. However, she rarely found unit cost useful for pricing courses, deciding to run a course, deciding on the delivery method of a course, controlling spending, measuring profitability, monitoring sale efforts, setting targets and monitoring performance.

For E (interview 5), he usually made use of unit cost to control over-spending, and to measure profitability of a course. He thought that unit income was useful for monitoring sales promotion efforts and for setting targets for monitoring performance.
F (interview 6) sometimes made use of unit cost to measure the financial performance of the course. He found unit cost useful for pricing courses, deciding to run a course, and decision on the delivery method of a course. He also found unit cost helpful in controlling spending, measuring profitability, setting targets and monitoring performance. He rarely used unit cost to monitor sales promotion efforts.

Generally, the majority (five out of six) of the interviewees felt that unit cost was a useful tool for decision-making, cost control and monitoring performance. Not every interviewee was familiar with this technique, therefore training is required for these principals. This indicated that in order to enjoy the benefit of a full management accounting model, suitable training on management accounting techniques should be provided to senior managers or principals. Furthermore a bursar might be appointed as the management accounting administrator.

6. What is the extent of using ratio analysis?

A (interview 1) always used ratio analysis for comparison of income, expenditure and for comparison of the performance of one unit with another unit. He felt that ratio analysis was useful for his work.

Principal B (interview 2) was not familiar with this technique. He seldom made use of ratio analysis for comparing income and expenditure and for performance comparison of a unit.

Similar to B, C (interview 3) only sometimes used ratio analysis for comparison of income, expenditure, and the performance of one unit with another.

D (interview 4) seldom made use of ratio analysis for comparison of income, expenditure, or the performance of one unit with another unit. E (interview 5), usually used ratio analysis for comparison of income and expenditure, but only sometimes used ratio analysis for comparison of the performance of one unit with another.

F (interview 6) only made use of ratio analysis for comparison of the expenditure of one unit with another unit.
Generally, only three out of six interviewees felt that ratio analysis was useful for revenue and expenditure comparison. This indicated that in order to enjoy the benefit of a full management accounting model, suitable training on management accounting should be provided to senior managers or principals.

7. What is the extent of using other management accounting techniques?

Principal A (interview 1) claimed that he was familiar with other management accounting techniques, giving the following explanation:

"Marginal costing, break-even analysis, return of capital, overhead allocation, activity based costing, direct cost, variable cost and performance indicators are useful," he explained, "as to discounted cash flow method, we do not use very often, only for long term projects required for submission to MOE".

Unlike A, B (interview 2) seldom found marginal costing, break-even analysis, return of capital, overhead allocation, activity based costing, direct cost, variable cost and discounted cash flow useful for his work. However, he found performance indicators were useful in evaluating the performance of a school or a division.

C (interview 3) only sometimes found that overhead allocation, discounted cash flow, activity based costing, direct cost, variable cost useful for his work. He usually found that performance indicators were useful. However, like Principal B, he rarely made use of marginal costing, break-even analysis, return of capital or discounted cash flow. He stated that he did not know much about other management accounting techniques.

D (interview 4) asserted that breakeven analysis and performance indicators were useful for her work:

"We use breakeven analysis for the enrichment programmes and trips, to find out at least how many students should participate so that the fees collected can cover the cost," she asserted, "I don't think that marginal costing, activity based costing or direct cost are useful. Performance indicators may be useful."
E (interview 5) usually found overheads allocation, direct cost, variable cost and performance indicators useful for his work. He sometimes found that marginal costing, break-even analysis, return of capital and activity based accounting useful, but he used discounted cash flow for his building projects, e.g. a new school building and premises.

F (interview 6) always made use of marginal cost and breakeven analysis for his costing and for decisions as to whether to start a class or a programme. He always made use of performance indicators to evaluate performance. As the principal of a small private school, he explained that he had no opportunity to make use of techniques such as ABC, DCF, or overheads allocation.

In summary, four out of six interviewees felt that other management accounting techniques, such as marginal costing and break-even analysis were useful. Activity based costing (ABC) and discounted cash flow (DCF) are still not familiar to three interviewees. This indicated that training for management accounting should be conducted.

Conclusion

Five out of six interviewees had a positive view of management accounting techniques and agreed that it was useful to their work. Out of six interviewees, only one principal viewed that management accounting was not useful and she did not want to have training in management accounting techniques. She felt that principals should pay more attention to the professional aspect of their work. Management and accounting should be left to the school administrator to take care of, so she felt that knowledge of management accounting would not be very helpful. To the contrary, the other interviewees expressed their keen desire to have the training. Among the seven groups of techniques, budgeting was the most popular technique. All interviewees were involved at least to some extent in budget preparation. They all agreed that budgeting was useful to their work, especially expenditure control and cash flow planning. Five out of six interviewees thought that budgeting was useful for allocating resources, for assisting in
the coordination of activities of all departments, and for linking organisational objectives to strategic planning.

Variance analysis and profit/cost centres were usually used by some of the interviewees. Most of them (five out of six interviewees) agreed that variance analysis was useful in highlighting problems and expenditure control. All principals from Government schools were required to explain variance when actual expenditure was more than the approved budget. Only two interviewees thought that standard costing was useful. Most of them thought that cost centres were useful for decentralisation and expenditure control. However, as most of the interviewees were from government schools, profit centre techniques were not as popular as the cost centre technique.

As to accounting information, most of them (five out of six interviewees) thought that it was useful for controlling expenditure, especially capital expenditure and cash flow planning. Most of them (three out of six interviewees) were not familiar with ratio analysis and other management accounting techniques, such as breakeven analysis, overheads allocation, discounted cash flow and marginal cost. All of them pointed out that performance indicators were useful to evaluate performance. In short, most of the interviewees (five out of six interviewees, especially the private school) have a positive view of management accounting techniques and claimed that it was useful. In addition, most of them (five out of six interviewees) expressed their keen desire to have training in management accounting techniques. This positive response indicates that most senior managers or principals view management accounting as a valuable tool for managing current operations, budgeting and developing future plans. Most of them would like to have training in management accounting techniques. The study also shows that the usage of management accounting techniques is extensive in Singapore educational institutions. However, the study also shows that Singapore educational institutions still have not adopted the management accounting system in full. In order to reap the benefit of using a full management accounting model, an ideal model of Finance in Singapore Education would be introduced. This would be discussed in further detail in the later chapters.
Chapter 6

Analysis
Chapter 6

Analysis

In the early chapters, it was argued that a management accounting model is an important management tool for using accounting data and other information to achieve organisational objectives. In Singapore, the present accounting system is still not adequate. The aim of this study is to establish the extent of application of management accounting in the educational institutions in Singapore and the attitudes of the managers of these institutions towards its effectiveness. Through this study, the researcher hopes to introduce a management accounting system which is worthwhile and contemporary, and which can assist the Singapore educational managers improve in resource management.

The extent of application and overall attitude

The survey findings presented in Chapter 4 showed that the extent of application of management accounting in Singapore educational institutions was extensive. 75% of survey respondents thought that management accounting techniques were useful for their work, and 58% of respondents would like to have training in management accounting. In the interviews, five of the six interviewees felt that management accounting techniques were useful and expressed a desire for training on this technique. This is a positive indication that institutional leaders in Singapore are keen to be equipped with management accounting techniques to face new challenges. On the other hand, it shows that although there is some resistance to introducing a new model, the principals/administrators are amenable to change.

Nonetheless, these statistics also indicated that there was still a minority (about 25% of questionnaire respondents) who did not think that management accounting techniques were useful for their work, and 42% of respondents would not like to have training in management accounting techniques. This showed that a minority of principals were still indifferent to the techniques. One interviewee (Interview 4) indicated that some principals might still have the misconception that they should not be concerned with non-professional matters. This correlates with a case study in the United Kingdom where
Knight (1993) revealed that when he first suggested school budgeting in the mid-1970s, his audiences were distinctly cool. But from the early 1980s, financial delegation has spread rapidly in Canada, USA, Australia, New Zealand, South Africa, Holland and Belgium. More schools in the UK became responsible for their own budgets.

**Management accounting techniques used by principals/administrators**

In chapter 2, the literature review showed a list of commonly used management accounting techniques applicable to educational institutions: (1) using accounting information (2) budgeting (3) variance analysis (4) decentralisation, profit centre/cost centre (5) unit cost (6) ratio analysis (7) other management accounting techniques. Among them, budgeting is the most important one as it relates to resource management and allocation (Davies, 1994), and provides a framework for strategic planning (Glover 2000). It is also a tool for monitoring efficiency (McAleese 2000).

**Budgeting**

In the literature review, many writers viewed budgeting as the most important management tool. Davies (1994) claimed that budgets were related to a large number of management processes and applicable to resource allocation. Levacic (1990) asserted that budgeting was a very important aspect of financial management and certainly the dominant one as far as schools and colleges were concerned.

In Singapore, it was shown that budgeting was also the most popular management accounting tool used in educational institutions. In particular, in government schools, most of the principals and administrators (95%) were involved in budget preparation and this was a requirement set by MOE; most of respondents (94%) thought that it was useful for their operations, especially in controlling expenditure.

This was reflected in one of the questionnaire respondent’s remarks: “Budgeting enhances financial control and knowing the urgent needs of the school,” and further substantiated by the fact that five principals interviewed prepared budgets. This also
generally confirmed Gross’s experience (Gross 1966) with the Grand Rapids diocesan elementary schools in U.S.. Gross found that the school budget was a blueprint for success. A formal budget process helped to stabilize the financial foundations of the schools.

But the preparation of budgets for administrative requirements might not indicate that the administrators understood that budgeting was a planning tool and an integrated part of the management process. This was shown in some of the respondent’s remarks:

"I prepare a budget every year. Because MOE wants us to prepare it (Interview 4)."

"It is compulsory for schools to have a Budget. No budget- no money release from MOE (Interview 1)."

For small private institutions, budgeting might not be so important; administrators might only prepare the sale or programme budget rather than the annual budget. This was reflected in one interviewee’s remarks:

"Annual Budgeting? No, we do not prepare an annual budget. We are small, it is no use. The most important thing is to know whether you have enough students to open a class. We only prepare a budget for a class, to know how many students we should accept before we make a loss (interview 6)."

This shows that training in management accounting is necessary for principals or administrators so that they understand the objectives of the budgetary process.

Control Expenditure

Mcaleese (2000) claimed that a budgetary system monitored expenditures. This study showed that most of the Singapore institution/school respondents (97%) used budgeting to control expenditure, even though the interviewees in Government schools claimed that not all budget items were under their control. Costs like staffing, utilities and major maintenance expenditure related to school buildings were centrally administered by the Ministry of Education. As to the interviewee in the private school, his budget was
also under the surveillance of the Governing Board. Only some amount of the budget was under the principal's control (interview 5). The only exception was in the small private commercial school where the interviewee (Interview 6) thought that budgeting was not necessary. These findings resembled Levacic's case studies of a primary school and two secondary schools with delegated budgets. In her review, she agreed that delegated budgeting made the staff in school more cost conscious so that they took these costs into consideration for decision making (Levacic, 1989). Likewise, Gross (1996) found that the budgeting process provided true per pupil costs of the Grand Rapids diocesan schools.

Planning, Coordinating and linking organisational objectives to Strategic Planning and Coordination of Activities

Davis (1994) claimed that many writers see budgeting as a means of relating expenditure to the achievement of objectives. The budgetary process enables the organisation to plan, co-ordinate, control and evaluate its activities. Anthony and Herzlinger (1989) stated that a budget is a plan expressed in monetary terms.

In relation to the functions of budgeting, above 90% of the respondents thought that budgeting was useful (1) for planning the operations/programme (2) for coordination of activities of all departments (3) for linking organisational objectives to strategic planning. The “other institutions” had a lesser usage (57%). Most interviewees hold similar views except for the private commercial schools (interview 6).

One interviewee confirmed:

"Sure, budgeting is useful for linking school objectives to strategic planning and for coordination of activities of all departments, as all heads of departments are involved (Interview 2)."

For coordination, he agreed,

"The Deputy principal prepares the budget for me. She has consulted the departmental heads. But I give the final approval (Interview 2)".

These findings confirmed the views of Schick (1972) and Irvine (1975). They referred to budgeting as a means of relating expenditure to the achievement of objectives.
Glover (1997) affirmed that there was a need to link between the educational objectives and the resource patterns to achieve these objectives. The formulation, implementation and evaluation of the budget made this possible. Similarly, the UK National Audit Office (1997) stressed the importance of linking strategic planning and the budgetary process.

**Asking for More Funds**

Wildavsky (1974) claimed that the budgeting process is a dynamic one with competing forces vying for funds to meet differing expenditure needs. Wildavsky (1974, p.xxiii) provided a useful perspective on this:

> "Human nature is never more evident than when people are struggling to gain a larger share of funds or to apportion what they have among myriad claimants".

Budgeting is also a bidding system, which involves set criteria to enable bidders and decision-makers to assess priorities (Bush 2000).

More than 90% of respondents felt that budgeting was a means of asking for more funds. It could be a political struggle for more funds. Most interviewees agreed that they could obtain more funds through greater skill of budget preparation. These are examples of their remarks:

> "We normally spend all, otherwise you will get less next year (Interview 2)."
> "Spend all, otherwise, you can't ask for more next year". "Savings are not allowed to be carried forward to next year (Interview 2)".

The above findings to some extent confirm the views of Wildavsky and Bush.

**Budgetary Slack**

The above findings also illustrate the weakness of budgetary slack. Arnold & Hope (1989) stressed that slacks are one of the limitations of budgeting. Budgetary slacks represent a degree of padding introduced into budgets so as to guard against possible failure to attain targets. It is deemed necessary so as to guard against possible failure to
attain targets. Some interviewees affirmed that they always provided for contingencies to cater for unexpected items. They also intended to spend their budget in full to avoid future reduction in budget allocation.

They gave these remarks:

"Spend all, otherwise, you can’t ask for more next year (Interview 1)”,

"We normally spend all, otherwise you will get less next year, savings are not allowed to be carried forward to next year (Interview 2)”.

These remarks seem to support Arnold & Hope’s view.

Under the Local Management of Schools, the self-management schools system, heads are delegated to exercise control over their budget and may move items from one item of budget to another. They are also allowed to carry forward the item to the next financial year. If this system was applied in Singapore schools, it might reduce the amount of budgetary slack.

*The human side of the budgeting process*

Arnold and Hope (1989) pointed out that all budgeting processes involved relationships between people. Thus budgeting entails behavioural problems. The budget is a device for motivation. Better performance can be expected from employees if they have some say in the construction of the budgets to be used to evaluate their performance.

*Motivating staff and creating unhappiness*

Levacic (1993) suggested that teachers might be motivated through participation in decision making by being budget-holders in their own right. Arnold & Hope (1989) pointed out that if budgets were set at too high a level, individuals might become discouraged in their tasks and not attempted to meet targets. Alternatively, if budgets were pitched at too low a level, individuals may become self-satisfied and inefficient. Ideal budgets were intended to act as a powerful incentive to performance. It was
desirable to set the budget at an attainable level. Most of the interviewees (73%) also thought that budgeting could motivate staff; this was reflected in their remarks:

"When staff know that there was budget provision for their programme and activities, they are happy because they have more fund to run their programme (Interview 4)."

"For sales budget, it was encouraging when the actual performance was better than budget (interview 6)."

Wildavsky (1968) conceived of budgets as attempts to allocate financial resources through political process. He stressed that if politics is regarded as conflict over whose preferences are to prevail in the determination of policy, then the budget records the outcomes of this struggle. Simkins (1989) viewed budgeting as a political and organisational process in educational institutions. One interviewee expressed his concern that some teachers had to curtail their activities due to limited financial resources. The competition for funds sometimes creates unhappiness among teachers. 56% of the respondents thought that budgeting created unhappiness among staff. Most interviewees agreed with this, as reflected in their remarks:

"My staff will not be happy, if they have to scale down their budget, while another department get what they want (Interview 2)."

"I have to negotiate with higher authority for resources, like staffing and facilities. (interview 2)."

Limitations of Budgeting

Hope and Frazer (1999) asserted that budgeting was well known for reinforcing the command and control culture, constraining freedom and autonomy, and stifling the very challenges that excite prospective managers. They thought that budgets are the main barriers against firms competing more effectively in the information age. Glover (1998) identified practical problems in school budgeting:
(1) The manager regarded budgeting as an administrative chore and evaluation becomes a passing exercise (2) the system was dependent upon readily accessible data, but there were problem of data processing. (3) The existence of isolationism of the departmental groups which was detrimental to cross-curricular initiatives (4) Lack of coherence which made expenditure fail to achieve value for money. Administrators should be mindful of these limitations and should not adhere inflexibly to the budgeting system.

Training for budgeting and handbook for budgeting

The study showed that budgeting was the most popular management accounting tool used in Singapore educational institutions. In order for principals or senior managers to use the budgetary system more effectively for planning, coordinating, control, and to overcome the shortcomings of the budgetary system, training should be provided to principals and managers. In addition, a budget handbook with standard budget format, terminology and illustrations would be provided to serve as guidance.

Standard costing system

Our study revealed that standard costing is still uncommon in schools. Only 57% of the respondents used it for performance monitoring except tertiary (75%) and other institutions (86%). Nevertheless, one interviewee (interview 3) supported its use and gave the following remarks:

"I use standard costing, this is some form of standard cost which is useful for budgeting and controlling cost. If there is over-spending, I have to give an explanation."

As mentioned in the literature review, standard costing system is one of the most important management accounting techniques. In order reap the benefits of adopting a full management accounting model, the researcher suggests that a standard costing system should be established.

Unit Cost
Knight (1989) argued that unit cost is the most powerful but most under-used weapon in the financial manager's armory. Fielden & Pearson (1989) claimed that unit cost is preferred as a measure of resource impact: cost per pupil, per student-hour or cost per film are useful ways of studying educational activities. They are valuable and often essential for cost comparison across years or between schools. Carr (1989) used unit cost data for pricing services and measuring the efficiency of colleges. Jones (1989) used unit costs for budgeting and accountability by means of the optimum unit cost.

In this study, unit cost is the second most popular management accounting technique. 63% of respondents in Singapore educational institutions used it. Therefore it seems that the unit cost technique is not "under-used" in Singapore institutions. Generally, the interviewees also felt that unit cost was simple to understand and easy to use. This helped them to focus on the item such as receipts per student and expenditure per student.

One interviewee (interview 3) commented:

"Unit cost is useful for pricing cost, for deciding whether to run a course and determining the delivery method".

The interviewee (interview 6) in the private commercial school felt that it was the quickest method to determine the costing of a programme or a class. Unit cost is a quick measurement for the relationship between inputs and outputs, even if it is only an intermediate measure. On the other hand, some questionnaire respondents did not make use of this technique due to their own requirements. This was reflected in their remarks such as:

"Not for diploma course"

"Q5 (unit cost) will not apply so much to Government schools,"

"Our school is a non-profit organisation".

"We are providing education to the deaf, it cannot depend on cost effectiveness."

Unit Cost Controls Over-Spending
Carr (1994) related unit costs to Activity-based Costing (ABC) by attaching a cost to an activity to raise the awareness level of users to the price and value of that activity. Jones (1989) used unit cost for budgeting and accountability by means of the optimum unit cost. Unit cost seeks to measure the cost of the output. Outputs are related to objectives or purposes in term of products or services. The control for unit cost is to ensure that the actual unit cost is lower than budgeted unit cost.

72% of the respondents thought that unit cost was helpful in controlling over-spending. Among them, tertiary institutions, secondary schools and other institutions were above 60%. It could be these institutions were more sensitive to accountability for resource utilitization. Unit cost can serve as a benchmark for inter-college comparison and to provide standard unit cost and unit revenue profile for management information. Liverpool and Opara (1995) made a study of using the unit cost concept for building up models for budgeting and full allocations in U.K universities. Our study supported the views of these writers on the importance of unit cost as a management tool.

*Unit Cost for Pricing*

8% of the respondents thought that unit cost was usually or sometimes helpful for pricing a course. Tertiary institutions (75%) and other institutions (71%) which were accountable for their profit used this technique for pricing. Their usage was higher than the not-for-profit secondary and primary schools. This is to ensure that unit price is not below the unit cost. The funding bodies should set unit of resource at a value at least equivalent to unit cost. Carr (1997) stated that unit costs data is essential for pricing products and services, measuring the relative profitability of products and services and establishing measures of efficiency, but unit costs do not measure the quality of provision, simply the efficiency of provision. The difficult management task is to meet unit cost targets while holding or improving quality targets. All colleges unit cost systems must be aligned with a system of quality performance measures so that trends and changes in both can be measured on a course by course basis.
Unit Costs assist in Setting Targets and Monitoring Performance

Jones (1989) used optimum unit cost, the minimum unit cost that one can reasonably be expected to attain, as a measurement of setting targets and measuring actual performance against them. Agreements about optimum performance parameters are established through negotiation between the principal and each head of department individually. The involvement represented by meaningful consultation and the mechanisms of accountability are accomplished by teachers assessing the work of those in other parts of the college so that there is a sense of corporate responsibility for the performance of the college. In the study, 66% of the questionnaire respondents thought that unit cost was usually or sometimes useful in setting targets and monitoring performance. In particular, tertiary institutions (75%), other institutions (71%) and secondary schools (68%) used this approach. The interviews gave the same indication with 60% of the interviewees using this approach. The findings confirmed the relatively wide extent of using unit costs in Singapore institutions.

Unit Cost Measures Profitability and Efficiency

Carr (1997) claimed that unit cost data measures the relative profitability of products and services and establishes measures of efficiency. 65% of the questionnaire respondents thought that unit cost was usually or sometimes useful in measuring profitability and efficiency of a course. In particular, tertiary institutions (100%), other institutions (72%) and secondary schools (71%) used it. The interviews gave the same indication. This appeared to concur with Carr’s (1997) assertion.

Unit Cost, a Quick Evaluation of Financial Performance

61% of the respondents think that unit costs provide a quick evaluation of the financial performance of a course. Among them, tertiary institutions (100%) and secondary schools (61%) used this approach. This similarity could be due to their profit accountability.
Unit Cost Monitors Sales Promotion Efforts

35% of the respondents thought that unit cost is usually or sometimes helpful to monitor sales promotions. The low usage might be due to the institutions not doing sales promotion as much as business organisations. For other institutions (mostly privately-owned), 43% of the respondents usually and sometimes used this technique. It showed that they had more sales promotion than the other institutions (e.g. tertiary 0%, secondary schools 32% and primary schools 7%). On the other hand, it might indicate that unit cost is not very helpful in monitoring sales promotion effort. The interviews gave the same conclusion as the questionnaire.

Unit Cost for making decisions

About 70% of the questionnaire respondents thought that unit cost were (usually or sometimes) helpful for making decisions such as whether to run or drop a course (71% of respondents), or in evaluating alternative delivery methods (69%). On the other hand, about 30% of them did not use this method for making decisions due to the limitations of unit cost or the extent of knowledge of the principals/administrators.

This is reflected in their remarks:

"I don't know much about unit cost"

"Not applicable for diploma course."

"Our school is a non-profit organisation"

Therefore, training on unit cost should be provided to them.

Variance Analysis

The difference between budgeted and actual performance is termed "variance". Variance analysis is a skill of interpretation and many writers have suggested that this provides feedback for the control system. Knight (1993) explained that variance required analysis and interpretation to find out the cause of variance. Arnold and Hope (1989) mentioned that the generation of variances provides feedback for the control system and functions as a spur to immediate remedial action if actual performance was less good than
expected. It also functions as input into the budgetary process for future periods. Ward, Srikanthan and Neal (1991) claimed that variance analysis should be incorporated in the technique of "management by exception (MBE)", which assumed that everything was on target unless it was reported not to be. This technique should massively reduce the volume of financial reporting, while still ensuring that all levels of management were provided with the decision support information, which they require. If the variation is greater than acceptable levels, the deviation from plan would be reported to the appropriate level of management who could then take action to correct the problem or modify other areas of the plan.

The study showed that variance analysis was commonly used in Singapore institutions. It was the third most commonly used management accounting tool. On the average 60% of questionnaire respondents usually or sometimes used the technique. Among them, tertiary and other institutions had higher usage; this might be due to greater demand for monitoring their resources. All interviewees agreed that when actual figures exceeded budget, they needed to find out the reasons for variance. This information was useful to them and they would try to work within budget without incurring unfavourable variance.

Explanation of Variance

73% of the questionnaire respondents claimed that they usually or sometimes had to give reasons to explain the variance and 66% of them confirmed that variance analysis was usually or sometimes useful for their daily operation. Therefore variance analysis was commonly used in Singapore educational institutions. This also applied to most of the interviewees, except for the administrator from the small private school.

Highlight Problems

Budget cost is a predetermined future cost of rendering a service. It is established at the beginning of the period. Variance analysis compares budget to actual performance. It might be performed by program, cost centre or department. An analysis of variance might be conducted yearly, quarterly, monthly depending upon the importance of
highlighting a problem quickly. 68% of the questionnaire respondents thought that variance analysis usually or sometimes highlighted the problems. Among them, tertiary institutions (100%) and other institutions (86%) found variance analysis useful in highlighting the problems.

Control Over-spending

Brian Knight (1993) alleged that variance suggested a trend caused by a change in the volume of goods and services supplied. It might be possible to control the use of the item so that its volume reverts to or near to the planned level. 68% of the questionnaire respondents thought that variance analysis usually or sometimes was useful to control over-spending. Among them, tertiary institutions (100%) and other institutions (57%) found variance analysis useful in controlling over-spending.

Standard Cost Monitors Performance

Besides using a standard costing system for budget preparation and as a benchmark for efficiency, Levacic (1997) viewed standard cost as an important means for budgeting and formula funding for schools. A standard cost is the level of cost which should be incurred for any given of activity. The standard costs of a school (or college) of efficient size for its sector could be built up and determined. Budget is determined 'bottom-up' as a summation of various standard cost elements. 57% of the questionnaire respondents thought that standard costing was usually or sometimes used to monitor performance. Among them, tertiary institutions (75%) and other institutions (86%) found standard costing useful. However, only one out of six interviewees was familiar with this system, asserting:

"I use standard costing, this is some form of standard cost which is useful for budgeting and controlling costs. If there is over-spending, I have to give an explanation".

This showed that most schools principals were not familiar with this technique. Therefore, for successful implementation of the standard costing system, training is
required. The researcher suggests that the illustration and procedure for standard costing be incorporated in the proposed handbook for budgeting.

**Establishment of a Standard Costing System**

To facilitate preparation of a budget, a standard costing system should be established. Standard costs are predetermined costs. Actual performance is then comparable with the pre-determined standards. The variances would be analysed to investigate the cause and inefficiencies. This system should be introduced and implemented by the central body (e.g. Finance Division, Ministry of Education). The standard costing would serve as a benchmark for inter-school efficiency comparison. A standard purchase data bank could provide information on reliable suppliers to ensure efficient purchasing. It is a common practice for most authorities to adopt bulk purchasing contracts for supplies and services.

**Useful for Daily Operations**

Some writers view variance analysis as important in financial analysis and decision making. Some of the main benefits are: (1) motivating staff to achieve predetermined goals; (2) causing departments to focus on common goals; (3) assisting in costing and decision-making; (4) identifying problem areas in accordance with the “management by exception” approach; (5) encouraging communication within the organisation; (6) allowing cost control and performance appraisal (7) identifying who is accountable for poor performance so that corrective steps may be made (Shin, Siegel and Simon, 1996). Most of our Singapore administrators shared the same view, as 66% of the respondents thought that variance analysis was usually or sometimes useful for their daily operation. Among them, all tertiary respondents thought that variance analysis was useful for their daily work.

**Monitoring sales performance**

Only 32% of the respondents thought that variance analysis was usually or sometimes useful for monitoring sales promotion efforts. Among them, the other institutions recorded the highest percentage (57%). This was because most of the other
institutions are private schools which have greater need to monitor their sales performance.

The above showed that variance analysis was not commonly used by educational administrators for monitoring sales performance.

**Using Accounting Information**

Using Accounting Information was the fourth popular management accounting tool with 58% of the respondents using it in Singapore institutions. Most of the interviewees found it useful for controlling expenditure and cash flow.

*Control of Expenditure & Capital Expenditure*

The study shows that 83% of respondents use accounting information to control expenditure and 80% of them use it to control capital expenditure. The following remarks from the interviewees indicate the importance of this application:

"*Accounting information is useful to control expenditure. I need to know the actual expenditure and timing of the payment to plan cash flow. Further, it is very helpful for decisions about capital expenditure like buying a photocopier machine or office equipment where the amount is large. This is vital for all organisations*."

"I use accounting information to control expenditure, to plan cash flow, to make decisions on capital expenditure."

"Yes, accounting information is important to plan cash flow, to know when to pay the bill*."

"Yes, accounting information is useful*."

*Planning Cash Flow*

Cash flow planning is an important daily function for business. Davis (1994) claimed that although cash flow is not strictly a costing factor, it is important because it is a measure
of when money is spent. Schools should ensure the cash flow for the budget period is sufficient. If the inflows of cash are insufficient to meet cash disbursements, the school may find itself in a financially embarrassed position. On the other hand, too much cash on hand is undesirable, as excess cash should be utilized to earn income. Michael (1996) viewed cash budget as one of the main budgets; it provides a generalized view of the cash flow demand. The study showed that 71% of respondents usually or sometimes use accounting information to plan cash flow. The high rate of usage for the other institutions may be due to the fact that most of them are privately owned. All interviewees thought that they required accounting information for cash flow planning in order to ensure the school can settle its bills.

Evaluate Performance and the Profitability of the Institutions

Only 54% of the questionnaire respondents usually or sometimes used accounting information to evaluate performance of the institutions. Only 24% of respondents have usually or sometimes used accounting information to evaluate profitability. Among them, other institutions have a rate of usage of 71%. The high usage for other institutions might be due to the fact that most of them are privately owned. Since Government funded tertiary institutions, secondary and primary schools, profitability might not be as important to them. This reflected in their remarks:

"We are a Government school, profit is not important"

Generally, accounting information is useful to all principals for expenditure control, decision-making and sometimes for performance evaluation. Thus, in the workable model proposed for Singapore, an on-line data bank would be set up to provide relevant information to school administrators for decision making.

Decentralisation, profit/cost centre

Decentralisation of resource management derives from the belief that there are limits to the decision-making capacity of senior managers in an organisation. It recognizes the importance of involving managers at all levels in the organisation in decision-making and moves certain decisions to the lowest possible level. Responsibility centres are usually either cost centres or profit centres. Managers in charge of a profit
centre/cost centre are responsible for the profit and costs in their section. The system has the advantage of allowing responsible officials to react speedily to any changes in their own area of responsibility and allow corrective action to be taken. The administration decentralisation process implemented in the Mexican education sector since 1978 performed much better than the sector which did not practice decentralisation administration (Juan and George, 1993).

Decentralisation, profit/cost centre is the fifth commonly used management accounting tool (54% for Questionnaires) in Singapore educational institutions.

Cost Centre Assists in Allocating Resources & Controlling Expenditure

The objective of cost centre accounting is to identify where surpluses and deficits are being made within the organisation and also to give schools (or departments) a greater degree of independence over their own financial affairs. This is to make heads of school more cost and revenue conscious. (Tomkins and Mawditt, 1994)

About 63% of the respondents thought that cost centres assisted them in allocating resources and controlling expenditures. Among them, 100% of respondents are from tertiary institutions and 60% from the remaining institutions. It seems that tertiary institutions had more urgent need for cost centres due to their complexity in structure, which required clear identification of the accountability of the cost.

One of the interviewees claimed:

"Setting up cost centers is useful, I will know which departments spends more. They also know not to over-spend (interview 3)."

The study supports the views of the writers in the literature review.

Decentralisation, Cost Centres are useful in Controlling Cost

Similarly many writers viewed decentralisation and cost/profit centres as important measures for controlling resources. Levacic (1992) affirmed that decentralised
management is expected to provide both the motivation and the means for those actually working at the production end of the organisation to improve the quality of what they do. Financial management is strengthened by the participation of the departmental or local manager. Administrative heads take their financial responsibility more seriously. Brian Knight (1993) pointed out that cost centres and profit centres are to establish management accountability and responsibility. Each cost centre is responsible for its own budget and all expenditure incurred by it is debited from it. In fact, decentralisation and delegation are among the main features of Local Management of Schools in U.K. In our study, for decentralisation, more than half of the questionnaire respondents (52%) usually or sometimes thought that this structure was useful in controlling costs. Among them, tertiary institutions had 100% while the remaining schools/institutions had about 45% to 72%. It seems that tertiary institutions had more urgent need for cost centres due to their complexity in structure. As for the Interviewees, most of them supported the idea that decentralisation was useful.

**Profit Centre**

A profit centre structure helps to provide a clearer idea to top management of where in the group the overall profits are being earned. On the basis of "management by exception" top management can, therefore, focus their attention where it is needed. The psychological advantage of a profit centre structure is that giving a person more responsibility and freedom to act encourages him to use his resources as efficiently as possible and to seek increased revenues in order to improve his performance. (Tomkins and Mawditt, 1994).

Slightly less than half (47%) of the questionnaire respondents felt that profit centres gave the manager more responsibility and innovation. Among them, 100% of respondents from tertiary institutions and 57% of respondents from other institutions support this statement. This could be due to tertiary and other institutions being accountable for their profit. It could also be that less than 47% of secondary schools and primary schools respondents agreed to this statement because they are non-profit making organisations.
This was also represented by the different views from the interviewees:

For interviewees from Government schools:

"Profit centres are not relevant to government schools (interview 1)".

For an interviewee from a private secondary school:

"The school was too small to have different cost centres like other companies",
"But we have set up profit centres for different types of main courses, such as LCCI bookkeeping courses, IT courses and setting up cost centre to trace the cost. Cost centre is a useful measure to control cost and determine the profitability of the course (interview 6)."

The above showed that decentralisation and cost centres were considered as an important measure to manage resources and control cost. However, the support of the school administrator for profit centres is less than their support for cost centre. This might be due to the fact that most of the institutions were not for profit organisations except for the private secondary and commercial schools. As for the tertiary institutions, they are responsible for their financial performance.

The above showed that tertiary institutions (100%) and other institutions (60%) usually or sometimes made use of decentralisation, cost/profit accounting as a management tool, but only 46% of secondary and 52% of primary schools did so. This might be due to tertiary and other institutions requiring more control over their resources while secondary and primary schools were generally government funded and their need might not be so urgent. Generally, accounting information is useful to all principals for expenditure control, decision-making and sometimes for performance evaluation. Thus, in the proposed workable model for Singapore, a costing system should be set up for and structured to the school requirements so that relevant costing information may be available to school administrators for decision making.
**Ratio Analysis**

Ratio analysis is the technique for interpreting information by comparing one item of statistics with another item. It is only a guide and must always be used in conjunction with other information of a comparable nature. Ratios are useful for comparative purposes. Numerous ratios can be employed for the efficiency of school operations. For effective application of these techniques, schools administrators should receive training in this area.

The study showed that 31% of the respondents claimed that ratio analysis was usually or sometimes useful in their daily operations. Among them tertiary institutions had the highest rate of usage (75%). It might be due to their structural complexity and higher proficiency of management accounting techniques of their administrative staff. The low usage of such techniques in secondary schools (18%), other institutions (18%) and primary schools (51%) indicated the requirement of interpretative skills training for administrative staff in these institutions. The interview revealed similarly that only two out of six interviewees were familiar with this technique.

**To Compare Expenditure Items**

44% of respondents usually or sometimes made use of ratio analysis for comparing expenditure items. Among them, tertiary institutions had a 100% rate of usage, primary and secondary schools had less than 40%, and other institutions had 18%. The low usage for other institutions might be due to the reason that most of them were privately owned, less complicated and had no rigid analysis requirement, while the structure of tertiary institutions was more complicated and required formal analysis and reporting. As the expenditure for secondary schools and primary schools was mostly funded by Government, there was no urgent need for expenditure analysis.

**To Compare Income Items**

36% of respondents usually or sometimes made use of ratio analysis for comparing income items. Among them, tertiary institutions were 75%, secondary school and other institutions were less than 23% and primary schools were 18%. The low usage
for other institutions might be due to their less complicated structure, while the structure of tertiary institutions was complicated and required formal analysis and reporting. As the expenditure for secondary and primary schools was mostly funded by government, there was no urgent need for income item analysis.

To Compare Statistics

Only 32% of respondents made use of ratio analysis for comparing statistics items. Among them, tertiary institutions had 100%; primary and secondary schools had less than 44% and other institutions had 20%. Similarly, the low usage for other institutions might be due to the reason that most of them were privately owned, had less complexity and had no rigid analysis requirement, while the structure of tertiary institutions was complicated and required formal analysis and reporting. Since the expenditure for secondary and primary schools was mostly funded by Government, there was no urgent need for expenditure analysis. Furthermore, the administrator might not be familiar with the technique.

The above showed that at tertiary institutions, 88% made use of ratio analysis as management tool, but the extent of usage for secondary, primary schools and other institutions was low (about 30%). This might be due tertiary institutions being more structurally complicated which required more reporting, and the administrators in tertiary institutions being more experienced in using this as an interpreting tool. The administrators of secondary and primary schools and other institutions were not so familiar with the techniques and they required training. This was also revealed by the interviewees. Thus, in the proposed workable model, principals or managers should be provided with adequate training. Alternatively, a bursar should be appointed as the management accounting administrator so that he may relieve the principal from such a task.

Other Management Accounting Techniques

Marginal Cost for Decision Making
Marginal cost is a significant costing factor and closely related to the concept of threshold level of expenditure and to marginal revenue. The marginal cost is the cost of taking one extra student or reducing a group by one student. In our study 30% of the survey respondents usually or sometimes used the technique to decide whether to start a class or a programme. This low usage could be because this concept was too technical to them. Other institutions (44%) and primary schools (34%) used marginal costing more than the tertiary institutions (25%) and the secondary schools (19%). Most of the other institutions were privately owned, therefore they might be more concerned with cost control. This seemed to be reflected in the interviews, where only the private commercial school always made use of marginal costing because this helped them to decide whether to start a class, while the other institutions were non-for-profit.

Performance Indicators

Financial measurement is only one aspect of performance measurement, and there are other measures of service quality e.g. number of students/parents, complaints received and internal audit assessment. Brignall, Fitzgerald, Johnston and Silvestro (1992) stressed that the managers of every service organisation needed to develop their own set of performance measures to help them gain and retain competitive advantage. This set will be affected by the interaction of three contingent variables: the competitive environment they face, their chosen strategy and the type of service business they are running. Therefore educational institutions should develop their own set of performance measurement.

Performance indicators are the signals of success, which will be used to indicate whether the objective has been achieved. There is a tendency for quantitative easy-to-measure performance indicators to dominate our thinking, despite the evidence about the importance of the more qualitative indicators of school life (Preedy, Glatter and Levacic, 1997). Carol and Gibbon (1989) claimed that to evaluate school performance, the indicators must be comparative and at an appropriate level of aggregation to highlight the problem.
Almost 60% of the author's survey respondents used performance indicators to evaluate performance. The fairly high percentage indicated that administrators used performance measurements to supplement financial measurements.

The institutions of higher complexity required other forms of performance measurements because traditional financial measurements did not fulfil the requirement. All tertiary institutions used performance indicators to evaluate performance, while only 49% of the respondents from primary schools, 48% from secondary schools and 43% from other institutions used these techniques. As to the interview, most of the interviewees pointed out that this technique was useful.

**Apportioning Cost and Relocating Cost**

Only 32% of the respondents usually or sometimes used breakeven analysis to decide whether to start a class or a programme. Among them, 63% of other institutions and 50% of tertiary institutions used this technique while less than 15% of secondary and primary schools used breakeven analysis. The low rate of usage might be due to difficulty in understanding this concept, while there was no urgent need for them to perform such analysis, as the expenditures for secondary and primary schools were mostly funded by government. This also applied to the interviewees.

**Using Direct Cost, Variable cost, Fixed Cost, Overheads to Monitor Cost**

Cost information is like any other data. It needs to be organised into a pattern before any significance can be read into it. The cost data of a school can be arranged in numerous ways to bring out difference features, such as direct cost, variable cost fixed cost and overheads. In traditional accounting, indirect costs, the overheads, are allocated arbitrarily without being traced to their cause. This provides a distorted picture of product costs since cross-subsidization between products results from the misallocation of overhead costs between the products.

41% of the questionnaire respondents used direct cost, variable costs, fixed cost and overheads allocation to monitor costs. Among them, the tertiary institutions were 75%, other institutions were 57%, while primary schools and secondary schools were
about 33%. As the structure of tertiary institutions was complicated, cost classification and overhead allocation for formal analysis, reporting and control was required. On the other hand, Government funding for the secondary and primary schools expenditure meant that there was no urgent need for detailed cost analysis. Moreover, the low usage might be due to difficulty in understanding this concept. For other institutions, most of which were privately owned, they were more likely to require detailed cost analysis to monitor cost. This also applied to the interviewees. Thus, in the workable model proposed in Singapore, a costing system should be set up for and structured to the school requirement so that relevant costing information would be available to school administrators for decision making.

*Activity-based Costing (ABC)*

Traditional cost allocation has distorted the real costs of production. In Activity Based Costing, the allocation of department’s overhead cost to products is made on the basis of the cause/effect relationship between the product and the activity levels it causes in the department. ABC and related methods are keys to the overall understanding of cost behaviour, and in determining long-run course costs. ABC thus provides organisations with a more equitable in allocation of the cost of each work activity and furnishes a better understanding of the factors that are driving the cost of each activity. ABC can help not only with tighter financial management and resource allocations, but also with total quality management. In our study, 32% of the questionnaire respondents usually or sometimes used ABC to monitor their resources. Among them, 100% of the tertiary institutions’ respondents usually or sometimes used ABC, while less than 40% of other institutions/schools used this technique. No interviewees confirmed that they use ABC. It seemed that the use of ABC was getting more popular in tertiary institutions. This trend reflected the situations in U.K. and the United States (Gordon & Charles 1998; Groves, Pendlebury and Newton, 1994).

*Breakeven Analysis to Make Decisions*
Breakeven or cost-volume-revenue (CVR) analysis is not limited to profit making firms, as it also pertains to non-profit organizations. The CVR model not only calculates the breakeven level, but also helps in decision-making, (e.g. number of students who can be served, tuition fees to charge etc). Only 32% of the respondents usually or sometimes used breakeven analysis to decide whether to start a class or a programme. Among them, 63% of other institutions and 50% of tertiary institutions used this technique while less than 15% of secondary and primary schools used breakeven analysis. The low rate of usage might be due to difficulty in understanding this concept, while no urgent need existed to perform such analysis as the expenditure for secondary and primary schools was mostly funded by Government. However, one interviewee indicated its usefulness in her remarks:

"We use breakeven analysis for the enrichment programme and trips, to find out at least how many students should participate so that the fees collected can cover the costs (interview 4)."

Returns of Capital for Decisions to Rent or Buy New Premise

Only 23% of respondents usually or sometimes made use of return of capital for decisions to rent or buy new premises. Among them, only other institutions had a rate of usage of 63%, tertiary institutions 0%, secondary schools had 22% and primary schools had 11%. As for the interviewees, besides the private secondary school which operated as a business enterprise, the other interviewees rarely used it. The low rate of usage might be due to most of the capital expenditure for tertiary institutions, secondary and primary schools being government funded. As such, there was no urgent need for expenditure analysis. As to the other institutions, this might be due to the reason that most of them were privately owned; they performed this analysis more often owing to their own requirements.

DCF to Evaluate Long-term Projects

Discounted cash flow (DCF) techniques are the methods of selecting and ranking investment proposals such as the net present value (NPV) and internal rate of return
(IRR) methods where time value of money is taken into account. The school administrators require proper training in order to be proficient in using the techniques.

Only 20% of respondents usually or sometimes made use of DCF techniques for evaluation of long term projects. Among them, tertiary institutions had a rate of usage of 75%, other institutions 50%, while primary and secondary schools had less than 20%. The low rate of usage for primary and secondary schools might be owing to long term projects for secondary and primary schools being mostly funded by government. As such, there was no need for long term expenditure analysis and furthermore, an administrator would need to have training to use this method. On the other hand, other institutions, most of which were privately owned, needed detailed cash flow planning for long term investment projects. The structure of tertiary institutions was also more complicated and greater formal analysis and reporting was required. The size of tertiary institutions also allowed them to employ professional managers to perform detailed analysis.

**Variation of different types of Institutions/schools for Management Accounting Techniques**

Generally the study showed that the types of schools might affect the type of techniques used.

Tertiary institutions used all the techniques: accounting information, budgeting, variance analysis, cost centre, unit cost, ratio analysis, and other management techniques. Because they required more effective tools to manage resources in relation to their complexity in structure and fund availability, tertiary institutions could employ a professional bursar to apply more difficult management accounting techniques. On the other hand, other institutions needed techniques like breakeven-analysis, return of capital and cost apportionment for daily business operations.

Government generally funded secondary and primary schools. These institutions had no urgent need for advanced management accounting techniques. In addition, the administrators in these schools might not have the required skill and knowledge to use
these techniques. Therefore, secondary schools relied more on budgeting, accounting information and variance analysis, while primary schools used more budgeting, accounting information, variance analysis and cost centre. Furthermore, to satisfy the Ministry of Education’s mandatory requirement, they needed to prepare budgets and to explain over-spending.

Other institutions used less budgeting, but more accounting information, variance analysis, profit/cost centre, and other management accounting techniques. This might be owing to other institutions being generally privately owned and smaller in size, and concerned more with short term existence and returns rather than long term strategic planning.

Training and Engagement of a Bursar

Levicic (1989) stated that in the U.K, financial management is unlikely to be within the expertise of classroom teachers. The overall responsibility is vested with the head and governing body. Thus training should be directed in the main at head teachers and specialist administrative staff. However not all principals are willing to take up the challenge of efficient resource utilization and allocation. Some principals might think that it was not within their purview, as expressed by one of the interviewees (interview 4):

"I think management accounting is not useful for my work. Principals should pay more attention to professional matters, while accounting matters should be left to the school administrator to take care of."

Nevertheless, the majority of the principals/administrators had positive attitudes towards training, as reflected by their remarks:

"Sure, I want training on this, especially more advanced techniques, such as break-even analysis, activity based costing and marginal costing, performance indicator, I must understand these even though I am not doing the job (interview 1)."
"In those days, we did not receive much training, the only briefing was from your predecessor, the only accounting procedure was contained within the IM (Instruction Manual). I think we should know more (interview 2)."

The success of the application of techniques depends largely on the principals' /administrators' knowledge of management accounting techniques. Since the majority of them have a positive attitude towards training, this indicates that training in these areas is feasible and essential for the improvement of resource management in Singapore educational institutions. A better understanding of management accounting is important, so as to enable school leaders to make better decisions on efficient resource utilization and allocation, while being more amenable to changes in management accounting systems, even though the principals/administrators might not be doing the accounting work themselves.

On the other hand, the negative view of one of the interviewees also supported Harold and Hugh's (1998) views that "the financial responsibility will be so time consuming that it cannot be doubted that the appointment of a bursar with specialist accountancy qualifications and/or will be essential". Emerson and Goddard (1993) also reported that "Head teachers and their deputies, in particular, are concerned that the increased workload of local school management prevented them from concentrating on leading teaching and learning in schools." To relieve the principal for such a chore, if resources permit, the institution should look outside the educational sector for managers with financial and business background to take responsibility for resources and the large numbers of support staff in schools (Bush, Coleman and Glover 1993). Generally, the study supported the need to appoint a professional bursar to relieve the principals from their financial responsibility.

Limitations of Present Management Accounting Techniques

As mentioned in the literature review (Chapter 2), there are limitations in management accounting such as limitations of a costing system, subservience to the financial accounting system, little attention paid to non-accounting information, failure to report
on non-financial issues such as quality, reliability, satisfaction and individual motivation. Administrators should not make decisions based on single management accounting techniques or solely from management accounting information. The study also showed that there were a significant number of respondents who felt that the techniques for accounting information (32%), standard costing (43%), unit cost (34%) and performance indicators (41%) were not useful in evaluating the performance of the institutions/schools. Therefore, we should also consider other management accounting techniques, which can also measure non-financial issues.

For the workable management accounting model, the author proposes that besides performance indicators, other forms of management accounting measurement such as Balanced Scorecard (see Table 7.6) used in business and industry could be modified and adopted for use in educational institutions.

Balanced Scorecard

As mentioned in the literature review (Chapter 2), the use of Kaplan and Norton's Balanced Scorecard (1993) is popular in commerce and industry. It uses new measures at divisional level, both in terms of value based metrics which take these value drivers and summarises them into a single measure. In view of limitations in the present management accounting model mentioned above, the author proposes that for school management accounting, schools may adopt the 1993 Kaplan and Norton's balanced scorecard model to measure their overall performance by the four critical issues. They are:

1. Students' perspective: measurement focuses on student requirements such as quality of the course, passing rate, score on sports and extra-curricular activities performance, score on community services, responsiveness to remedial action, and competitive fees.
2. Process capability: measurement focuses on school building and facilities i.e. computer room, library.
(3) Innovation and learning perspective: measurement of technology leadership, e.g. new language teaching methods, new courses placed, on Internet, responsiveness to changes in technology to meet student needs.

(4) Financial prospective: measurement in terms of cash flow, funding, growth in income and market share. (See Chapter 7, Table 6)

**Conclusion**

In this research, two vital questions arise: One question concerns the present situation in Singapore schools/educational institutions with respect to the adoption of the management accounting model and to what extent management accounting is presently being implemented. Another question concerns the value of the supposed benefits for schools/educational institutions and those who work in them arising from the adopting of such a system in full. Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified.

From the analysis, among the seven groups of techniques listed in the questionnaires, there are five groups of techniques that elicited responses more than 50% of principals/administrators of “Usually” or “Sometimes”. They are Budgeting (88%), Unit cost (63%), Variance analysis (63%), Accounting information (58%) and Profit/cost centre (54%). This indicates that budgeting is the most popular tool, while unit cost and variance analysis are also popular. Accounting information and Profit/ cost centre are also commonly used. On the other hand, Ratio analysis (35%) and Other management accounting techniques (34%), were used by below 50% of the principals/administrators. It seems that Ratio analysis and Other management accounting techniques are not so commonly used.

In Singapore, budgeting was the most commonly used technique for planning and controlling expenditure. Most of the principals recognized the need for human motivation, while also being cognisant of the problems of budgeting. Unit cost and variance were the most popular analysis techniques used by the administrators. Accounting information was generally important to all institutions for decision making.
The usage of decentralisation, profit/cost centres depended on the size and complexity of institutions, being more widely used in tertiary institutions rather than in schools. Ratio analysis and other management accounting techniques were not popular in schools but were commonly used in tertiary institutions and other institutions which were either autonomous or privately owned. They might be more concerned with cost control. It was also noted that some uncommon techniques like activity based costing were also used in tertiary institutions. Furthermore, the size of the tertiary institutions allowed them to employ a professional manager to perform detailed analysis.

Similarly, all six principals/administrators who were interviewed agreed that they made use of management accounting techniques for their operations. Budgeting was the most popular technique, while variance analysis, decentralisation and profit centres were commonly used. Unit cost, ratio analysis and other management accounting techniques were not so commonly used by the interviewees.

The study showed that management accounting techniques were applicable to a large extent, to the Singapore educational institutions/schools. Most of the survey respondents (75%) thought that these techniques were useful for their work, and more than half of them (58%) would like to have training in management accounting techniques. This was similar to the opinions obtained from the interviewees.

The study showed that not all Singapore schools applied a full management accounting model. The shortcomings of the present situation include inadequacy of cost structure and costing systems, unavailability of database for financial analysis and cost information not properly organised. These deficiencies were reflected in low application rate; for some of the techniques in the questionnaires or by remarks from the interviewees. These had been discussed in the earlier section. Therefore the current situation is inadequate in that Singapore schools did not reap the full benefits of adopting the full management accounting model, even though the extent of using the five groups of techniques was more than 50%. This is the concluded result of this study. In order to overcome the deficiency of the present system, the researcher has proposed to implement a Model of Finance in Singapore Education to replace the current conventional system.
The author also proposes that other forms of measurement such as balanced scorecard used in business and industry could be modified and adapted for use in educational institutions as a single measure of the performance of a school/institute (See Chapter 7, Table 7.6). The author also proposes that a budget handbook should be prepared and a standard costing system should be implemented to guide and assist principals in budgeting. An integrated computerised reporting system of financial analysis model to serve as a relational database could be set up to provide additional information for decision-making. This database should contain not only management accounting information but also include other non-financial information, such as test scores, extracurricular activities performance, score on community services, quality of the courses etc. It provides a dynamic relational database for the principals/administrators for information and decision making.

A minority of principals/administrators did not think these techniques were useful for their work and would not like to have training in management accounting techniques. This showed that a minority of principals are still distinctly unreceptive to the techniques. One interviewee indicated that they should not be concerned with non-professional matters. As not all principals were willing to take up the chore of resources management, the study supported the need for appointing professional bursars to relieve the principals from their financial responsibility. These measures may assist in overcoming the human side of the inadequacy of the present system.

The success of the application of the techniques depends largely on the principals'/administrators' knowledge of management accounting techniques. The positive attitudes towards training indicated that training in these areas was feasible and essential for resource management in Singapore educational institutions, while the school leaders would be more amenable to the need for changes for the improvement of management accounting systems. Therefore, the study supported the view that suitable training in management accounting should be provided to all principals and administrators.

In short, the study shows that most of the respondents have a positive view of management accounting techniques. This positive response indicates that most senior managers or principals view management accounting as an valuable tool for them to
manage current operations, budget and develop future plans. Most of them would like to have training in management accounting. The study shows that the usage of management accounting techniques is extensive in Singapore educational institutions.
Chapter 7

Conclusion
Chapter 7 Conclusion

An Overview

Management accounting is one of the most important tools for managing resources because it provides the required information for management decisions. From the researcher's experience, there is a need for systematic management accounting in Singapore educational institutions. In this research, two vital questions arise: One question concerns the present situation in Singapore schools/educational institutions with respect to the adoption of the management accounting model and the extent to which management accounting is presently being implemented. Another question concerns the value of the supposed benefits for schools/educational institutions and those who work in them, arising from the adoption of such a system in full. Thus, the extent to which management accounting is used in Singapore educational institutions and the degree to which it informs the management of the current budget and future planning, needs to be empirically verified by this research. This is the research problem addressed by this thesis.

Therefore the purpose of this study is to find out the extent of the application of management accounting techniques in Singapore educational institutions, and the attitudes of the school administrators towards these techniques. This information will help the researcher to design a framework of integrated finance model to establish an ideal management accounting system in Singapore educational institutions/schools to meet the present challenge of developing schools as a business enterprise. In this study, the primary empirical source was the questionnaire survey of school principals and administrators. Interviews were also conducted as a triangulation measure to verify the primary source of input.

Summary of the findings

The extent to which the findings have answered the research question

The extent of application of management accounting techniques in Singapore
The study showed that the majority (75%) of the respondents to the questionnaire thought that management accounting techniques were useful to their work and most of them expressed a desire to have training in these techniques. This shows that the administrators of Singapore educational institutions are generally supportive of the use of management accounting as a management tool to manage resources in educational institutions and were willing to learn more about the application of these techniques.

The study showed the following:

(a) What is the extent of using accounting information to make decisions?

The study showed that 58% of the respondents made use of accounting information for controlling expenditure, purchase of capital expenditure, cash flow planning and performance evaluation. Most of the schools are non-profit making, therefore only 24% of respondents used this to evaluate the profitability of their institutions. This is not very popular for determining when to start new class or a new programme, or to evaluate the performance of a division. The study shows that training is required in order for the principals/administrators to become proficient in using accounting information. The high rate of usage in tertiary institutions and other institutions signifies that the administrators in these institutions were more proficient in management accounting.

(b) What is the extent of using a budgetary system?

Many writers view budgeting as the most important management tool for strategic planning, coordination and control, for relating expenditure to objective achievement and as a useful means of asking for more funds (Arnold & Hope, 1989; Levacic, 1989; Davis, 1994). The study also indicates that most of the principals/administrators in Singapore institutions share the same view. Above 90% of them used a budgetary system for planning, control and coordination, except that other institutions such as kindergartens
and commercial schools had a slightly lower application. These institutions are small; they are more concerned with actual operations.

(c) What is the extent of using variance analysis?

Variance analysis is a skill for interpretation; it provides feedback for the control system (Knight, 1993 and Arnold & Hope, 1989). This is the third most popular technique in Singapore (60%). Standard Costing is fairly useful (59%) for monitoring performance. The high rate of usage of this technique (83%) in tertiary institutions could be due to the higher proficiency of administrators in tertiary institution in this technique.

(d) What is the extent of using unit cost and unit income?

Knight (1989) stressed that unit cost are the most powerful but under-used weapon in the financial manager's armory. Fielden and Person (1989) claimed that unit cost is preferred as a measure of resources impact. The study showed that this technique is not under-used, in fact it was the second most commonly used technique (63%) in Singapore schools, especially popular in the tertiary institutions.

(e) What is the extent of using ratio analysis?

Ratio analysis is not commonly used techniques in Singapore (31%), even though it is another important tool for interpreting financial information. The low rate of usage could indicate that the Singapore school administrator is not competent in using this technique. The need for proper training is compelling. It is surprising that there is a very high rate of usage of this technique in tertiary institutions. A likely explanation could be that most of the respondents in these institutions are more proficient in management accounting, being finance managers, accountants and administrators rather than school principals.

(f) What is the extent of using decentralisation, profit/cost centre?
Profit centre, cost centre and decentralisation are measures to establish accountability and responsibility. They are more applicable to organizations with more complicated structures requiring greater management information for operations. Among the three techniques, the study shows that decentralisation and cost centre are slightly more popular than profit centre since most of the schools are not-for-profit organisation. More than 60% of the respondents regarded cost centres useful in allocating resources and making managers more careful in their spending. Profit centre is less popular, with only 47% of respondents thinking that it gave the manager more responsibility and innovation, while 44% considered it useful for accounting for revenue. There was a greater extent of application in the tertiary institutions (88%), showing that tertiary institutions are more devolved and more financially focused than schools. This reflects the situation in U.K. (Bourn, 1994; Tomkins and Mawditt, 1994).

(g) What is the extent of using other management accounting techniques?

Other management accounting techniques comprise those techniques used in business but not commonly employed in education. Some of them require training before application. Activity based accounting was only introduced in education in the last ten years. Even though the study shows that response for usage of these techniques is low, the results are encouraging. The educational administrators in tertiary institutions (60%) and other institutions (53%) are more willing to attempt new techniques to improve school efficiency. This could be due to the greater competency of the administrators, and the requirement for more stringent resource control at these institutions. Tertiary institutions use more advanced techniques like activity-based costing, overhead allocation for tracing, and accounting for the resource usage or the sub-units, but the techniques are not commonly used in secondary schools (27%) and primary schools (30%). Almost 60% of the respondents, especially those from tertiary institutions, used performance indicators to evaluate performance to supplement the financial measurements. This signifies that institutions with structural complexity require other forms of performance measurement, as traditional financial measurement might not fulfil their needs.
In summary, these findings indicate that in Singapore educational institutions there is a large extent of using management accounting systems. The extent of usage depends on the type of institution, the structural complexity, and the competence of the principals/administrators in using these techniques. Depending on the type of institution, the extent of usage and the type of techniques applied may vary. It seems that tertiary institutions apply more management accounting techniques than other institutions. Primary schools apply slightly more than secondary schools, while private schools and commercial schools use more management accounting techniques in some areas. The lower rate of usage in secondary schools and primary schools and other institutions (especially private commercial schools) also signifies that there is still a lack of management accounting system in Singapore educational institutions, even though most Singapore principals and administrators are supportive of the use of management accounting. The types of management accounting techniques applied in Singapore institutions/schools is quite extensive, in that all the techniques mentioned in the questionnaires are used. (e.g. using accounting information, other management accounting techniques, decentralisation, and profit/cost centre). However the more advanced techniques such as activity based accounting (ABC), overhead allocation, cost classification, discounted cash flow (DCF), break-even analysis and performance indicators are used primarily in tertiary institutions due to their stringent resource requirement and the availability of administrators with greater accounting proficiency.

The study shows that the use of management accounting techniques is extensive in Singapore educational institutions. However, the study also confirms that Singapore educational institutions still have not adopted the management accounting system in full. The inadequacy of the present system and the limitations of the technique have been identified. As the study shows that the existing Singapore system has not achieved this objective, the researcher suggests implementing an ideal integrated Model of finance in Singapore. For successful implementation, the researcher suggests that the following are necessary:

1. To set up costing system at site level for conformity and organisation structure requirement.
(2) To set up standard costing system which serves as a benchmark; a challenging target for budgeting, planning and evaluating performance.

(3) To provide suitable management accounting training to principals and administrators so that they are competent in using the system, or at least supportive of the system.

(4) To provide a budget handbook and handbook on techniques to serve as a guideline, reference book and training.

(5) To appoint bursars as management accounting administrators and relieve principals from administrative chores.

(6) To introduce an overall performance indicator (balanced scorecard system) to facilitate overall performance comparison among schools.

A Model of Finance in Singapore Education

The study shows that the current management accounting system in Singapore schools still has not achieved its objective. The Ministry of Education is now more liberal and allows more autonomy at school; therefore, the researcher suggests implementing an ideal integrated Model of Finance in Singapore, to avoid wastage and free more resources for innovative projects.

The existing management accounting system in schools is implemented independently without interaction with other systems in school. The ideal Model of Finance in Singapore Education (Diagram 7.1) should be an integrated system to be linked and interact with other systems within or outside the organisation to facilitate analysis and comparison.

The ideal Finance Model of Education consists of: (1) An effective costing and pricing system structured according to the organisation requirement; (2) A Standard Cost system (see Appendix 4); (3) a Financial Analysis Model. (See Table 7.2, Table 7.3); (4) A Budget Handbook and a Handbook for Accounting Techniques (see Appendix 5, 6 and 7); (5) Training; (6) Balanced Scorecard for overall performance (see Table 7.4 and Table 7.5).
Initially these systems are independent, but ultimately the system could be integrated to maximize benefit. Although the Finance Model does not provide the answer to complex policy issues in education, it does provide a dynamic relational data base to be used in combination with test scores, attendance, teacher qualities, and the like to improve the productivity and efficiency of schools. Schools may use its resources inefficiently, if schools were made more efficient, funds would be released for new and innovative programs and that could help students improve their performance. The followings will illustrate the model in greater detail:

*Costing and pricing system*

The system is at site level. The costing classification should be clearly defined and configured (such as fixed cost, variable cost, overhead etc.) so that the required data is gathered, analysed and reported in accordance with the classification. The cost accounting system will place emphasis on activity-base that traces costs from their sources to the classroom and student. The effective costing system should embrace all
activities and evaluate systematically the full costs and revenue generated by such a
diverse portfolio of services. There is a need for managers to operate in a climate of a
continuing reduction in unit of resources and to use data to inform future strategies and
value-for-money assessments. For schools of limited size, the system focuses more on
cost data and control. As the institution grows in size (tertiary institutions), management
increasingly has to judge priorities against scarce resources as well as recovering full
costs for any external work. Effective costing and pricing will supply the relevant data to
support such judgement and decision making. The system should have these features:

(1) Clear definition and differentiation between costing and pricing.
(2) Consistency of practice, designed to maximise cost recovery and claim all indirect
costs (overheads).
(3) Implement a uniform approach across the sector to cost all the activities and provide
transparency for accounting of public funds.
(4) Provide timely accurate costing and pricing information so that decisions can be
focused or improved.
(5) The costing process includes: determining the purpose for which the information is to
be used, identifying the key activities which will be costed, identifying the cost
drivers for these activities, attributing costs to the identified activities and analysis
and reporting of the results.
(6) The senior decision-making body in the organisation must sponsor the system. The
head of the institution must take initial responsibility for securing support from staff;
and senior managers within the institution should accept responsibility for the
implementation and support of the system. It must not be seen as a bureaucratic
finance system.
(7) The kind of management accounting technique applicable will be dependent on the
individual requirement of the institutions. (e.g. budgetary system, unit cost, overhead
allocation.)
Implementation of an effective costing and pricing strategy

For implementation of an effective costing and pricing strategy the following is required:

1. The support and attention of top management: since the approach will involve substantial and major cultural change, the support of top management is essential.

2. The formation of a steering committee: A steering committee is needed to oversee the implementation. This requires multidisciplinary involvement, including top management and faculty staff.

3. Need to disseminate good practice through formal training and training documentation.

4. The results of the costing exercise will inform the pricing process. However, prices are determined by a range of factors including market forces, limitations dictated by specific research sponsors and a need to capture market share, even if this results in prices below cost or predetermined margins.

The standard costing system

The central body (e.g. Finance Division, Ministry of Education) should implement the standard costing system. Standard cost is an important method of budgeting. The standard costs of a school (or an institution) of efficient size for its sector would be built up and determined. This system provides a challenging target which individuals are motivated to achieve; while a prediction of future cost assists in setting budgets and evaluating performance. The costing system mentioned above will work in hand with the standard costing system which provides information of a school (or college) of an efficient size. A standard purchase data bank, which provide information on reliable suppliers to ensure efficient purchasing. It is common practice for most authorities to adopt bulk purchasing contracts for supplies and services.

For comparison of standard income and cost with budgeted and actual income and cost, please refer to Appendix 4.
Financial Analysis Model (FAM)

The FAM builds a computerized reporting system—working off a relational database—that can separate costs by functions (e.g., instruction, instructional support, operations, other commitments etc.), by location (Central, East, North), by individual school and school type (primary, secondary, tertiary etc.), by program (special education, grammar course, bilingual/ESL etc.). The cost by function can be further refined to include other sub-functions (e.g., face-to-face teaching and classroom materials etc.) and detailed functions. This sub-grouping permits FAM a greater level of specification in each function, going from a few basic functions to more detailed functions. This is a school site data model that traces funds from their sources to the classroom and student. In its final form, the software integrates a rational database with a managerial reporting system that allows districts, cluster (or group) to account for resources in each school.

The Comparison of Per Student Expenditure by Schools is shown in Table 7.2 on the next page.
Table 7.2 The Comparison of Per Student Expenditure by Schools

<table>
<thead>
<tr>
<th></th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>Average Central District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instruction (Face to Face Teaching)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching staff salaries</td>
<td>1450</td>
<td>2000</td>
<td>1600</td>
<td>1683</td>
</tr>
<tr>
<td>Instructional Materials</td>
<td>20</td>
<td>25</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Class room supplies</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Other teaching staff cost</td>
<td>25</td>
<td>26</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>1505</td>
<td>2063</td>
<td>1667</td>
<td>1745</td>
</tr>
<tr>
<td><strong>Operational</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repairs &amp; Maintenance</td>
<td>250</td>
<td>230</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Energy/Water</td>
<td>233</td>
<td>280</td>
<td>260</td>
<td>258</td>
</tr>
<tr>
<td>Rent &amp; Rate</td>
<td>40</td>
<td>20</td>
<td>50</td>
<td>37</td>
</tr>
<tr>
<td>Maintenance &amp; Supplies</td>
<td>27</td>
<td>29</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Maintenance Staff Costs</td>
<td>70</td>
<td>80</td>
<td>68</td>
<td>73</td>
</tr>
<tr>
<td>Other maintenance staff cost</td>
<td>15</td>
<td>20</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Transport Cost</td>
<td>20</td>
<td>23</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>655</td>
<td>682</td>
<td>697</td>
<td>678</td>
</tr>
<tr>
<td><strong>Other Commitments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingencies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Capital (equipment ,books etc)</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>38</td>
</tr>
<tr>
<td>Out of district obligation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legal obligation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>38</td>
</tr>
<tr>
<td><strong>Leadership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Management</td>
<td>750</td>
<td>730</td>
<td>800</td>
<td>780</td>
</tr>
<tr>
<td>Admin. &amp; clerical salaries</td>
<td>15</td>
<td>14</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Other staff cost (admin &amp; clerical)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Program Management</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>District Management (Publicity &amp; fund management)</td>
<td>20</td>
<td>30</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>785</td>
<td>774</td>
<td>854</td>
<td>804</td>
</tr>
<tr>
<td>Total</td>
<td>2970</td>
<td>3559</td>
<td>3268</td>
<td>3266</td>
</tr>
</tbody>
</table>

For comparison of expenditure by district and all Singapore schools, please refer to Table 7.3
<table>
<thead>
<tr>
<th>Instruction (Face to face Teaching)</th>
<th>Central District</th>
<th>Average Central District</th>
<th>Average East District</th>
<th>Average North District</th>
<th>Average Singapore schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>School B</td>
<td>School C</td>
<td>School A</td>
<td>School B</td>
<td>School C</td>
</tr>
<tr>
<td>Teaching staff salaries</td>
<td>1450</td>
<td>2000</td>
<td>1600</td>
<td>1,683</td>
<td>1,540</td>
</tr>
<tr>
<td>Instructional materials</td>
<td>20</td>
<td>25</td>
<td>19</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Classroom supplies</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Other teaching staff cost</td>
<td>25</td>
<td>26</td>
<td>28</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>Operational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repairs &amp; Maintenance</td>
<td>250</td>
<td>230</td>
<td>240</td>
<td>240</td>
<td>237</td>
</tr>
<tr>
<td>Energy/water</td>
<td>232.5</td>
<td>280</td>
<td>260</td>
<td>258</td>
<td>250</td>
</tr>
<tr>
<td>Rent &amp; rates</td>
<td>40</td>
<td>20</td>
<td>50</td>
<td>37</td>
<td>45</td>
</tr>
<tr>
<td>Maintenance supplies</td>
<td>27.5</td>
<td>29</td>
<td>30</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>Maintenance staff cost</td>
<td>70</td>
<td>80</td>
<td>68</td>
<td>73</td>
<td>50</td>
</tr>
<tr>
<td>Other maintenance staff cost</td>
<td>15</td>
<td>20</td>
<td>21</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Transport Cost</td>
<td>20</td>
<td>23</td>
<td>28</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Other Commitments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contingencies</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Capital (equipment, books etc)</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Out of District Obligation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legal obligation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School management:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admin &amp; clerical salaries</td>
<td>750</td>
<td>730</td>
<td>800</td>
<td>760</td>
<td>800</td>
</tr>
<tr>
<td>Other staff cost (admin &amp; clerical)</td>
<td>15</td>
<td>14</td>
<td>19</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Program management</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>District Management:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Publicity &amp; fund raising)</td>
<td>20</td>
<td>30</td>
<td>35</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>Total Expenditure per student</td>
<td>2970</td>
<td>3,559</td>
<td>3,268</td>
<td>3,266</td>
<td>3,130</td>
</tr>
</tbody>
</table>

The ideal Finance model should not only fulfil its financial audit requirement, it should provide better information on school costs and efficiency especially those targeted at improving student performance. To implement this reporting system, we require thorough examination of the following processes: (1) Re-think the basis on which information is configured and used i.e. activity based costing. (2) Re-tool the models and technologies for gathering, analysing and managing such information i.e. computer software for financial model. (3) Re-evaluate school-specific information and its use in planning and decision-making. The FAM data can help to determine individual school
equity, efficiency and productivity. Besides financial information, it should also be used in combination with test scores, attendance rate, teacher qualities and other non-financial information.

The implementation of the Finance Model

For implementation of standard costing system and financial analysis model: the central body should implement the standard costing system and FAM. (e.g. Finance Division, Ministry of Education). In the initial stage, standard costing system and FAM may be set up at school site level or cluster level with the ultimate objective to link and integrate to all schools in Singapore.

Budget Handbook and Handbook on Accounting Techniques

For more effective use of budgeting, besides training, a budget handbook (Appendix 5) with guidelines and examples on budget would be given to principals. Appendix 6 and 7 are examples of budget format and budgetary control. In addition, a handbook of Accounting techniques (Appendix 5) should also be distributed to principals for their guidance and reference. Those commonly used techniques such as unit cost, variance analysis and the other management accounting techniques should be illustrated and explained. This is to ensure sufficient training and guidance is given to principals and administrators.

Training for the administrator

The study shows that most of the administrators want to have training on management accounting. Yet the application of marginal costing, breakeven analysis, discounted cash flow, return of capital and activity based costing is rather low except at the tertiary institutions. This indicates that training for management accounting is imperative.

The study also showed that there were adverse comments on management accounting. This type of attitude was reflected in one of interviewee’s comment “The job concerning accounting and costing should be left to the school administrative officer, the
school principal will deal with professional matters". This resembles the view of many writers: Levacic (1989) claimed that financial management intrudes on the head's role as an educational leader and this will result in educational decisions being extensively dominated by financial considerations. Davis (1994) claimed that the most important strategic understanding to develop is that educational institutions should be education-driven not resource-driven. Kogan (1986) criticised the market mechanism as likely to be damaging to teachers' professionalism. Therefore, proper management accounting training for the administrators and the appointment of professional bursar may minimize any potential pitfalls.

**Appointment of a Professional Bursar**

Harrold and Hough (1988, p.14) suggested that "the financial responsibilities (in schools) will be so time-consuming that it cannot be doubted that the appointment of a bursar with specialist accountancy qualifications and/or experience will be essential". The author supports the need for appointing a professional bursar to relieve principals and academic teachers from financial responsibility, so that they may focus on academic work. However, a better understanding of management accounting is important for all principals and administrators, so that school leaders can make better resource utilisation decisions, and are more amenable to system changes. Therefore, the researcher suggests that all school principals/administrators should receive training in these techniques.

**Overall Performance indicator-Balanced Scorecard for Schools**

In business, Kaplan and Norton's balanced scorecard appears to be have a particular threat to the old style of budgeting and controlling (Kaplan and Norton, 1993). The idea is that companies should plan and monitor not just bottom-line profit, but the overall progress of the company in a balanced way. The company should measure financial performance, but also customer satisfaction, innovation and learning, and key performance indicators (KPIs) such as cycle time, yield etc. The company can get a favourable score when doing well on both short-term performance and indicators of future success. In educational institutions and schools, they should not measure only the student's performance in examinations (ranking in PSLE, O level and A Level),
competition in athletic events and games. Other examples of key performance indicators (KPIs) are unit cost per student, unit cost per class, unit cost per program, teacher/student ratio, number of drop out students, student added value, student intake at lower PSLE score converted to a higher “O” level performance), student and parent’s satisfaction, community services etc. These will help school administrators to understand how the school performance fits in with overall strategy and success. This also facilitates a more equitable approach in comparison with other schools. This is in line with the government policy on school appraisal. The school shall adopt a quality assurance approach to school appraisal. Schools will assess themselves on their approach (how outcomes will be achieved), deployment (extent to which approach is applied) and results (degree of achievement of outcomes). Schools which achieve excellence will be appropriately recognized.

At present, there is no indicator which provides overall performance measurement. This makes comparison between institutions difficult. The researcher suggested that a balanced scorecard system could be used for measuring school performance. This is illustrated below:

Balanced Scorecard for School A

Table 7.4-Balanced Scorecard for School A

**Ranking: 1 to 5 (1 is the lowest and 5 is the highest)**

<table>
<thead>
<tr>
<th>Students’ Perspective</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement focus on:</td>
<td></td>
</tr>
<tr>
<td>Quality of the Courses</td>
<td>4</td>
</tr>
<tr>
<td>Score rate for examinations</td>
<td>4</td>
</tr>
<tr>
<td>Score rate for sports</td>
<td>3</td>
</tr>
<tr>
<td>Extra-circular activities performance</td>
<td>2</td>
</tr>
<tr>
<td>Score on community services</td>
<td>3</td>
</tr>
</tbody>
</table>

| Total | 16 |

<table>
<thead>
<tr>
<th>Process Capabilities:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement focus on:</td>
<td></td>
</tr>
<tr>
<td>School Building</td>
<td>2</td>
</tr>
</tbody>
</table>

School Facilities: Computer room, Library | 2 |
Innovation and learning perspective:

<table>
<thead>
<tr>
<th>Measurement focus on:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Leadership e.g. New Language</td>
<td>4</td>
</tr>
<tr>
<td>Teaching method</td>
<td></td>
</tr>
<tr>
<td>New course place on internet</td>
<td>3</td>
</tr>
<tr>
<td>Responsiveness to change of technology to students' need</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
</tr>
</tbody>
</table>

Financial Perspective:

<table>
<thead>
<tr>
<th>Measurement focus on:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flow</td>
<td>3</td>
</tr>
<tr>
<td>Funding</td>
<td>3</td>
</tr>
<tr>
<td>Growth in income</td>
<td>2</td>
</tr>
<tr>
<td>Market Share</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

Comparison of overall ranking between Schools

Table 7.5 Balanced Scorecards for Schools

<table>
<thead>
<tr>
<th>Items</th>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
<th>School E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students' Perspective</td>
<td>16</td>
<td>18</td>
<td>14</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Process Capacities</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Innovation and Learning Perspective</td>
<td>9</td>
<td>12</td>
<td>10</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Financial Perspective</td>
<td>10</td>
<td>15</td>
<td>16</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>51</td>
<td>43</td>
<td>50</td>
<td>57</td>
</tr>
</tbody>
</table>

The score evaluation is done by the administrator of the school annually and is placed on the central database for school administrators for comparison and assessment of their school performance.

Table 7.5 shows that School A has the lowest score and School E has the highest score.
The significance and limitations of this research

As this is one of the first studies of its kind in Singapore, the study confirms our presumption that management accounting techniques are, to a large extent, used as management tools in Singapore schools/institutions. The study also shows that the use of management accounting techniques is extensive in Singapore educational institutions. However, the study also confirms that Singapore educational institutions still have not adopted the management accounting system in full. Therefore it identified the inadequacies of the present system and the limitations of the technique. The study also confirms that most of the principals/administrators would like to have training in these techniques. This confirmation is important in deciding whether to introduce a management accounting system formally in schools and training on this area should be provided formally to the principals/administrators. The scope of this study is rather broad based, and covers only the most common techniques such as budgeting, unit cost, variance and ratio analysis, cost centre, profit centre, accounting information etc. But the study does not probe the use of each technique in detail. Therefore this study gives future researchers many new frontiers of inquiry. It is hoped that other researchers may study more specific areas such as the human side of budgeting, standard costing, costing and pricing systems and implementation of activity based costing in schools.

Accounting information is normally considered confidential, so that generally principals are not willing to provide sensitive information without obtaining approval from higher authority. On the other hand, the research activities cannot be too laborious and time-consuming; this may discourage participants from participating in the study. Most of the school respondents are from Government funded or government-aided schools, therefore they are not so keen on questions related to pricing and sales promotion. For commercial and private tuition schools and kindergartens, the response rate was very low. This could be due to their small structure and lack of formal accounting system. Protection of commercial secrets could also be a factor in deciding whether to participate in the study.

We should not forget the intrinsic limitations of management accounting. Much has been written about the demise of traditional management accounting and the
revolutionary attributes of activity-based costing. Traditional management accounting has been criticized on the grounds that it does not provide the type of information required in today’s highly competitive and global environment. They fail to report on issues such as quality, reliability, lead times, flexibility and customer satisfaction and tend to focus on cost while ignoring other important items such as marketing, managerial and strategic considerations. In schools, the management accounting system should be integrated with other information systems to overcome this shortcoming.

Management accounting is only one of the information systems. Administrators should use the integrated information system which should include other information such as student attendance, test scores, teacher qualifications, skills, classroom materials, and other program and education results (compared over time periods and across schools) for better decision making. For successful implementation, management should receive sufficient training.

Conclusion

The research focus is “Management accounting in Education: stakeholder perceptions in Singapore”. The research is focused on the extent of application of management accounting to the educational institutions in Singapore and the attitudes of the senior management of these institutions towards the effectiveness of management accounting as a management tool. The study shows that the use of management accounting techniques is extensive in Singapore educational institutions. However, the study also confirms that Singapore educational institutions still have not adopted the management accounting system in full. Therefore it identified the inadequacies of the present system and the limitations of the techniques. The study shows that there was a lower rate of usage in secondary schools, primary schools and other institutions (especially private commercial schools). This signifies that there is still a lack of management accounting systems in Singapore educational institutions, even though most of the principals and administrators are supportive of the use of management accounting. The study also shows that a majority of the administrators in the Singapore educational institutions thought that management accounting techniques were useful to their work
and more than half of them expressed their desire to receive training in the techniques. The supportive attitudes show that our administrators accept the challenges in the new millennium given by the Minister of Education that the school principal will be a leader of people, an entrepreneur and innovator. The use of management accounting techniques in Singapore educational institutions is quite extensive in that all the techniques mentioned in my questionnaires are used. Budgeting is the most extensively use technique. Among different types of institutions, the extent of usage and type of techniques applied may vary. It seems that tertiary institutions applied more management accounting techniques than other institutions. The more advanced techniques: Activity-based Costing (ABC), overhead allocation etc. are commonly used in tertiary institutions, which mirrors the trends in United Kingdom and United States. On the other hand, a small number of administrators are non-supportive of these techniques. Accounting is a non-professional matter and hard to understand, schools are not-for-profit institutions constitute some of the reasons for them to object to the techniques.

The study shows that for more effective use of the techniques, training and guidance is important. The school administrator may not be expert but the training at least makes them appreciate its usefulness and they may then be more supportive to changes required. As the financial responsibilities in schools are so time consuming, the appointment of a professional bursar may assist them in this chore, so that they can concentrate on professional matters. It is proposed that a Budget handbook and handbook on the various techniques should serve as a source of reference and also ensure uniformity of the implementation of the budgetary system.

The study shows that most of the institution administrators had not received any formal training in management and financial management. Most of them learned on the job. To avoid errors and improve efficiency, it is proposed that management accounting techniques should be included as one of the subjects in the institution administrator's course or teacher training course.

An ideal Model of finance in Singapore Education is proposed. This model will be focused on three aspects: Effective costing and Pricing system set up at school site
level; Standard Costing system: and Financial Analysis Model. The effective costing and pricing system embraces all costing and pricing activities. The Standard costing system will be implemented by the central body to assist schools in budgeting, purchasing and evaluating performance. The Financial Analysis Model provides a relational database for decision-making information in the school site as well as in the district and cluster (or group). For self-appraisal or comparison of performance with other schools, it is proposed that some overall indicator similar to balanced scorecard applicable to the business organisation could be used for measuring school overall performance. The author also suggests that in schools, the management accounting system should also be integrated with other information system to overcome the limitation of management accounting.

This study is one of the first studies of its kind in Singapore. The study confirms our presumption that management accounting techniques are to a fairly large extent applicable to Singapore educational institutions. Most of the administrators regard these techniques as a useful management tool.

The author hopes that the findings will give the future researcher a new frontier of inquiry. He also hopes that through the implementation of the Finance Model, the management accounting techniques will help educational administrators to improve the quality and productivity of the institution, and to use limited resources effectively. This will be beneficial to all the stakeholders. The author also hopes that this study will arouse the interest of accounting professionals, and encourage them to explore areas, which they have not paid much attention to in the past.
References
References


Davis. (1988). These steps to lift off local financial management. In Education 1988 August. (P.p. 131-132)


Kaplan and Norton. (1993). The balanced scoreboard-measures that drive Performance, Quality and Productivity Management 10 (pp.43-54)


Singapore 1998, Ministry of Information and the Arts


Toe Chee Hean, Minister for Education (1999), Principals: Leaders, Entrepreneurs and Innovators for the New Millennium. Strait Times 1999


Appendices
# Questionnaires for Pilot Sample

## Accounting as a Management Tool Survey

Please complete this questionnaire by placing a tick ✓ in the appropriate box or writing your answer in the space provided.

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**Remarks**

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<td>5.7 Unit cost is useful in setting targets and monitoring performance.</td>
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6. Have you ever made use of ratio analysis:
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   6.3 To compare the accounting statistics of one unit with those of another unit.
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Remarks

7. Have you ever made use of the following management accounting techniques to
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Remarks

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8. Are you (Pick one)
   Male ?
   Female ?

9. In which of following groups does your age fall?
   (pick one)
   Under 30
   31 - 40
   41- 50
   50- 60
   Above 60

10. Which of the following best describes your title or main occupation?
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    Primary
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    Commercial
    Technical
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13. Which of the following best describes the number of students your
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    (Pick one)
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14. Please indicate whether you are available for a face-to-face interview:
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Page 2
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Remarks

8. Overall (Pick One) Yes No
8.1 Management accounting techniques is useful for my work.
8.2 I like to have training for management accounting techniques.

9. Are you Male? Female?

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10. In which of following groups does your age fall?
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10.2 31-40
10.3 41-50
10.4 50-60
10.5 Above 60

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11. Which of the following best describes your title or main occupation?

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14. Which of the following best describes the number of students your institute/school has trained per annum?

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<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Page 2
Appendix 3.3

Draft interview Schedule

Mr Principal, thank you for your assistance in answering my questionnaire and your acceptance of our appointment for this interview to find out more details on the application of management accounting to your institution/school.

Q. Have you ever make use of accounting information for decision making in your daily operation?

Q. In which areas of operation is the above information useful?

Q. What kind of performance indicators do you use to assess the performance of a unit/division of your institutions?

Q. Do you find profit centre useful to evaluate the performance of a division?

Q. How do you decide whether to buy or lease office equipment of over S$10,000?

Q. How do you plan for your cash flow requirement?

Q. How do you find cash flow budgeting or projection is useful for your daily operation?

Q. How do you find budgeting is useful for your daily operation?

Q. When your actual expenditure is higher than budgeted expenditure, do you try to find out the explanation?

Q. How do you use unit cost or unit tuition fees to assist you to decide whether to start a new class?

Q. Have you ever make use of ratio analysis to compare one expenditure item with another item?

Q. Do you think that radio analysis is useful for your daily operation?

Q. Do you think that standard costing is useful for your work?

Q. Do you think that marginal costing is useful for your work?

Q. Have you ever make use of breakeven point to decide whether to start a class or a Programme?

Q. Do you think that return of capital is useful for evaluating your investment?
Q. Do you think that Activity Based Costing is useful to monitor the resources of your institution?

Q. How do you evaluate the performance of a division in relation to another division of your institution?
Appendix 4.

List of Interviewees

<table>
<thead>
<tr>
<th>Interview No.</th>
<th>Interviewee</th>
<th>Place / Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A, Principal, Fuchun Secondary School</td>
<td>Fuchun Secondary School/Nov 1999</td>
</tr>
<tr>
<td>2</td>
<td>B, Principal, Opera Estate Primary</td>
<td>Outside School/Nov 1999</td>
</tr>
<tr>
<td>4</td>
<td>D, Principal, Si Ling Secondary School</td>
<td>Outside School/ Dec 1999</td>
</tr>
<tr>
<td>5</td>
<td>E, Principal, St Francis Methodist School</td>
<td>St. Francis Methodist School/Dec 1999</td>
</tr>
<tr>
<td>6</td>
<td>F, School Administrator, Commercial School</td>
<td>Outside School/Dec 1999</td>
</tr>
</tbody>
</table>
Handbook on Budget and Accounting Techniques

The handbook of accounting techniques will explain those management accounting techniques commonly used in institutes and schools. This should be distributed to principals and administrators. The followings are samples for some of the techniques, more illustration will be provided for the actual handbook:

Accounting information

Accounting information, along with other information, is summarized, analysed, and reported to those who are responsible for knowing what is happening in the organisation and for improving performance. These reports essentially compare planned outputs with actual output and input. They are used for three purposes: (1) as a basis for coordinating, controlling the current activities of the organisations. (2) as a basis of evaluating operating performance of an organisation. (3) as a basis for program evaluation. In educational in institute, accounting information is required for control of expenditure, planning cash flow requirement, evaluate performance and making decisions

Budgeting

The budget is a tool for planning the activities that lead to the achievement of educational objectives. It provides an opportunity to express the aims and curriculum of the school or college in financial terms. A good budget-setting process will seek to align financial considerations with the priorities outlined in a school’s strategy plan. In practice, a budget provides: (1) a realistic estimate of income and costs for a stipulated period and of the financial position at its close; (2) a coordinated plan of action designed to achieve the estimates reflected in the budgets; (3) a comparison of actual results with those budgeted and an analysis and interpretation of deviations by areas of responsibility to indicate courses of corrective action and to lead to improvement in procedures in building future budgets; (4) a guide for management decisions in adjusting plans and objectives as
uncontrollable conditions changes; (5) a ready basis for making forecasts during the budget period to guide management in making day-to-day decisions; (6) a way for encouraging the consideration of profit-planning, which requires the establishment of objectives.

Variance Analysis
The difference between budgeted and actual performance is termed "variance". Variance is the difference between a planned, budgeted or standard cost and the actual cost incurred. The same comparisons may be made for revenue. The generation of variances provides the feedback that entitles us to term the whole process a control system. Variance accounting is a method of accounting by means of which planned activities (quantified through budgets and standard costs and revenues) are compared with actual results which provides information for variance analysis. This is evaluation of performance by means of variances, whose timely reporting should the opportunity for managerial action. Variance analysis relates to the technique of "Management by exception" where management information is only really required on areas where the plan is not being achieved. Variance analysis is a skill of interpretation.

Standard Costing
Standard costs are carefully predetermined cost; they are target costs; costs that should be attained under efficient operations. Standard costs provide a framework for gauging performance, for building useful budgets, for guiding pricing, for meaningful product costing. Cost control depends on a set of standards as a frame of reference that outlines how a task should be accomplished and how much it should cost. As work is done, actual costs incurred are compared with standard costs to reveal variances. The variances are investigated to discover reasons, through this, the appropriate action can be taken by management. The standard cost may be determined on a number of bases. The main uses of standard cost are in performance measurement, control, stock valuation and in establishment of selling prices. Standard costing allocates costs. The use of standard costing would promote horizontal equity by helping to ensure that like pupils have similar amounts of resources allocated to them. If standard-cost estimates can adequately
reflect unavoidable difference (i.e. those not due to inefficiency) in institution-specific costs and can encompass differences in student-related costs due to special needs, then vertical equity can be promoted as well. Standard costing systems are widely used because they provide cost information for many purpose such as: prediction of future cost, setting of challenging target, a device for budgeting and control.

Unit Cost (average cost)

For education, average costs are often called unit costs and are the cost of providing for each student. Unit cost = total cost /number of unit. Average cost are made up of both fixed and variable cost so even when more variable costs are being incurred, average costs will continue to fall until it is necessary to pay more fixed costs. For example the falling average cost will continue until the optimum point is reached and then, if a second set of equipment is needed, additional fixed costs will be incurred and average costs will increase. Unit costs are valuable and often essential for cost comparison, across years or between schools. These will usually be costs of inputs, normally under budget heads like teacher salaries, electricity etc. A unit cost is sometimes prefered as a measure of resource impact, cost per student, per student-hour or cost per class are useful ways of studying educational activities. Their principal value is that they are a limited link between inputs and output taking into account the economy of scale. This can be used for relative comparison between alternative ways of carrying out an activity. The operational aim of management is to minimise the unit cost.

Costing

Costing, the process by which an organisation's costs are determined, is a useful strategic planning and management tool available to educational institutions. The rationale for doing costing is that (1) more information on decision-making will occur when administrators understand the origin of cost incurred by their organisation; (2) have information relevant to operational efficiency, evaluating comparative performance, and deciding among various resource allocation and reallocation strategies and (3) understand how to make optimal use of various sources available for funding their organisation.
Breakeven
Breakeven point is the level of activity at which where total revenues and total expenses are equal, there is neither profit nor loss. It can be ascertained by using the breakeven chart or calculation. Schools may use breakeven point technique to improve the acceptability of fees. This may make a higher level possible, using devices such as “extra charges”. The model allows the break-even class size to be compared with the average class size, if the average class size is greater, a surplus is generated.

Marginal Cost
The marginal cost is the cost of taking one extra student or reducing a group by one student. This is a significant costing factor and relates closely to the concept of threshold level of expenditure. This is a useful concept, if there is room in a class, the marginal cost might be relatively low and certainly well below the marginal revenue receivable for that student. However, if a new class has to be created, the marginal cost will certainly exceed marginal revenue and may lead to a decision not to admit the extra student.

Cost Apportionment

The cost apportionment process re-allocates the budgeted cost of each support centre between the academic cost centres using pre-determined apportionment rates. The choice of a base for establishing an apportionment rate is arbitrary. The apportionment base should be selected by choosing a resource relationship between support and academic centre which most closely reflected the linkage between the two. In other words how does the activity level of an academic centre change the activity level of the support centre, for example, enrolled students to library usage. The term cost driver can be used to describe this relationship. Identification and selection of the most appropriate cost driver is crucial for accurate unit costing. Generally, absorption rates and unit costs are recalculated each financial year although some colleges have adopted the practice of establishing absorption rates that apply for a number of financial years subject only to an
annual cost inflation adjustment. The following are some of the common cost apportionment methods:

(1) Administration cost is apportioned by
   (a) FTE (full time equivalent) staff to department
   (b) FTE students to course
   (c) Department direct cost
   (d) Top slicing (a percentage deduction is made from the income of each academic department to cover some or all of central costs.

(2) Premises cost is apportioned by
   (a) Space occupied to department
   (b) Room hourly rate to course

(3) Library cost is apportioned by
   (a) FTE staff to department
   (b) FTE students to course.
   (c) Staff/student weighed. This is a combined rate useful where there are two or more distinct cost drivers for a support department.
   (d) Actual user profile
   (e) Weighted student method. This is to improve the accuracy of support centre apportionment by seeking to reflect the different usage patterns of different students groups.

(4) Computing cost is apportioned by
   (a) FTE staff to department
   (b) FTE students to course
   (c) Staff/student weighted
   (d) Actual user profile
   (e) Weighted students.

It should be noted that total apportioned costs are necessary for unit costing. For the purpose of management control, only those costs which are directly controllable by responsibility managers. This should form a part of the control system. Therefore the
financial control reports to academic centre managers should focus on actual direct and controllable costs, not on apportioned and non-controllable costs.

**Activity based costing**

Activity based costing (ABC) has in recent years made inroads into services industries, and lately into public sector organisations, including education. The goal in ABC has broadly been to seek ‘true’ long-term cost of products or services. Activity-based costing is a cost accounting method that measures the cost of resources, processes, and overheads associated with a prescribed activity. Activities are the pieces of the operational whole, the steps necessary to produce an end product or services. ABC begins by defining a school in terms of its vital part or key activities. In ABC, it is necessary to identify the cost driver. The term “cost driver” applies to any factor which causes a change in the cost of activity, e.g. the quality of a course required, may affects the resources required An activity may have multiple cost drivers associated with it. These are activities that convert inputs (resources, materials, people, and technology). ABC seeks to link indirect costs, such as support centre costs to the cost unit, through the use of activity relationship. ABC can apply total quality in higher education, there is significant potential for using the data generated by ABC system in assessing the productivity and costs of various activities on campus and for deciding on strategic changes.
### Income Budget:
(Projected number of students trained: 2000)

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student tuition fees</td>
<td>3,800,000</td>
<td>1900</td>
<td>63.42%</td>
</tr>
<tr>
<td>Funding from Authority</td>
<td>2,000,000</td>
<td>1000</td>
<td>33.38%</td>
</tr>
<tr>
<td>Premises lettings/rents</td>
<td>90,000</td>
<td>45</td>
<td>1.50%</td>
</tr>
<tr>
<td>Consultancy Fees</td>
<td>72,000</td>
<td>36</td>
<td>1.20%</td>
</tr>
<tr>
<td>Bank interest &amp; Investment income</td>
<td>20,000</td>
<td>10</td>
<td>0.33%</td>
</tr>
<tr>
<td>Other miscellaneous income</td>
<td>10,000</td>
<td>5</td>
<td>0.17%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,992,000</strong></td>
<td><strong>2996</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

### Expenditure Budget:

#### Direct Cost

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching staff salaries</td>
<td>2,900,000</td>
<td>1450</td>
<td>48.82%</td>
</tr>
<tr>
<td>Administrative &amp; Clerical salaries</td>
<td>1,500,000</td>
<td>750</td>
<td>25.25%</td>
</tr>
<tr>
<td>Other staff cost (welfare, recruitment etc)</td>
<td>80,000</td>
<td>40</td>
<td>1.35%</td>
</tr>
<tr>
<td>Instructional materials</td>
<td>40,000</td>
<td>20</td>
<td>0.67%</td>
</tr>
<tr>
<td>Class room supplies</td>
<td>20,000</td>
<td>10</td>
<td>0.34%</td>
</tr>
<tr>
<td><strong>Total Direct Cost</strong></td>
<td><strong>4,540,000</strong></td>
<td><strong>2270</strong></td>
<td><strong>22.07%</strong></td>
</tr>
</tbody>
</table>

#### Overheads

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repairs &amp; maintenance</td>
<td>500,000</td>
<td>250</td>
<td>8.42%</td>
</tr>
<tr>
<td>Energy/water</td>
<td>465,000</td>
<td>232.5</td>
<td>7.83%</td>
</tr>
<tr>
<td>Rent &amp; rates</td>
<td>80,000</td>
<td>40</td>
<td>1.35%</td>
</tr>
<tr>
<td>Maintenance supplies</td>
<td>55,000</td>
<td>27.5</td>
<td>0.93%</td>
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<tr>
<td>Property and maintenance staff salaries</td>
<td>140,000</td>
<td>70</td>
<td>2.36%</td>
</tr>
<tr>
<td>Other staff cost (welfare, recruitment etc)</td>
<td>30,000</td>
<td>15</td>
<td>0.51%</td>
</tr>
<tr>
<td><strong>Total Overheads</strong></td>
<td><strong>1,270,000</strong></td>
<td><strong>635</strong></td>
<td><strong>21.38%</strong></td>
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</table>

#### Other expenses

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>40,000</td>
<td>20</td>
<td>0.67%</td>
</tr>
<tr>
<td>Goods (books etc)</td>
<td>50,000</td>
<td>25</td>
<td>0.84%</td>
</tr>
<tr>
<td>Publicity &amp; Fund raising</td>
<td>40,000</td>
<td>20</td>
<td>0.67%</td>
</tr>
<tr>
<td><strong>Total Other expenses</strong></td>
<td><strong>130,000</strong></td>
<td><strong>65</strong></td>
<td><strong>2.19%</strong></td>
</tr>
</tbody>
</table>

**Total Expenditure budget**

<table>
<thead>
<tr>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,940,000</td>
<td>2970</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**Budget surplus**

<table>
<thead>
<tr>
<th>Amount (S$)</th>
<th>Per Student (S$)</th>
<th>% of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>52,000</td>
<td>26</td>
<td>1.15%</td>
</tr>
</tbody>
</table>
Table 7.5 Budgetary Control

The income and Expenditure report for June 2002

**Income Budget:**
(Projected number of students trained: 2000)

<table>
<thead>
<tr>
<th></th>
<th>Jan/Jul Budget</th>
<th>Jan/Jul Actual</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S$</td>
<td>S$</td>
<td>S$</td>
</tr>
<tr>
<td>Student tuition fees</td>
<td>3,800,000</td>
<td>1,900,000</td>
<td>1,945,000</td>
</tr>
<tr>
<td>Funding from Authority</td>
<td>2,000,000</td>
<td>1,000,000</td>
<td>1,000,200</td>
</tr>
<tr>
<td>Premises lettings/rents</td>
<td>90,000</td>
<td>45,000</td>
<td>44,000</td>
</tr>
<tr>
<td>Consultancy Fees</td>
<td>72,000</td>
<td>36,000</td>
<td>22,000</td>
</tr>
<tr>
<td>Bank interest &amp; Investment income</td>
<td>20,000</td>
<td>10,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Other miscellaneous income</td>
<td>10,000</td>
<td>5,000</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td><strong>5,992,000</strong></td>
<td><strong>2,996,000</strong></td>
<td><strong>3,022,200</strong></td>
</tr>
</tbody>
</table>

**Expenditure Budget:**

**Direct Cost**

**Staff Cost:**

- Teaching staff salaries: 2900000 1450000 1570000 (120,000)
- Administrative & Clerical salaries: 1500000 750000 780000 (30,000)
- Other staff cost (welfare, recruitment etc): 80000 40000 34000 6000
- Instructional materials: 40000 20000 19000 1000
- Class room supplies: 20000 10000 7000 3000
- **Total Direct Cost:** 4540000 2270000 2410000 (140,000)

**Overheads**

**Premises cost:**

- Repairs & maintenance: 500000 250000 268,000 (18,000)
- Energy/water: 465000 232500 245,600 (13,100)
- Rent & rates: 80000 40000 35,000 5,000
- Maintenance supplies: 55000 27500 30,000 (2,500)
- Property and maintenance staff salaries: 140000 70000 58,000 12,000
- Other staff cost (welfare, recruitment etc): 30000 15000 20,000 (5,000)
- **Total Overheads:** 1270000 635000 656,600 (21,600)

**Other expenses**

- Transport: 40,000 20,000 18,000 2,000
- Goods (books etc): 50,000 25,000 17,000 8,000
- Publicity & Fund raising: 40,000 20,000 18,000 2,000
- **Total Other expenses:** 130,000 65,000 53,000 12,000

**Total Expenditure budget:** 5,940,000 2,970,000 3119600 (149,600)

**Budget surplus:** 52,000 26,000 (97,400) 175,800