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THE DELPHI TECHNIQUE: A CASE STUDY OF  
ITS APPLICATION IN SCHOOL ADMINISTRATION

A thesis presented in partial fulfilment  
of the requirements for the Degree  
of Master of Arts at  
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1985

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## A B S T R A C T

The objectives of this study were:

- 1) To ascertain the challenges facing school administrators during the remainder of this decade, using the Delphi Technique.
- 2) To evaluate the potential of the Delphi Technique for school administrators.

To fulfil these objectives a small sample of school administrators (N=33) completed a three-round Delphi procedure. In the first round, participants were invited to respond to the question: "What are the challenges facing school administrators during the remainder of this decade?" A total of 136 statements were received and, after screening and editing, these were refined to a list of 34 items. For Round Two, respondents had their own Round One responses and the summary list of 34 items returned, and they were asked to reconsider the question about the future challenges facing school administrators, in the light of their previous reply and the group summary. A list of 42 statements, 33 of which appeared in the second round, was derived as a result of Round Two. In the final round, respondents were fed back the list of 42 statements and were asked to indicate the importance of each. A statistical analysis of data derived from Round Three indicated 'Staffing Practices and Issues' items were the most prominent amongst challenges facing school administrators during the remainder of this decade, with the most important issue being to 'improve staff professional competency and development through training, closer supervision and collegial support'.

A Follow-Up Evaluation of this three-round Delphi project was carried out to obtain information relevant to the second objective outlined above. The sample of school administrators was sent a questionnaire which, *inter alia*, sought their opinions on: the degree to which they concurred with the outcomes from Round Three; difficulties they encountered during the project; and advantages and disadvantages of Delphi. The tenor of the respondents' comments in this Follow-Up Evaluation indicated general support for the Delphi Technique as a potentially viable tool for school administrators.

And, finally, after considering the significant methodological issues that arose during the course of this study (e.g. the selection of the sample; the editing process) it was concluded that school administrators may find a number of advantages in using the Delphi Technique, particularly in areas such as curriculum planning, developing goals and objectives, and arriving at consensus and budgeting allocations.

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## TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	i
ACKNOWLEDGEMENTS .....	ii
TABLE OF CONTENTS .....	iii
LIST OF TABLES AND FIGURES .....	iv
INTRODUCTION .....	1
<u>CHAPTER ONE</u> The Delphi Technique .....	3
<u>CHAPTER TWO</u> Research Design .....	24
<u>CHAPTER THREE</u> Results and Discussion .....	42
<u>CHAPTER FOUR</u> The Potential of the Delphi Technique .....	57
<u>CONCLUSION</u> .....	75
APPENDIX A .....	77
APPENDIX B .....	79
APPENDIX C .....	82
APPENDIX D .....	86
APPENDIX E .....	91
APPENDIX F .....	95
APPENDIX G .....	97
APPENDIX H .....	100
BIBLIOGRAPHY .....	103

## LIST OF TABLES AND FIGURES

<u>Table</u>	<u>TABLES</u>	<u>Page</u>
1	A Summary Of The Estimated Number Of Bombs Required To Reduce The U.S. Munition Output	7
2	Delphi Studies In Education	18
3	The Sample	29
4	Coefficient Of Variation As A Stopping Criterion	38
5	Calculation Of The Coefficient Of Variation (V) From Round Three Results	39
6	A Summary List Of The Respondents' Round One Comments	44
7	A Summary List Of The Respondents' Round Two Comments	47
8	The Six Categories Of Challenges From Round Two Results	50
9	The Frequency Of Mention For Round Two Results	51
10	Round Three Results With Mean And Standard Deviation And Categories	53
11	The 'Pros' And 'Cons' Of Delphi As Noted By The Panel	64
12	The Attrition Rates For The Sample	66

FIGURES

<u>Figure</u>		
1	A Flowchart Of The Typical Delphi Process	8
2	The Overall Framework Of The Study (1984)	27

## INTRODUCTION

The rapid political, social, economic and technological changes that are occurring in society have brought many problems which need urgent attention. Education has often been valued as a vital mechanism for solving some of these problems. Consequently, administrative decision-making in education is very important as it is often the key to effective education. However, this administrative decision-making is now reputed to be more difficult than ever before, partly as there are "more variables to consider and less leeway for error" (Podemski, 1982), but also because consensus is frequently difficult to obtain. It is in a situation such as this that the Delphi Technique is gaining prominence as a method for aiding decision-making by generating consensus.

The Delphi Technique was developed in 1948 and, since then, it has been used for a variety of purposes where general consensus of opinion is necessary. Through Delphi, consensus is arrived at by subjecting a panel of respondents to a series of questionnaires interspersed with feedback. Respondents remain anonymous to each other, although they are given access to the views of their co-respondents through the feedback process employed with the Delphi Technique. Delphi is claimed to avoid many of the disadvantages common with round-table discussion and face-to-face interaction (e.g. 'bandwagoning'; influence of dominant individuals).

Most applications of Delphi in education have been concerned with the general field of educational planning. However, in this present study, attention is focused on the use of Delphi in school administration with the two-fold aim:

- 1) To ascertain the challenges facing school administrators during the remainder of this decade, using the Delphi Technique.
- 2) To evaluate the potential of the Delphi Technique for school administrators.

Accordingly, the report of this study is in four sections. Chapter One gives an overview of the Delphi Technique, including a general description of its history and development. The characteristics of the typical Delphi process are then elaborated, followed by a discussion of the advantages and disadvantages of the technique. Applications of Delphi, especially in education, are outlined, and the chapter concludes with a rationale for the present study.

The research design is outlined in Chapter Two. Here, the framework of the study is shown, followed by the description of sample selection, the Delphi procedure that was used, and the Follow-Up Evaluation.

Chapter Three presents the results obtained from each of the three rounds which are then analysed and discussed.

Chapter Four focuses on the results of follow-up evaluation and methodological issues concerning Delphi with a view to determine the potential of Delphi for school administrators.

CHAPTER ONE

THE DELPHI TECHNIQUE

## INTRODUCTION

This chapter focuses on a discussion of the Delphi Technique, and is in three sections. The first commences with a description of the technique, followed by a discussion of its history and development, its characteristics, and advantages and disadvantages of its use. The second section outlines variations of the technique and some of its applications. And the final part of this chapter details the rationale for the present study.

## GENERAL DESCRIPTION OF THE DELPHI TECHNIQUE

The Delphi Technique is a research tool which has been developed for forecasting, policy-planning, and decision-making. The technique works on the parallel principles of 'pooled opinions' (Dalkey, 1969, p.415), and the fact that "two heads are better than one" (McGaw et al., 1976, p.59). In essence it is a method of eliciting opinions or judgements on a particular issue or problem, from a group of individual experts, or informants, who remain anonymous to each other. The combined responses are subjected to a process of refinement, through the use of successive questionnaires and controlled opinion-  
-feedbacks, with the opportunity for the respondents to revise their earlier views. Although termination criteria for an investigation can vary, most Delphi studies are terminated when agreement or consensus of opinions has been reached.

The Delphi pioneers, Norman Dalkey and Olaf Helmer, claimed that the Delphi Technique, with its features of response anonymity and controlled feedback of information, has several advantages over the conventional uses of expert opinions, such as in round-table discussions and other face-to-face meetings (Dalkey and Helmer, 1963).

## THE HISTORY AND DEVELOPMENT OF DELPHI

The Delphi Technique was originally developed for forecasting and predicting tasks. The first known Delphi experiment was carried out by the RAND Corporation in California in 1948 when it was used to improve the prediction of horse-race outcomes. There were some defects in that experiment and the criticisms it received offset the promise it showed (Quade, 1967).

In the early 1950s the staff of the RAND Corporation explored the effectiveness of using group information for short-term predictions of technological events. They set the prediction time-span for less than one year so as to enable them to check the resulting accuracy and reliability. Moreover, predictions were limited to very specific and narrow events. This experiment resulted in some interesting conclusions, with the more important being that more accurate projection results could be obtained from combining individual responses. This quasi-Delphi experiment also demonstrated that preventions (e.g. keeping respondents anonymous) could be taken against dominant individuals influencing the opinions of a group.

The first significant and relatively large-scale use of the Delphi Technique took place in 1953. This work was a top secret defence scheme known as 'Project Delphi' and was undertaken when RAND was contracted to forecast the international military situation between the years 1966-2015. This defence project was pioneered by two strategic scientists, Dalkey and Helmer, who worked with the United States Air Force in conjunction with the RAND Corporation personnel. They applied a version of the Delphi Technique to elicit opinions from a group of Air Force atomic warfare experts who were to simulate

Soviet strategic planners in selecting key United States industrial targets and then estimate the number of atomic bombs required to destroy and reduce the munition productivity of these targets.

The original 'Project Delphi'<sup>(1)</sup> had a panel of seven experts: four economists; one physical-vulnerability specialist; one system analyst; and one electrical engineer. They were administered five rounds of intensive questionnaires accompanied by controlled feedback at approximately weekly intervals. The experts were told that while the experiment was in progress they were not to discuss the study. This was necessary to keep their identity anonymous and to avoid any face-to-face confrontation which might result in hasty or biased opinions (Dalkey and Helmer, 1963). Through the process of iterative questionnaires and controlled opinion feedback there was opportunity for the experts to review their previous judgements. The five successive sets of opinions and the corrected responses showed a convergence of opinions amongst the panel of strategic scientists. Table 1 shows a summary of the estimated number of bombs required to destroy and reduce the United States' munition outputs. The Table indicates that after five successive rounds of questionnaires the scientists' opinions gradually converged. The smallest estimates increased from 50 to 167, while the largest decreased from 5000 to 360. The median advanced slightly from 200 to 276.

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(1) A fuller description of 'Project Delphi' can be found in Dalkey and Helmer, "An Experimental Application To The Delphi Method To The Use of Experts". Management Science, Vol. 9, No. 458, pp.458-567, 1963.

Table 1: A Summary of the Estimated Number of Bombs Required to Reduce the U.S. Munition Output

Response	Estimated Number of Bombs		
	Small	Answer Medium	Largest
Initial	50	200	5000
Final	159	255	495
Corrected final	167	276	360

Source: N. Dalkey and O. Helmer, "An Experimental Application Of The Delphi Method To The Use Of Experts". Management Science, Vol. 9, No. 458, p.460, 1963.

Dalkey and Helmer believed that if 'Project Delphi' had continued with more rounds of questionnaires the median would have shown a downward trend and the ratio of the largest to smallest answer would have narrowed to two or less. In their critique of the experiment, however, they suggested:

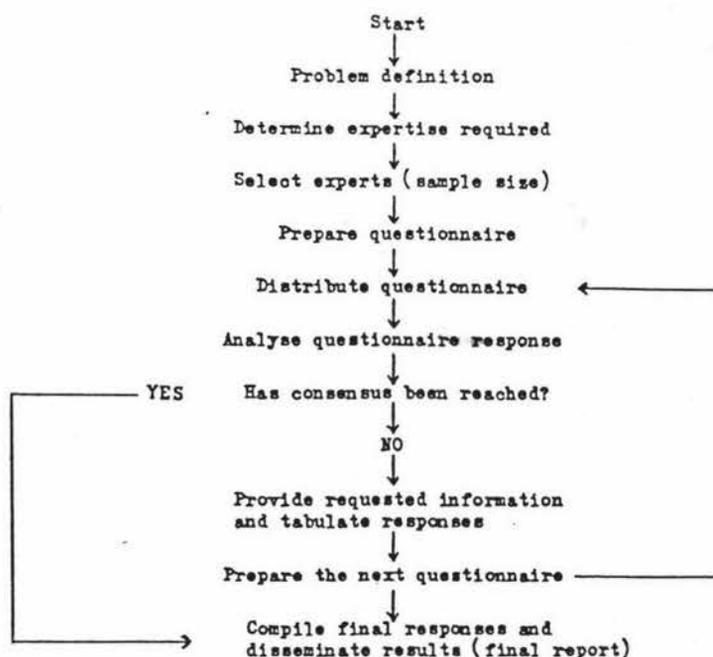
- a) the experts' responses were not strictly independent;
- b) one of the respondents was also used by the experimenters as a consultant on one aspect of the subject matter of the experiment; and
- c) some 'leading' by the experimenters inevitably resulted from the selection of the information supplied by the experts.

In the decade following 'Project Delphi' the RAND Corporation refined and published a number of papers on the Delphi Technique (see Quade, 1967). By the 1960s the technique had become a popular research tool which use had extended from various scientific and technological fields to diverse social, economic, and political endeavours. By this time, Delphi was being employed in short-term intermediate, as well as long-range, forecasting, policy-planning, and decision-making. The process of Delphi also underwent refinement, although the central characteristics of the technique remained unaltered.

## THE PROCESS AND CHARACTERISTICS OF THE DELPHI TECHNIQUE

In its application, the procedures of Delphi often vary. However, the flowchart (Figure 1) shows the typical Delphi process. This process begins with the assumption that to gather information for forecasting, policy-planning, or decision-making, the issue, or problem, must first be defined clearly. According to the requirements of the study, the expertise necessary to provide a solution to the problem is then ascertained. The experts are selected and the sample size is determined. Then a questionnaire is designed to elicit the opinions, or views, of the panel of experts. The questionnaire is then administered to them on an individual basis. When this questionnaire is returned, the responses are analysed and summarised. If a consensus has not been reached, a further questionnaire is prepared on the basis of the previous responses, analysis and summary. The new questionnaire, together with the analysis and summary, are then distributed to the respondents. This part of the Delphi process is repeated, as is shown in Figure 1, until a final or satisfactory consensus is reached.

Figure 1: A Flowchart Of The Typical Delphi Process



For most applications the Delphi Technique is characterised by three features:

- a) Response :  
Anonymity This is achieved by the use of questionnaires or other formal communication channels, such as on-line computer communication. The panel of experts, or respondents, is asked to make independent judgements in response to a particular issue under study. In most studies the participants are required to keep their identity anonymous. This provides a way of reducing the effect of dominant individuals.
- b) "Rounds" &:  
Controlled  
Feedback Until consensus has been reached, a sequence of "rounds", which are the iterations of the primary question, are administered to the panel. Generally, most studies find it sufficient to use three to four rounds to arrive at a satisfactory consensus. However, further rounds may be added according to the complexities of the issue under investigation and the clarification required. The general features of the different rounds are:

Round One : In this round a questionnaire is sent to each respondent. This questionnaire outlines the problem of the study and seeks the respondents' opinions and judgements in response to it. (For an example, see Appendix B.)

Round Two : The responses from the previous round are immediately screened and summarised. Here some editing of the responses may be involved. On the basis of the summary, a second questionnaire is drawn up. This questionnaire is sent to the panel members, together with the summary list and their Round One responses. In the light of this feedback, the respondents are asked to reconsider their previous opinions. Also, if there are participants whose opinions deviated from the majority judgement, they may be asked to supply a brief rationale for their previous answers and their new replies. (For an example, see Appendix C.)

Round Three: As before, the responses from Round Two are summarised and fed back to the respondents in a new questionnaire. Once again the experts are asked to reconsider their views. Those whose responses deviated from the norm may be asked to provide their justifications. A rating-scale may be employed in this round so that participants can indicate the 'importance' of an issue or the 'desirability' of the event if it occurs. (For an example, see Appendix D.)

Round Four : This round, or additional rounds, may be administered according to the complexities of the investigation and the clarification required. The procedures described above are applied to the subsequent rounds.

- c) Statistical: A statistical analysis in the form of median Group and standard deviation may be undertaken at the end of the second and/or subsequent rounds. Response The presentation of the statistical group response enables the respondents to ascertain quickly the group's consensus and to see how other panel members rank their opinions.

In summary, the Delphi Technique is characterised by the features of: response anonymity; "rounds" plus controlled feedback; and statistical group response. The next section of this chapter will discuss the advantages and disadvantages of Delphi.

#### ADVANTAGES AND DISADVANTAGES OF DELPHI

Dalkey and Helmer, the pioneers of the technique, claimed that the Delphi type of controlled interaction can avoid many of the disadvantages common to the more conventional round-table discussions and other forms of meeting. They argued that confrontations in these face-to-face encounters often lead people to formulate preconceived notions hastily, to close their minds to novel ideas, and to be swayed by persuasive opinions of others (Dalkey and Helmer, 1963).

In summary form, the advantages of Delphi can be listed as follows:

##### Advantages:

The Delphi Technique is claimed to have the following advantages:

- a) As Delphi is relatively nontechnical it is appropriate for use with a population not familiar with research techniques (Nash, 1978).

- b) It is a convenient vehicle for predicting the future (Ibid).
- c) Delphi is comparatively inexpensive, quick and involves much less effort than a conference. A well-designed, mailed questionnaire can elicit information from relatively large numbers of participants who cannot physically come together (Helmer, 1966; Pill, 1977; Rabiega, 1982; Riggs, 1983).
- d) Empirical evidence has shown that the group consensus in Delphi has increased accuracy compared with other kinds of group opinions (Dalkey, 1968).
- e) On issues that are uncertain and intangible the Delphi Technique has been able to generate a consensus so that forecasting and planning can proceed (Pill, 1971).
- f) The use of systematic procedures, such as in Delphi, lend an air of objectivity to the outcome (Pill, 1971).
- g) When managed properly, Delphi exercises can have a highly motivating effect on respondents. They also tend to produce a high degree of panel commitment to the output (Ibid).
- h) Delphi's features of response anonymity, controlled information feedback, and statistical group response allow an equal opportunity for respondents to affect decision-making. This, in turn, reduces any group pressure for conformity or 'band-wagon' effect and plays down the influence of dominant, highly articulate or high-status committee members (Helmer, 1966; Pill, 1971; Stenberg, 1979; Riggs, 1983).

- i) Respondent attrition rates appear minimal and judgements of individual's hostility to one another may also be lessened.
- j) Delphi exercises often accommodate novel and interesting feedback to respondents, thus minimising the possibility of overlooking some divergent viewpoints (Pill, 1971; Battersby, 1979; Riggs, 1983).
- k) Modifications to Delphi have meant that 'expert' respondents are no longer limited to the 'highly educated and experienced specialist' but, rather, they can include people who may contribute to the relevant information required. This creates in Delphi a more socially representative tool (Cyphert and Gant, 1970).
- l) As a pedagogical tool, Delphi provides 'explorers' with lots of simulated situations which can lead to creative planning and decision-making (Weaver, 1972).

A summary list of the disadvantages of Delphi is shown below:

#### Disadvantages

- a) Delphi exercises tend to be administratively complex and often take several weeks, or even months, to complete (Preble, 1983).
- b) The panel selection method can lead to a loss of a sampling technique which is a reliability requirement in any research work. This may cause doubts concerning the efficacy and representativeness of an 'expert' panel. Moreover, in some cases, it may be problematic as some expert respondents may be known to each other

and therefore their responses may not be strictly independent (Rabiega, 1982; Preble, 1983).

- c) If the questionnaires are poorly designed and vague, communication misunderstandings may occur and responses may be of little value for analysis (Preble, 1983).
- d) In the case of scaling the opinions, there is a problem of assigning a numerical value to what is essentially an opinion.
- e) Delphi has reasonable forecast accuracy but the long-range accuracy of the technique is difficult to determine (Preble, 1983).
- f) The users of Delphi may rely heavily on it to make decisions rather than use it as an information-gathering and option-generating tool (Turoff, 1971).

#### VARIATIONS OF DELPHI AND ITS APPLICATIONS

Traditionally, the Delphi Technique was developed for the purpose of forecasting and policy-planning. However, it has been modified as a tool for decision-making. Weaver (1971) has classified Delphis into two distinct types, as follows:

- a) The Traditional or Exploratory Delphi, as initiated by the original 'Project Delphi'. This application of the Delphi Technique has the goal of forecasting and seeks to develop accurate pictures of the future by generating consensus concerning a set of events that is expected to occur.
- b) The Conventional or Normative Delphi, as exemplified by many current Delphi studies. This type of Delphi has prescriptive direction, i.e. it is designed to obtain consensus of a set

of events, issues or goals that is desired, rather than expected.

Rauch (1979) has also classified different Delphi studies and has divided them into three types, as follows:

- a) The Classical or Traditional Delphi. This type of Delphi is used as a tool for obtaining a group opinion through an anonymous, multilevel group interaction. It can be applied with the greater confidence in the natural sciences and engineering. This is similar to Weaver's Exploratory Delphi.
- b) The Policy Delphi is modified from the Classical Delphi as the latter's application may not be as suitable for the analysis of very controversial social and political issues. It is a tool to collect ideas to describe events. Again, this corresponds closely with Weaver's Normative Delphi.
- c) The Decision Delphi has a prescriptive goal in that it solicits from the panel the general lines of thinking in complex social situations, then coordinates and structures this thinking in order to arrive at decisions which influence social developments.

From the plethora of Delphi studies now available, Linstone and Turoff (1975, p.4), found that apart from its use as a forecasting tool, Delphi has wide application in the following areas:

- a) gathering current and historical data not accurately known or available;
- b) examining the significance of historical events;
- c) evaluating possible budget allocations;

- d) exploring urban and regional planning;
- e) planning university campus and curriculum development;
- f) putting together the structure of a model;
- g) delineating the 'pros' and 'cons' associated with potential policy options;
- h) developing causal relationships in complex economic or social phenomena;
- i) distinguishing and clarifying real and perceived human motivations; and
- j) exposing priorities of personal values, social goals.

Moreover, McGaw et al. (1976, p.61), Stenberg (1971, p.381) and Preble (1983, p.76) found that Delphi is further applied in:

- a) medical planning;
- b) military planning;
- c) educational problem-solving;
- d) corporate and business affairs;
- e) transportation;
- f) communication;
- g) public budgeting; and
- h) goal-setting.

The following section of this chapter focuses on the applications of the Delphi Technique in the field of education.

#### APPLICATIONS OF DELPHI IN EDUCATION

Delphi studies in education date from the mid 1960s. One of the earlier studies was conducted by Helmer (1966) as part of the 1965

Kettering Project<sup>(2)</sup>. The Delphi Technique here was designed to produce a list of goals or innovative futures for education based on the consensus of various groups of experts. A chart of proposed educational innovations was produced as a final product.

Table 2, on the following page, shows an updated listing of Delphi studies in education originally compiled by Elms and Battersby (1979, pp.14&15).

Referring to Table 2 it can be seen that, while in some studies the Exploratory Delphi has been used for forecasting educational futures, virtually all Delphi applications are Normative in nature. Moreover, the applications of Delphi shown in Table 2 demonstrate that the Delphi Technique is capable of satisfying a wide range of educational research needs. These studies also show some of the different modifications of the Delphi, such as, for example, in the selection of the panel where some studies have used only a single group of expert respondents while others have used either several groups or a range of interest groups as their respondents.

An application of the Delphi Technique in education is briefly detailed below using as the example Cyphert and Gant's (1970) study which is listed in Table 2.

Cyphert and Gant used the Delphi Technique to elicit suggestions in defining objectives for the School of Education at the University of Virginia for the next decade. They used a four-round Delphi inquiry with an open-ended first round. A panel of 421 respondents was selected for the study. These respondents represented

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(2) For a detailed account of the 1965 Kettering Project, refer to O. Helmer, "The Use Of The Delphi Technique In Problems Of Educational Innovation". Rand Paper, p.3499, Santa Monica, California, RAND Corporation, 1966.

Table 2: Delphi Studies in Education

Source: Elms and Battersby, 1979, pp.14&amp;15.

Researcher(s)	Year	Title/Object of Study	Country	Type	Researcher(s)	Year	Title/Object of Study	Country	Type
Single group of Expert Respondents					S. Cochran M.M. Crowley B.N. Overby R.C. Judd	1970	To evaluate a list of teacher characteristics.		
T.J. Gordon R. Sahr	1968	To collect conjectures about prospective developments which might have an impact on educational administration their probable dates of occurrence, & the desirability of such developments, should they occur.	U.S.A.	Exploratory	D.P. Norton	1970	To look into university needs.	U.S.A.	Normative
H.J. Dyck G.J. Emery	1970	To prepare a series of forecasts on social conditions which tend to be important in educational planning.	Canada	Exploratory	D.F. Berghofer	1970	To examine the relationship between education & society within next thirty years.	U.S.A.	Normative
J. Jacobson	1970	Designing Education for the Future-A One State Study (Utah).	U.S.A.	Normative	R.E. Peterson	1971	To refine the Institutional Inventory developed by N.P. Uhl.	U.S.A.	Normative
A.M. Fox W.K. Brookshire	1971	To list the ingredients of effective college teaching.	U.S.A.	Normative	D. Battersby	1977	To arrive at some consensus views on what makes a beginning teacher successful during his first year of teaching.	New Zealand	Normative
S.C.T. Clark H.T. Coutts	1971	To formulate statements about the future of teacher education.	Canada	Normative	P. Kruus	1983	To gain some feeling of what various groups believed to be the most desirable future for Carleton University.	Canada	Normative
W.E. Moore R.M. Wines	1973	To determine the reaction among secondary school inspectors to proposed changes in high school examinations, and the effects of these changes on school assessment procedures.	Australia	Normative	Range of client Interest Groups as Respondents				
V. Faherty	1979	To achieve a level of consensus relative to theories, methodologies & content areas of continuing social work education & to project a functional model of continuing social work education useful for intermediate & long-range program planning.	U.S.A.	Exploratory	D.P. Anderson	1970	To simulate speculations about desirable goals for a country school district in Ohio.	U.S.A.	Normative
M. Seaz-Cessey	1982	To obtain a consensus on the most important tasks that needed to be undertaken for education in Developing Countries.	New Zealand	Normative	D. Hudspeth	1970	To study the perceived needs of vocational educational in New York State.	U.S.A.	Normative
W.A. Rabiaga	1982	To describe another alternative teaching tool, the classroom Delphi which is modified to organize & generate classroom discussion.	U.S.A.	Normative	F.R. Cypert W.L. Gant	1970	To clarify and assess the wishes, aspirations & opinions of clientele respecting objectives for the school of Education at the University of Virginia.	U.S.A.	Normative
T. Spinell	1983	To attempt to forecast the long-range general environment for higher education in the State of Michigan.	U.S.A.	Exploratory	V. Mason	1970	To probe the effectiveness of student participation in junior college administration.		Normative
Several groups of expert Respondents					N.P. Uhl	1970	To investigate (in a small number of institutions) what on-campus & off-campus grounds perceive the goals of their institutions to be, as well as what they believe the goals to be.		Normative
O. Helmer	1966	To produce a list of goals & innovative futures for education.	U.S.A.	Normative	T. Barrett, J. Roe, D. Hayes, R. Brown, I. Krapel, W. Heincke, W. Samuelson	1971	To determine the school & community attitudes to year-round school operation in Nebraska.	U.S.A.	Normative
S. Cochran M.M. Crowley B.N. Overby R.C. Judd	1970	To evaluate a list of teacher characteristics.			H.T. Coutts	1972	To generate a number of targets for the future of teacher education.		Normative
					S.T. Deutsch W.L. Hann	1975	To determine whether educators, students, community teachers, collectively & individually, differ in their opinion of the importance of secondary educational goals.	U.S.A.	Normative

the significant power structure relating to this School of Education and were chosen on the assumption that:

".....what those persons in positions of influence believe will happen or should happen is the best indication of what actually will occur in the near future."  
(p.420).

The Delphi procedure used by Cyphert and Gant was as follows:

Round One - Participants were asked to suggest the prime targets on which the School of Education should concentrate its energies and resources for the next decade. Sixty-eight per cent of the sample replied to this round, offering 750 individual suggestions which were reduced to 61 generic statements. The returns from Round One formed the basis for the Round Two questionnaire.

Round Two - These 61 items were fed back to the participants. They were asked to differentiate between these 61 statements in a hierarchical fashion and rate each item on a five-point scale. Two hundred and sixty-two participants replied in this round. The responses were processed to determine the distribution and mode of priorities for each item. On this basis, the Round Three questionnaire was constructed.

Round Three - Individuals were fed back their own rating and the group consensus on each item. In the light of this feedback, each respondent was requested to rerate all the items. Participants who wished to remain outside the consensus on an item(s) were asked to state their reasons for doing so. Sixty-two per cent of the original sample returned responses.

From the responses to Round Three a mode of 'priorities' was determined and this acted as a basis for the fourth questionnaire.

Round Four - The results from the third round, plus 218 items representing the dissenting opinions from Round Three, were fed back to the respondents. The panel was asked to rate each item based on their own values and knowledge of both the minority and majority views. Sixty-two per cent of the original sample returned responses.

The analysis of the results centred around the goals that attained high priority for the sample. Some of these high- and low-priority goals are shown below:

A Sample of Cyphert And Gant's High- And Low-Priority Goals

High Priority Goals	<p>Priority 1: Increasing the number of talented young people who enter and remain in the teaching profession.</p> <p>Priority 2: Developing better methodology of teaching through research on such topics as motivation, study skills, individual differences, child development, creativity, the learning process, constructive thinking, cost, communication, educating the physically handicapped, teaching large groups and discipline.</p> <p>Priority 3: Preparing educators to function effectively in innovative programmes that deal with constantly changing educational problems.</p> <p>Priority 4: Developing knowledge concerning the effective preparation of teachers.</p> <p>Priority 6: Developing programmes of nationally recognised excellence.</p> <p>Priority 8: Attracting more men into elementary education.</p> <p>Priority 10: Developing more equally balanced school divisions.</p>
Low Priority Goals	<p>Priority 56: Developing a knowledge base that sets the parameters of capability and modus operandi of a school of education's function.</p> <p>Priority 57: Modify the curriculum of the School of Education to give greater attention to Negro history, occupational orientation of children and citizenship education.</p> <p>Priority 58: Assisting schools to develop better school buildings through such means as standard construction elements.</p> <p>Priority 59: Preparing interdisciplinary courses for high school adoption.</p> <p>Priority 60: Preparing plans that schools could use for goal definition.</p> <p>Priority 61: Eliminating competition among institutions of higher learning in Virginia.</p>

According to Cyphert and Gant, their data generated from this four-round Delphi proved most useful in formulating future targets of the School of Education at the University of Virginia and, moreover, the outcomes 'made influential persons aware of the School's existence and awakened them to a realisation of its future accomplishments' (Cyphert and Gant, 1970, p.425).

Generally, then, the Delphi method is used primarily in education for the purposes of:

- a) educational planning;
- b) developing desired educational events;
- c) designing educational evaluation; and
- d) searching out educational and curricular objectives.

Although the Delphi Technique has become a useful research tool in education in general, its application in school administration, which is the focus of the present study, is still in its infancy. The last section of this chapter details the objectives of the study and the accompanying rationale.

#### RATIONALE FOR THIS STUDY

Since the development of the Delphi Technique in 1948 it has been used widely in many fields to elicit expert consensus on certain issues so as to facilitate forecasting, policy-planning, and decision-making. Table 2 shows that although Delphi is widely used in the field of education there have been few, if any, applications in school administration (Schmuck et al., 1977 and Johnston, 1981).

Accordingly, the intention of this study was to investigate the feasibility of using the Delphi Technique in school administration and, as such, the study had two objectives, as follows:

- a) To Ascertain The Challenges Facing School Administrators During The Remainder Of This Decade, Using The Delphi Technique. (Phase One of the study)

Phase One of the present study focused on the above objective for three reasons:

Firstly, it is a typical Delphi problem in that it seeks to arrive at a consensus of opinion about a number of challenges which, in this case, are those facing school administrators during the remainder of this decade.

Secondly, the substantive issue concerning the challenges facing school administrators is relevant to current debate in school administration. For instance, many prominent educators, such as Culbertson and Renwick, agree on the importance of school administrators having an appreciation or understanding of the likely challenges they are to face during the coming decades, and how these challenges might be met.

And, thirdly, it was decided to undertake Phase One of this study so as to evaluate the feasibility of using the Delphi Technique as a tool for school administrators. This constituted Phase Two of the study with the objective being:

- b) To Evaluate The Potential Of The Delphi Technique For School Administrators. (Phase Two of the study)

In their recent studies, Schmuck et al. (1977) and Johnston (1981) reviewed the various research tools used by school administrators. Their reviews indicated that the Delphi Technique has rarely been employed in the school administration investigations.

This second objective, then, sought to focus on some of the methodological and operational aspects of the use of Delphi arising from studying the challenges facing school administrators during the remainder of this decade. In particular, it was hoped that the advantages and disadvantages of the technique for school administrators would be identified.

#### CONCLUSION

In summary, this chapter has provided: (i) a description of the Delphi Technique; (ii) a discussion of its history and development, its characteristics plus its advantages and disadvantages; (iii) information on the variations and the applications of the technique; and (iv) the objectives and rationale for the present study.

The following chapter will discuss the research design of this present investigation.

CHAPTER TWO

RESEARCH DESIGN

## INTRODUCTION

Chapter One concluded with a discussion of the two major objectives of the present study. These objectives were:

- a) To ascertain the challenges facing school administrators during the remainder of this decade, using the Delphi Technique.
- b) To evaluate the potential of the Delphi Technique for school administration.

The review of the literature on Delphi in the previous chapter outlined variations and modifications to the technique, and confirmed Judd's (1975, p.175) view that:

"There is no single monolithic structure to the Delphi Technique".

Indeed, each Delphi method of investigation is dictated by the research problem under study. The problem outlined in the first objective of this study necessitated a Normative Delphi design, which would consist of three to four rounds of questionnaires. Here, the aim was to arrive at a general consensus from a panel of school administrators, about the challenges facing them during the remainder of this decade. Once consensus was reached, a follow-up evaluative questionnaire would be designed to assess the potential of the Delphi Technique for school administrators.

This chapter will present information on the framework adopted in this study, the selection of sample, and the Delphi procedure used.

### THE FRAMEWORK OF THE STUDY

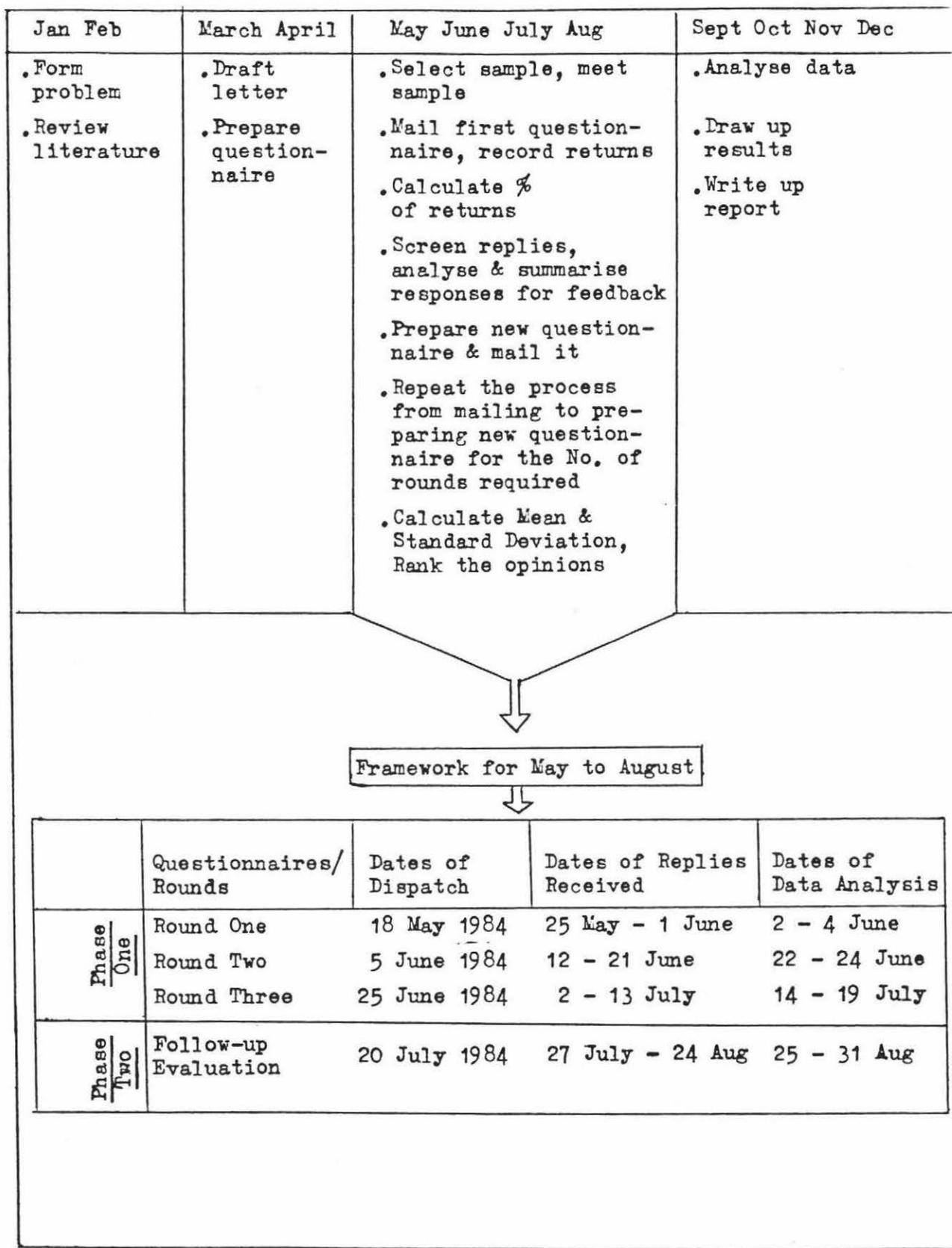
Figure 2, on the following page, shows the overall framework of this Delphi project. In January and February 1984, the investigator formulated the problem and reviewed the relevant literature. During March and April, the research design was planned, and the first letter and questionnaire were drafted and prepared. From May through to August the sample was selected and the Delphi procedure of administering the rounds of questionnaires, screening editing, summarising the returns, and preparing new questionnaires was carried out. From September to December the data was analysed, the results were drawn up, and the report was written up (see Figure 2).

For the period from May through to August an inset framework shows the dates of questionnaire dispatch, when replies were received, and when data analysis was carried out (see Figure 2, inset).

### THE SELECTION OF THE SAMPLE

Both the objectives of this study necessitated the selection of a sample with knowledge of current events in school administration in New Zealand. The Delphi literature revealed that although selection of a large sample (usually hundreds of participants) has its advantages, it also has its hazards. For instance, the mounting administrative work (Cyphert and Gant, 1970; and McGaw et al., 1976), the high cost and the length of time involved, the loss of panel participation and the lack of representativeness of the remaining participants (Judd, 1972) have been reported as disadvantages of using large numbers of participants.

Figure 2: The Overall Framework Of The Study (1984)



With the consideration that this project was to be undertaken by one investigator, who was inhibited by a lack of finance, facilities and time, it was decided to select a relatively small group of school administrators as the sample. At the time of sample selection, a group of 40 school administrators, enrolled in a Diploma in Educational Administration programme, had gathered at Massey University for their annual vacation course. Further investigation revealed that these school administrators came from various rural and urban primary, intermediate and high schools throughout New Zealand (see Map in Appendix A). After consultation with the lecturers in charge of this programme, it was decided to approach this group of school administrators and ask them to become participants in this study.

Accordingly, the investigator briefed the sample concerning the study. Thirty-three out of the 40 school administrators agreed to participate in the study. They were told that three to four rounds of questionnaires would be mailed to them over the coming months<sup>(3)</sup>. Also, they were instructed not to confer with one another in their responses, and to return their completed questionnaires promptly within the stipulated time.

The 33 volunteers came from different levels of the school system and from different parts of the North and South Islands of New Zealand. They held various administrative positions in their respective schools as Table 3 shows. Of the participants, 21 were males and 12 females, giving a male-to-female ratio of approximately 2:1, respectively (see Table 3).

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(3) To strive for the response anonymity feature of the Delphi Technique, it was decided to elicit the opinions of the panel only after they had returned home from their course.

All these respondents had university degrees or the equivalent, with the typical qualification being a Bachelor of Arts and Post-graduate Diploma in Education. The age of the sample ranged from 25 to 56, with an average age being in the mid-30s.

Table 3: The Sample

Panel's Position in School	Male	Female	Total
Principal	2	1	3
Deputy Principal	5	2	7
Dean/Head of Department	9	4	13
Senior Teacher	1	2	3
Teacher with Position of Responsibility	2	0	2
Form Teacher	1	2	3
Careers Adviser	0	1	1
Curriculum Coordinator	1	0	1
Total	21	12	33

With the selection of the sample completed the next process in this Delphi project was to design and implement the questionnaire rounds.

#### THE DELPHI PROCEDURE

In the Delphi process there are contentious views concerning the number of questionnaire 'rounds' necessary for the identification of an acceptable response consensus. Cyphert and Gant (1970), in their exhaustive analysis of the Delphi investigations, concluded that 99 per cent of respondents' changes in opinion had taken place by the third round of the Delphi procedure. The findings of Weatherman and Swenson (1974) also confirmed that for most Delphis, three rounds are usually adequate. Dajani, Sincoff and Talley (1979),

in their discussion of this issue, suggested that it is important for Delphi investigators to look into the consistency of responses between successive rounds and the stability of individual's responses to the given questions before terminating a Delphi investigation.

In the light of the above findings it was decided that for Phase One, a three-round Delphi format would be employed, and that additional rounds would be added if a consensus was not reached by the third round.

The three rounds of questionnaires used in this study are described below:

#### Round One

In this round the panel of 33 participants was sent an introductory letter of explanation (see Appendix B). The letter informed them that this project would employ three or four rounds of questionnaires, and that the second and subsequent questionnaires would be based on information gathered from the previous rounds. A stamped-reply envelope was supplied with each round to facilitate the prompt return of the questionnaires. Participants were assured that during the course of the study their identity would be kept confidential.

Accompanying this letter was the Round One questionnaire (see Appendix B), with an outline of the problem. It read as follows:

"What do you see as the challenges facing school administrators during the remainder of this decade?"

An open-ended first round was used and the participants were asked to write down their responses in the light of the problem. They were urged not to confer with anyone and to return their completed questionnaires within the specified time.

Thirty (90.9%) out of the 33 original volunteers<sup>(4)</sup> replied to this first round. Their responses, totalling 136 'challenges', were screened and scrutinised to eliminate any duplicate responses. A final list of 34 items representing the respondents' Round One comments (see Appendix C), on the challenges they envisaged, was compiled as information for Round Two questionnaire and feedback.

The compilation of the final list of 34 'challenges' was done by firstly screening all the Round One responses. Statements with similar meanings or themes were clustered together. They were then screened again to eliminate any duplicate answers. Subsequently, each group of related statements was scrutinised and summarised into a single, concise statement. An example of how a group of related responses in Round One was reduced to a concise statement can be detailed. A list of all the original statements concerning 'falling rolls', which a number of participants viewed as a 'challenge' facing school administrators during the remainder of this decade, appears on the following page. These statements were extracted and clustered during the first screening of responses.

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(4) The three dropout volunteers were not followed up because it was assumed that given the voluntary nature of the study, respondents who did not return questionnaires no longer wished to participate

- 1) "At present, falling rolls mean less teachers are required per school. This means incompetent staff are going but how will administrators face the challenge of deciding which competent teacher to lose".
- 2) "Coping with the consequences of falling rolls and staff redundancies".
- 3) "Helping their staff to adjust to falling rolls and changing subject orientation".
- 4) "Coping with fall in rolls".
- 5) "Falling rolls in relation to staffing".
- 6) "Falling rolls and subsequent teacher-pupil ratio problems".
- 7) "Falling rolls and the effects on staffing".
- 8) "Falling rolls--loss of PR allocation, job security, being able to operate and to offer full range of subjects and staff these subjects".
- 9) "Coping with falling roll problems i.e. teacher layoffs and resulting problems of low morale, poor recruitment levels and possible staff shortages especially in technical and economic areas".
- 10) "To maintain professional direction and morale -- to promote professional growth and responsibility at a time when falling rolls and economic pressures are showing the avenues of promotion and add to erosion of morale prompted by public and political criticism".
- 11) "Falling rolls --lack of promotion opportunities for younger staff --loss of status for existing middle managers especially senior masters, PR4's and PR3's".
- 12) "Falling school rolls and the management of contraction".
- 13) "Offering a range of subjects inspite of the restrictions imposed by falling rolls".

From this list, four statements concerning 'falling rolls' were retained. The rest were adjusted to be similar to one or more of these four statements. For example,

statement Nos. 2, 4, 5, 7 and 12  
were similar to No. 1;

statement Nos. 3, 12 and 13  
were similar to No. 8;

statement Nos. 11 and 12  
were similar to No. 10; and

statement No. 9  
was similar to Nos. 1 and 8.

The four statements retained were:

- 1) At present, falling rolls mean less teachers are required per school. This means incompetent staff are going but how will administrators face the challenge of deciding which competent teacher to lose.
- 6) Falling rolls and subsequent teacher-pupil ratio problems.
- 8) Falling rolls—loss of PR allocation, job security, being able to operate and to offer full range of subjects and staff these subjects.
- 10) To maintain professional direction and morale — to promote professional growth and responsibility at a time when falling rolls and economic pressures are slowing the avenues of promotion and add to erosion of morale prompted by public and political criticism.

Subsequently, these four statements were carefully examined and scrutinised, then summarised into a single, concise statement:

"Falling rolls and management of contraction."

From this type of screening, scrutinising and summarising process, a final list of 34 challenges was derived from the original list of 136 statements. This final list of 34 items was mailed to the participants as the feedback information for Round Two.

### Round Two

Each of the 30 respondents who replied to Round One was sent a covering letter with instructions. Accompanying it were: a copy of the participant's previous Round One responses; the summary list of 34 comments contributed by the panel to the Round One questionnaire; and also the Round Two questionnaire (see Appendix C).

The second questionnaire outlined the problem statement again. The participants were requested to reconsider their Round One responses, bearing in mind the group's comments, and to form a short list of concise statements concerning the challenges facing school admin-

istrators during the remainder of this decade. They were given the freedom to retain their original Round One responses and/or to use key statements from the feedback summary list which they might wish to add to, or modify (see Round Two in Appendix C).

Only one participant did not return this round's responses. The 29 (96.7%) completed questionnaires were examined and the duplicate statements removed. When all the responses were aggregated, it was found that 33 of the 34 group summary comments from Round One were reinstated. The item which did not receive a mention was:

"Making students aware of the place of  
Christianity in an increasingly secular  
society."

There was an addition of nine new challenges which the participants thought would face school administrators during the remainder of this decade.

The nine new items were:

- 1) Coping with inadequate and incompetent staff.
- 2) Providing a balance between satisfying the school and community demands, and maintaining freedom for teacher and administrators to develop the well-being, initiative, and creativity of students.
- 3) Restricted promotion prospects.
- 4) Preparing students to adapt to new technologies.
- 5) Encouraging female staff to take up administrative jobs and ensuring that they have equality of opportunity.(5)
- 6) Boosting the status of outdoor education, music, art and other cultural experiences.
- 7) Examination-orientated education versus job-orientated education.
- 8) Educating for self-actualisation.
- 9) Ensuring that we do not lose our present assets in attempts to make further gains.

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(5) This item was derived from splitting item No. 33 in Round One (see Table 7).

These nine new items were listed by eight participants of the sample. Thus, from Round Two, a new list of 42 'challenge' statements was compiled (see Appendix D). This formed the basis for the Round Three questionnaire and the feedback information.

At the completion of Round Two there appeared to be an emerging consensus on the challenges which the participants envisaged as facing the school administrators during the remainder of this decade.

### Round Three

In this round, each of the remaining 29 participants was sent a package including a covering letter, the new summary list of 'challenge' comments, and the Round Three questionnaire. The instructions directed the respondents, firstly, to consider the panel's list of comments, then to express their opinions by indicating, with the help of a 5-point Likert-type scale provided, the relative importance of each item in relation to the challenges facing school administration during the remainder of this decade (see Appendix D). The relative importance of each item was required for the calculation of the Mean and Standard Deviation, which could help in the assessment of the consensus.

The Likert-type scale was used because of its simplicity and suitability for the Delphi investigation (see Cochran et al., 1970; Fox and Brookshire, 1970; Judd, 1972; Deutsch and Hamm, 1975).

The responses were to be given according to the following code:

- Extremely Important (5)
- Very Important (4)
- Of Some Importance (3)
- Of Little Importance (2)
- Of No Importance (1)

Twenty-seven (93.1%) participants returned responses. Their replies were analysed using the Mean and Standard Deviation for each of the 'challenge' items listed. Then the items were listed according to their rank of importance, based on Mean and Standard Deviation values (Round Three results, shown in Appendix E).

Using the Mean values, the item with the highest Mean was ranked the highest, and when there was a tie in the Mean values of two or more items, the item with the smallest Standard Deviation, i.e. the highest consensus, would be ranked highest amongst the tied items. For example, this can be seen in the Selection of Round Three Results, as follows:

<u>Rank</u>	<u>Items/Challenges</u>	<u>Mean</u>	<u>Standard Deviation</u>
1	Improving staff professional competency and development through training, closer supervision & collegial support.	4.33	0.6202
2	Providing relevant and meaningful education to reflect the needs of students, community, society, economy & government.	4.27	0.8744
3	Providing staff with a sense of purpose, self worth & achievement.	4.22	0.8473
4	Providing a balance between satisfying the school & community demands, and maintaining freedom for teachers & administrators to develop the well-being, initiative & creativity of students.	4.04	0.8077
= 5	Teaching students to have flexible attitudes & versatile skills.	4.04	0.8540
= 5	Developing attitudes for life-long education.	4.04	0.8540
6	Developing further the concept of equal educational opportunity.	4.04	0.8979

Referring to the above selection, the item ranked 1 had the highest Mean compared to all the other items. The item ranked 2 had the second highest Mean, and so on. The items ranked from 4 to 7 had

tied Mean values. Therefore, in this case, the item with the smallest Standard Deviation was ranked the highest amongst them.

A complete list of the Round Three responses was compiled using the values of Mean, Standard Deviation and Rank.

At this stage in the research, a further analysis was carried out on the results of Round Three to ascertain the degree of consensus of opinion on the challenges facing the school administrators during the remainder of this decade.

Cyphert and Gant (1970), as well as Weatherman and Swenson (1974), had concluded that the opinions given in three rounds of most Delphi investigations should be adequate for a general consensus. To confirm this, the Coefficient of Variation (V), was used. The use of this procedure in Delphi investigations was developed by English and Kernan (1976).

English and Kernan, in their Delphi study of the future of air travel and aircraft technology, used the Coefficient of Variation in conjunction with a decision rule, as the stopping criterion. The Coefficient of Variation was calculated by dividing the Standard Deviation by the Mean of the responses. They selected ranges for the Coefficient of Variation and associated these ranges with decision rules that defined consensus, and hence a strategy for continuing or terminating Delphi rounds (see Table 4). They recommended the use of the Coefficient of Variation as a measure of stability in Delphi studies. This can be achieved by checking for changes in the Coefficient of Variation within each round and between two successive rounds and terminating the inquiry when such changes assume a predetermined small value.

Table 4: Coefficient of Variation As A Stopping Criterion

Coefficient of Variation (V)	Decision Rule
$0 < V \leq 0.5$	Good degree of consensus; no need for an additional round
$0.5 < V \leq 0.8$	Less than a satisfactory degree of consensus; possible need for an additional round
$V \geq 0.8$	Poor degree of consensus; definite need for an additional round

Source: G.M. English and G.L. Kernan, "The Prediction Of Air Travel And Aircraft Technology To The Year 2000 Using The Delphi Method". Transport Res., Vol. 10, pp.1-8, 1976.

Referring to Table 4, if the value of (V) is greater than 0 but equal to or smaller than 0.5, i.e.  $0 < V \leq 0.5$ , then there is a high degree of consensus and no additional round is necessary. If (V) is greater than 0.5 but equal to or smaller than 0.8, i.e.  $0.5 < V \leq 0.8$ , there is a less than satisfactory degree of consensus and there is a possible need for an additional round. However, if (V) is equal to or greater than 0.8, i.e.  $V \geq 0.8$ , the consensus is poor and there is a definite need for a further round.

As the ranges chosen by English and Kernan (Dajani et al., 1979, p.86) were based on the decision rules that defined consensus and their application had proven to be useful as a strategy for termination of the Delphi rounds, it was decided to use the same ranges in this present study.

The calculation of the Coefficient of Variation (see Table 5) for all the items in the Round Three results indicated that the value of (V) for all the items was greater than 0 but equal to or greater than 0.5, i.e.  $0 < V \leq 0.5$ . Thus it was concluded that no further

round was necessary for this phase of this study.

Table 5: Calculation Of The Coefficient of Variation (V)  
From Round Three Results

<u>Rank of</u> <u>Item</u>	<u>Mean</u>	<u>Standard</u> <u>Deviation</u>	<u>(V)</u>	<u>Rank of</u> <u>Item</u>	<u>Mean</u>	<u>Standard</u> <u>Deviation</u>	<u>(V)</u>
1	4.33	0.6202	0.14	27	3.41	1.0099	0.30
2	4.27	0.8744	0.21	28	3.41	0.8884	0.26
3	4.22	0.8473	0.20	29	3.37	0.7917	0.24
4	4.04	0.8979	0.22	30	3.35	1.0175	0.30
= 5	4.04	0.8540	0.21	31	3.33	1.1094	0.33
= 5	4.04	0.8540	0.21	32	3.03	0.7753	0.26
7	4.04	0.8077	0.20	33	3.27	0.8744	0.27
8	4.00	0.6794	0.17	34	3.26	0.9443	0.29
9	3.89	0.8006	0.21	35	3.19	0.7494	0.24
10	3.85	0.8640	0.22	36	3.15	1.0635	0.34
= 11	3.85	0.7181	0.19	37	3.11	1.2195	0.39
= 11	3.85	0.7181	0.19	38	2.93	0.6752	0.23
13	3.85	0.6624	0.17	39	2.92	0.7961	0.27
14	3.78	0.9740	0.26	40	2.88	0.9519	0.33
15	3.74	0.9027	0.24	41	2.85	0.8640	0.30
16	3.74	0.8590	0.23	42	2.67	0.8771	0.33
17	3.74	0.8130	0.22				
18	3.70	0.9533	0.26				
19	3.67	0.7338	0.20				
20	3.63	0.7917	0.22				
21	3.59	0.9306	0.26				
22	3.56	1.0860	0.31				
23	3.56	1.0500	0.30				
24	3.56	0.9740	0.27				
25	3.48	0.7530	0.22				
26	3.44	0.8473					

With a high degree of consensus already attained, a follow-up evaluation round which would help to achieve the second objective of the study, viz. assessing the potential of the Delphi Technique for school administrators, could proceed.

### FOLLOW-UP EVALUATION

In this follow-up round, the 27 panel members who completed Round Three were sent a covering letter, an analysis of Round Three responses together with a Follow-Up Respondent Evaluation Questionnaire (see Appendix E). This final phase was designed to elicit comments concerning the potential of the Delphi Technique for school administrators.

In the light of their previous participation and experience and the feedback results, the respondents were asked to respond briefly to the following open-ended questions:

- 1) To what degree do you concur with the results?
- 2) To what extent have your views about the future challenges facing school administrators changed during the course of this study?
- 3) As a participant, what were the main problems you faced in responding to the three questionnaires?
- 4) From your participation in this study, what do you see as some of the advantages and disadvantages of the Delphi Technique?
- 5) Prior to this study, have you ever participated in a Delphi Investigation?
- 6) General comments.

In this follow-up round, 20 (74.1%) of the remaining 27 respondents returned their responses and an analysis of their replies will be discussed in Chapter Four.

### CONCLUSION

In summary, then, this chapter outlined the research design adopted in this study. Details about the framework for the study, the

sample selection, the Delphi procedure, and the follow-up evaluation have been given. The following chapter will discuss the results obtained for the three rounds of questionnaires in Phase One of this project.

CHAPTER THREE

RESULTS AND DISCUSSION

## INTRODUCTION

The research design of the present study was outlined in the previous chapter. This present chapter will detail the results obtained from Rounds One, Two and Three of this Delphi exercise. These results will be analysed and discussed in the light of the first research objective which was:

"To ascertain the challenges facing school administrators during the remainder of this decade, using the Delphi Technique.

## ROUND ONE RESULTS

In response to the request to write down their opinions concerning what they would envisage as the challenges facing school administrators during the remainder of this decade (see Round One in Appendix B), the participants' returns contributed a total of 136 response statements. An example of the types of items listed is shown below and further examples are given in Appendix G.

An example of a Round One response:

"The challenges are:

- 1) falling rolls in relation to staffing;
- 2) changes in school infrastructure;
- 3) increasing attempts to integrate ethnic groups into the schooling pattern of the past; and
- 4) possible increasing control by government in the running of schools, its aims and management."

Through the process of screening, clustering, eliminating, editing and summarising that was outlined in the previous chapter, a summary list of 34 concise statements was compiled (see Table 6). These 'challenge' items were not listed in any priority; rather, an attempt

Table 6: A Summary List Of The Respondents' Round One Comments

The challenges facing school administrators during the remainder of this decade are:

- 1) Catering for students who face unemployment.
- 2) Training for adequate and fulfilling use of leisure time.
- 3) Curriculum review - core and non-core.
- 4) Broadening the range of subjects in school
- 5) Teaching students to have flexible attitudes and versatile skills.
- 6) Ensuring greater freedom of choice in materials being used in class.
- 7) Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.
- 8) Falling rolls and management of contraction.
- 9) Developing further the concept of equal educational opportunity.
- 10) Multiculturalism in community, school and classroom.
- 11) Immobile and aging staff.
- 12) Staff stress.
- 13) Untrained school administrators and teaching staff.
- 14) Improving staff professional competency through further training, closer supervision and collegial support.
- 15) Providing staff with a sense of purpose and self-worth.
- 16) Coping with non-dynamic and non-professional staff.
- 17) Allowing and providing opportunity for teacher experimentation, adaptation, research and discussion.
- 18) Breaking traditional hierarchies of responsibilities to provide new experience in the profession.
- 19) Achieving less bureaucracy in schools.
- 20) Arousing parents' awareness of child-care responsibilities.
- 21) Dealing with a more informed and more critical community.
- 22) Adopting the computer as an educational and administrative tool.
- 23) Coping with the conflict in producing scientific-technologically able students versus culturally aware students.
- 24) Making the most efficient use of resources available.
- 25) Removing U.E.
- 26) Developing Form Six Certificate Courses.
- 27) Promoting public and political awareness to ensure the maintenance and development of educational institutions.
- 28) Maintaining school's function despite pressures from various groups.
- 29) Coping with social changes and social pressures.
- 30) Developing attitudes for life-long education.
- 31) Meeting the needs of the gifted and less able students.
- 32) Coping with pressure to be more accountable to Boards of Governors.
- 33) Ensuring that female students and female staff have equality of opportunity.
- 34) Making students aware of the place of Christianity in an increasingly secular society.

was made to arrange in close proximity those items with a similar theme. For instance, items 1) and 2) were related to unemployment; items 3) and 4) focused on curriculum issues; items 9) and 10) dealt with educational equality; items 11 to 19) were concerned with different staff issues; items 22) and 23) related to educational technological issues; items 25) and 26) centred on evaluation of students; and items 27 to 32) were challenges relating to developing and maintaining the school's functions.

Items 5), 6), 7), 8), 20), 21), 24), 33) and 34) were categorised as 'other'.

In summary, eight general categories of items emerged from the Round One results. These were: unemployment; curriculum issues; educational equality; staff issues; educational technology; student evaluation; school functions; and 'other'. The largest group consisted of items related to staff issues.

After the collation of results from the first round the resultant summary list formed the basis for the Round Two questionnaire and the feedback information.

#### ROUND TWO RESULTS

In this round the respondents were asked to review their previous opinions, in the light of both the feedback information given on the panel's summary list of 34 statements and their own individual original replies to Round One. They were requested to compile a short list of concise statements again on the challenges facing school administrators during the remainder of this decade. The participants were told that they may reinstate their original

standpoint, summarise their comments, or choose key statements from the summary list, which they might wish to add to or modify (see Round Two in Appendix C).

When the Round Two responses were returned, screening was done to remove any duplicate 'challenges'. The responses showed that no participant rejected any of his/her original standpoints (see Appendix H for some examples of Round Two replies).

A list of 42 items resulted from this second round (see Table 7), 33 of which also appeared in Round One. Only one statement was deleted from the list of 34 items in Table 6, and nine new 'challenges' were added in this round. The deleted item and the nine new statements were mentioned in Chapter Two (see p. 34).

These nine new items, added to the Round Two summary list (see Table 7), were numbered 13), 19), 21), 25), 38), 39), 40), 41) and 42), respectively. These challenges were inserted into the list and were clustered near items of the same category. Through the screening process carried out in this round, item Nos. 14), 16), 27), 35) and 37) were further edited.

From the replies to Round Two, the fact that only one 'challenge' item was dropped from the initial summary list indicated that members of the panel were probably nearing consensus on the challenges likely to face school administrators during this decade. The nine new items added to the list showed that some<sup>(6)</sup> participants expressed new standpoints as their perspectives on the challenges were widened, possibly by the feedback of information and most certainly by their involvement in this study.

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(6) These nine new items were contributed by eight of the participants.

The challenges facing school administrators during the remainder of this decade are:

- 1) Catering for students who face unemployment.
- 2) Training for adequate and fulfilling use of leisure time.
- 3) Curriculum review - core and non-core.
- 4) Broadening the range of subjects in school.
- 5) Teaching students to have flexible attitudes and versatile skills.
- 6) Ensuring greater freedom of choice in materials being used in class.
- 7) Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.
- 8) Falling rolls and management of contraction.
- 9) Developing further the concept of equal educational opportunity.
- 10) Multiculturalism in community, school and classroom.
- 11) Immobile and aging staff.
- 12) Staff stress.
- 13) Coping with inadequate and incompetent staff.
- 14) Improving staff professional competency through training.
- 15) Untrained school administrators and teaching staff.
- 16) Providing staff with a sense of purpose, self-worth and achievement.
- 17) Coping with non-dynamic/unmotivated and non-professional staff.
- 18) Allowing and providing opportunity for teacher experimentation, adaptation, research and discussion.
- 19) Providing a balance between satisfying the school and community demands and maintaining freedom for teachers and administrators to develop the well-being, initiative and creativity of students.
- 20) Breaking traditional hierarchies of responsibilities to provide new experiences in the profession.
- 21) Restricted promotion prospects.
- 22) Achieving less bureaucracy in schools.
- 23) Arousing parents' awareness of child-care responsibilities.
- 24) Dealing with a more informed and more critical community.
- 25) Preparing students to adapt to new technologies.
- 26) Adopting the computer as an educational and administrative tool.
- 27) Balancing the emphasis on technology with cultural awareness.
- 28) Making the most efficient use of resources available.
- 29) Removing U.E.
- 30) Developing Form Six Certificate Courses.
- 31) Promoting public and political awareness to ensure the maintenance and development of educational institutions.
- 32) Maintaining school's function despite pressures from various groups.
- 33) Coping with social changes and social pressures.
- 34) Developing attitudes for life-long education.
- 35) Meeting the needs and developing greater provision for the gifted, the reluctant and the less able students.
- 36) Coping with pressure to be more accountable to Boards of Governors.
- 37) Ensuring that female students have equality of opportunity.
- 38) Encouraging female staff to take administrative jobs and ensuring that they have equality of opportunity.
- 39) Boosting the status of outdoor education, music, art and other cultural experiences.
- 40) Examination-orientated education versus job-orientated education.
- 41) Educating for self-actualisation.
- 42) Ensuring that we do not lose our present assets in attempts to make further gains.

Referring to Table 7, the items listed as the challenges facing school administrators during the remainder of this decade could be broadly divided into six categories. These categories represented a further refinement of the eight categories derived during the Round One analysis.

The first category of challenges related to 'Staffing Practices and Issues', such as the need to improve staff professional competency. This included 18 items numbered 3), 6) to 8), 11) to 18), 20) to 22), 38), 39) and 42).

Another category of response was that related to 'Students' Needs' (see item Nos. 1), 2), 4), 5), 34), 35) and 41) in Table 7). Here, the emphasis was placed on issues such as training for effective use of leisure time and developing attitudes for life-long education.

The challenges linking the functioning of 'School and Community' formed another broad group. Item Nos. 19), 23), 24), 31) to 33) and 36) were classified under this category and reflected the school's need to account to the different sectors of the community and the community's awareness of certain responsibilities towards the school.

Item Nos. 9), 10) and 37), concerning multiculturalism and the provision of equal educational opportunity, were categorised as 'Equality of Opportunity'.

Those challenges emphasising the new technologies and the use of available resources in schools were reflected in items numbered 25), 26), 27) and 28), and were categorised as 'Technology and Resources'.

Item Nos. 29), 30) and 40), on 'Student Evaluation', focused on the School Certificate (S.C.) and University Entrance (U.E.)

examinations and the orientation of education towards examinations versus employment training.

In summary, the six categories of challenges derived from the Round Two analysis were: Staffing Practices and Issues (S); Students' Needs (SN); School and Community (SC); Equality of Opportunity (E); Technology and Resources (T); and Student Evaluation (SE). Table 8 on the following page lists these categories and their respective items. It can be seen that the 18 items relating to 'Staffing Practices and Issues' made up the prominent category. Both the 'Students' Needs' and 'School and Community' categories, consisting of seven items each, were the next largest group of items.

As well as categorising the items in the way described above, a frequency count was taken of the number of respondents who mentioned each item in Round Two, and the results are shown in Table 9. It is interesting to note from this Table that of the 42 items listed, 39 received a mention by two or more respondents and, in the case of the first seven items, 10 or more respondents mentioned each item in their Round Two replies.

A further breakdown of the results shown in Table 9 indicated that of the first 21 items, the majority of those items categorised as the 'Students' Needs' and the 'School and Community' were listed. In each case, five of the seven items for each of these categories appeared, this suggesting the relatively high priority given to both these categories of items by the respondents.

Overall, then, the analysis of Round Two results indicated that:

- (i) the most prominent set of challenges facing school administrators during the remainder of this decade concerns 'Staffing Practices and Issues';
- (ii) 'providing relevant and meaningful education to reflect

Categories	Challenges
1) <u>Staffing</u> <u>Practices</u> <u>and</u> <u>Issues (S)</u>	Curriculum review - core and non-core. Ensuring greater freedom of choice in materials being used in class. Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government. Falling rolls and management of contraction. Immobile and aging staff. Staff stress. Coping with inadequate and incompetent staff. Improving staff professional competency through training. Untrained school administrators and teaching staff. Providing staff with a sense of purpose, self-worth and achievement. Coping with non-dynamic/unmotivated and non-professional staff. Allowing and providing opportunity for teacher experimentation, adaptation, research and discussion. Breaking traditional hierarchies of responsibilities to provide new experiences in the profession. Restricted promotion prospects. Achieving less bureaucracy in schools. Encouraging female staff to take administrative jobs and ensuring that they have equality of opportunity. Boosting the status of outdoor education, music, art and other cultural experiences. Ensuring that we do not lose our present assets in attempts to make further gains.
2) <u>Students'</u> <u>Needs (SN)</u>	Catering for students who face unemployment. Training for adequate and fulfilling use of leisure time. Broadening the range of subjects in school. Teaching students to have flexible attitudes and versatile skills. Developing attitudes for life-long education. Meeting the needs and developing greater provision for the gifted, the reluctant and the less able students. Educating for self-actualisation.
3) <u>School</u> <u>and</u> <u>Community</u> <u>(SC)</u>	Providing a balance between satisfying the school and community demands and maintaining freedom for teachers and administrators to develop the well-being, initiative and creativity of students. Arousing parents' awareness of child-care responsibilities. Dealing with a more informed and more critical community. Promoting public and political awareness to ensure the maintenance and development of educational institutions. Maintaining school's function despite pressures from various groups. Coping with social changes and social pressures. Coping with pressure to be more accountable to Boards of Governors.
4) <u>Equality</u> <u>of</u> <u>Opportunity</u> <u>(E)</u>	Developing further the concept of equal educational opportunity. Multiculturalism in community, school and classroom. Ensuring that female students have equality of opportunity.
5) <u>Technology</u> <u>and</u> <u>Resources</u> <u>(T)</u>	Preparing students to adapt to new technologies. Adopting the computer as an education and administrative tool. Balancing the emphasis on technology with cultural awareness. Making the most efficient use of resources available.
6) <u>Student</u> <u>Evaluation</u> <u>(SE)</u>	Removing University Entrance examination (U.E.). Developing Form Six Certificate Courses (S.C.) Examination-orientated education versus job-orientated education.

Table 9: The Frequency Of Mention For Round Two Results

<u>Frequency</u>	<u>%</u>	<u>Challenges</u>	<u>Categories for each item</u>				
17	59	Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.	S	4	14	Allowing and providing opportunity for teacher experimentation, adaptation, research and discussion.	S
17	59	Catering for students who face unemployment.	SN	4	14	Ensuring that female students have equality of opportunity.	E
13	45	Improving staff professional competency through training, closer supervision and collegial support.	S	4	14	Making the most efficient use of resources available.	T
11	38	Training for adequate and fulfilling use of leisure time.	SN	4	14	Developing Form Six Certificate Courses	SE
11	36	Multiculturalism in community, school and classroom.	E	4	14	Balancing the emphasis on technology with cultural awareness.	T
11	38	Falling rolls and management of contraction.	S	4	14	Coping with non-dynamic and non-professional staff.	S
10	35	Teaching students to have flexible attitudes and versatile skills.	SN	4	14	Adopting the computer as an educational and administrative tool.	T
9	31	Developing further the concept of equal opportunity.	E	4	14	Immobile and aging staff.	S
9	31	Preparing students to adapt to new technologies.	T	3	10	Broadening the range of subjects in school.	SN
9	31	Maintaining school's function despite pressures from various groups.	SC	3	10	Untrained school administrators and teaching staff.	S
7	24	Coping with social changes and social pressures.	SC	3	10	Achieving less bureaucracy in schools.	S
7	24	Promoting public and political awareness to ensure the maintenance and development of educational institutions.	SC	3	10	Ensuring greater freedom of choice in materials being used in class.	S
6	21	Providing staff with a sense of purpose, self-worth and achievement.	S	3	10	Coping with pressure to be more accountable to Boards of Governors.	SC
6	21	Developing attitudes for life-long education.	SN	2	7	Providing a balance between satisfying the school and community demands and maintaining freedom for teachers and administrators to develop the well-being, initiative and creativity of students.	SC
6	21	Curriculum review, core and non-core.	S	2	7	Restricted promotion prospects.	S
6	21	Staff stress	S	2	7	Breaking traditional hierarchies of responsibilities to provide new experiences in the profession.	S
6	21	Arousing parents' awareness of child-care responsibilities.	SC	2	7	Examination-orientated versus job-orientated education.	SE
6	21	Removing U.E.	SE	2	7	Examining for self-actualisation.	SN
5	17	Encouraging female staff to take up administrative jobs and ensuring that they have equality of opportunity.	S	1	3	Boosting the status of outdoor education, music, art, and other cultural experiences.	S
5	17	Dealing with a more informed and more critical community.	SC	1	3	Ensuring that we do not lose our present assets in attempts to make further gains.	S
4	14	Meeting the needs and develop greater provisions for the gifted, the reluctant and the less able students.	SN	1	3		

the needs of students, community, society, economy and government', along with 'catering for students who face unemployment' were the only two items to be mentioned by half or more of the participants during Round Two and (iii) relatively high priority is accorded by participants to those items categorised as 'Students' Needs' and 'School and Community' when the frequency of mention of the first 21 items is considered.

### ROUND THREE RESULTS

In this round, the new summary list of the respondents' Round Two comments, with a total of 42 items, was fed back to the panel. The respondents were directed to consider the new summary list and then to reconsider and express their opinions about the challenges facing school administrators during the remainder of this decade, by indicating the relative importance of each 'challenge' item on the 5-point Likert-type scale provided. The scale was coded as follows: Extremely Important (5); Very Important (4); Of Some Importance (3); Of Little Importance (2); and Of No Importance (1) (see Round Three in Appendix D).

Following the return of the responses, the Mean and Standard Deviation for each of the 42 items was computed. (For an example, refer to Appendix F.) When this was completed, the items were ranked from the highest to the lowest Mean, and if items had the same Mean the one with the lowest Standard Deviation (i.e. the highest consensus) was ranked the highest (see Chapter Two, p. 36).

Table 10 shows the ranking of the Round Three results according to the computation of their Means and Standard Deviations. On almost all the items, the Mean was greater than three, thus suggesting that

**Table 10: Round Three Results With Mean And Standard Deviation And Categories**

The challenges facing school administrators during the remainder of this decade are, in order of importance:-		Scale Used		Rank	Challenges and Categories ( )	Mean	Standard Deviation	Rank	Challenges and Categories ( )	Mean	Standard Deviation
		5 - Extremely Important	4 - Very Important								
1	Improving staff professional competency and development through training, closer supervision & collegial support. (S)	4.33	0.6202	20	Making the most efficient use of resources available. (T)	3.63	0.7917	21	Developing Form 6 Certificate Courses. (SE)	3.59	0.9306
2	Providing relevant and meaningful education to reflect the needs of students, community, society, economy & government (S)	4.27	0.8744	22	Balancing the emphasis on technology with cultural awareness. (T)	3.56	0.9740	23	Promoting public & political awareness to ensure the maintenance & development of education institutions. (SC)	3.56	1.0500
3	Providing staff with a sense of purpose, self worth & achievement. (S)	4.22	0.8473	24	Encouraging female staff to take up administrative jobs & ensuring that they have equality of opportunity. (S)	3.56	1.0860	25	Coping with inadequate and incompetent staff. (S)	3.48	0.7530
4	Providing a balance between satisfying the school & community demands, and maintaining freedom for teachers & administrators to develop the well-being, initiative & creativity of students. (SC)	4.04	0.6077	26	Boosting the status of outdoor education, music, art, and other cultural experiences. (S)	3.44	0.8473	27	Broadening the ranges of subjects in school. (SN)	3.41	0.8984
= 5	Teaching students to have flexible attitudes & versatile skills. (SN)	4.04	0.8540	28	Coping with non-dynamic/unmotivated & non-professional staff. (S)	3.41	1.0099	29	Restricted promotion prospects. (S)	3.37	0.7917
= 5	Developing attitudes for life-long education. (SN)	4.04	0.8540	30	Untrained school administrators and teaching staff. (S)	3.35	1.0175	31	Breaking traditional hierarchies of responsibilities so as to provide new experiences in the profession. (S)	3.33	1.1094
7	Developing further the concept of equal educational opportunity. (E)	4.04	0.8979	32	Adopting the computer as an educational & administrative tool. (T)	3.30	0.7753	33	Maintaining the school's function despite pressure from various groups. (SC)	3.27	0.8744
8	Catering for students who face unemployment. (SN)	4.00	0.6794	34	Arousing parents' awareness of child-care responsibilities. (SC)	3.26	0.9443	35	Dealing with a more informed & more critical community. (SC)	3.19	0.7494
9	Meeting the needs of & developing greater provisions for, the gifted, the reluctant & the less able students. (SN)	3.89	0.8006	36	Achieving less bureaucracy in schools. (S)	3.15	1.0635	37	Removing U.E. (SE)	3.11	1.2195
10	Preparing students to adapt to new technologies. (T)	3.85	0.6624	38	Immobile and aging staff. (S)	2.93	0.6752	39	Examination-orientated education versus job-orientated education. (SE)	2.92	0.7961
= 11	Training for adequate and fulfilling use of leisure time. (SN)	3.85	0.7181	40	Ensuring greater freedom of choice in materials being used in class. (S)	2.88	0.9519	41	Ensuring that we do not lose our present assets in attempts to make further gains. (S)	2.85	0.8640
= 11	Curriculum review - core & non-core. (S)	3.85	0.7181	42	Coping with the pressures to be more	2.67	0.8771				
13	Multi-culturalism in community, school and classroom. (E)	3.85	0.8640								
14	Educating for self-actualization. (SN)	3.78	0.9740								
15	Staff stress. (S)	3.74	0.9027								
16	Coping with social changes & social pressures. (SC)	3.74	0.8130								
17	Allowing and providing opportunity for teacher experimentation, adaptation, research & discussion. (S)	3.74	0.8590								
18	Ensuring that female students have equality of opportunity. (E)	3.70	0.9533								
19	Ensuring that male students have equality of opportunity. (S)	3.67	0.7228								

at least some importance was attributed by the respondents to each of the challenges listed. Moreover, the Standard Deviation calculations indicated that on most of the items there was tight consensus of opinion. Using the six general categories of items derived from the Round Two analysis, it can be seen from Table 10 that items relating to the 'Staffing Practices and Issues' occupied the top three rankings, and that four challenges categorised as 'Students' Needs' appeared within the first 10 highest ranked items.

On closer scrutiny, it seems logical that the challenge of 'improving staff professional competency and development through training, closer supervision and collegial support' was ranked highest because without the competency of school administrative staff, most of the challenges listed, such as the provision of relevant and meaningful education, the inculcation of flexible attitudes and versatile skills in students, the preparation of students for new technologies, and so on, could not be met.

Generally, the trend which is most evident in Table 10 relates to the importance of school administrative staff improving their professional competency so as to meet more effectively the needs of the students as individuals, as members of society, and the demands of the community and society. This trend concurs with that postulated by Renwick (1983) who also suggests that one of the most important challenges facing school administrators is the issue of school administrative staff professional competency. In a recent publication, Renwick stresses the need for school administrators to be professionally assessed so they can know their own level of competency and improve on it. He also comments that in this and the following decades, the issue of accountability will very much be related to professional competency amongst school

administrators.

These sentiments have also been expressed by Culbertson, who has been Executive Director of the University Council for Educational Administration (UCEA) for the past 22 years. In a recent interview (see Podemski, 1982) Culbertson outlined what he felt were the future challenges facing school administrators and, in summary form, he listed the following:

- 1) In the recruitment and selection of educational administrative staff, there will be a pressing challenge to seek and attract the very best of societal leaders in education. Therefore educational administrators will need to improve their professional competency as they will be viewed in terms of their specific skills and vision of the future.
- 2) During the 1950s and 1960s, there was a great need of various school staff as the number of schools and educational institutions grew. In the 1970s, there was a shift to fewer students. Therefore educational administrators need to be able to cope with 'the management of decline'.
- 3) Administrative staff need skill in anticipation and management of the future.
- 4) There is a decrease in resources, thus leading to an increased competition of resources.
- 5) Accountability to parents and the community.
- 6) Increased need for computer literacy.
- 7) The need to develop better balance between and among purposes, programs and administrative processes.
- 8) Competition between the private and the public schools.
- 9) The needs for greater interpersonal and political skills and an ability to articulate the purposes of education during periods of ferment and change.

The general concurrence between Culbertson's challenges and those listed in Table 10 lend support to the outcomes derived from this Delphi study.

## CONCLUSION

In this chapter the results from each of the three rounds of this Delphi study have been outlined and discussed. The major categories of items, along with information on the items' frequency of mention, and their eventual ranking of importance, have been the focus of attention. Overall, items relating to 'Staffing Practices and Issues' were most prominent amongst the challenges facing school administrators during the remainder of this decade, with the most important challenge being to 'improve staff professional competency and development through training, closer supervision and collegial support'.

The final chapter of this thesis will discuss the potential of the Delphi Technique for school administrators.

CHAPTER FOUR

THE POTENTIAL OF THE DELPHI TECHNIQUE

## INTRODUCTION

In Chapter One of this thesis discussion centred on the Delphi Technique - the technique's history and development, its process and characteristics, its advantages and disadvantages, variations and general applications of Delphi, plus its specific uses in education. The chapter concluded with the rationale and objectives for the present study. These objectives were:

- a) to ascertain the challenges facing school administrators during the remainder of this decade, using the Delphi Technique; and
- b) to evaluate the potential of the Delphi Technique for school administrators.

Chapter Two presented the research design of the project. Here, discussion focused on the framework, the selection of the sample, the specific Delphi procedure used, and the follow-up evaluation.

Chapter Three presented the results obtained from the three rounds of this Delphi exercise and this was followed by the analysis and discussion of these results.

This final chapter will present the results of the follow-up evaluation and, in so doing, will explore the potential of the Delphi Technique for school administrators. Methodological issues relating to Delphi that emerged during this investigation will be discussed in this chapter. These issues are: the selection of the panel; the character of Round One; the editing of the rounds; the timing of each round; the group consensus; and the administrative burden on the controller of a Delphi study.

## THE FOLLOW-UP EVALUATION AND RESULTS

For the follow-up evaluation, the 27 respondents who returned Round Three questionnaires were sent a covering letter, a summary analysis of Round Three results, and a Follow-Up Evaluation Questionnaire (see Appendix E). In the light of the respondents' experience in the first three rounds of this Delphi project and the feedback information, they were asked to respond briefly to six open-ended questions. Twenty (74.1%) respondents returned their completed questionnaires. The results and analysis to each question are shown below and, in several instances, reference is made to items and rankings in Table 10, on page 53.

Question 1: To what degree do you concur with these results?

Eighteen (90%) respondents commented that they concurred completely or to a large extent with the group's responses. Some of their comments were:

- "I agree with the results; they reflect my own priorities with few exceptions."
- "I agree with most of the results."
- "High to medium degree of agreement."

On the basis of these types of comments it would seem that the Delphi Technique did act as a consensus-generating tool in this project, thus confirming the conclusion made by both Helmer (1966) and Uhl (1971) that convergence of opinion occurs in most cases when the Delphi Technique is employed.

Nevertheless, of those respondents who were generally in agreement with the group's consensus, three questioned whether the high ranking of item No. 1, in Table 10 - "Improving staff professional competency and development through training, closer supervision

and collegial support" - might have been influenced by the emphasis placed upon the concept of 'Instructional Leadership' in their current Diploma of Educational Administration course. These three respondents briefly elaborated on their views:

- "We have probably rated item No. 1 first because of our studies in Diploma of Educational Administration."
- "I agree very largely with the results except for No. 1 which I feel is an artificial result engendered by the heavy propaganda for instructional leadership currently being studied by members of the group."
- "I concur with the results but did not realise that instructional leadership would appear so strong."

Six respondents also questioned the ranking priority of a few lowly rated items. They commented that generally they did agree with the items at the top end of the ranking but felt other items deserved higher ranks.

In summary, responses to the first question of the Follow-Up Evaluation seemed to indicate a general agreement on the Round Three listing and ranking of challenges facing school administrators during the remainder of this decade, although this evaluation did show that a minority of participants questioned the ranking of a few items.

Question 2: To what extent have your views about the future challenges facing school administrators changed during the course of this study?

All the respondents maintained that during this study their views concerning the future challenges facing school administrators had probably changed very little. However, 12 of them admitted that

the group's summary feedback of information did broaden their perspective to accommodate others' viewpoints and priorities. Below are some examples of their comments in response to the above question:

- "My views have changed very little, although the feedback has made me more aware of the priorities of others."
- "My views have not altered considerably although I may have incorporated some of the group's views into my own."
- "No general change to my views though they broadened because of feedback."
- "My views have broadened through being exposed to the ideas of a larger group."

These comments corroborate, to some extent, the findings of McGaw et al. (1976) and Dalkey (1969), that the pooling of opinions through Delphi does broaden the range of views available to respondents.

Question 3: As a participant, what were the main problems you faced in responding to the three questionnaires?

Only two (10%) panel members stated that they had no problems at all. The remainder admitted facing some problems and their reasons for this can be grouped into four categories. The first category consisted of two respondents who had problems in Round One. One commented that he did not know how much to say in the first round, and the other found Round One overly demanding and suggested that rephrasing the question with more specific instructions may have assisted.

Four other participants found it difficult either (i) to decipher subtle differences in the meanings and implications of some items;

(ii) to make concise statements; or (iii) to assess the relative importance of every item. Moreover, it was pointed out by one of these participants that because some of the items seemed to overlap, it was difficult to 'dissect' them into succinct statements and to evaluate their relative importance.

The third group, comprising four respondents, thought that time pressure was their main problem when responding to the three questionnaires. The following comment reflects this:

- "The problem was getting time to read the questionnaires and then trying to post them back on time."

And the fourth category of problems, incorporating the views of seven participants, indicated that involvement in the administration of their own schools had narrowed their views concerning the challenges facing school administrators in general. As a result, they found difficulties in finalising their responses when presented with the wide range of the group's opinions. For instance:

- "I had a problem in ensuring that I gained adequate understanding and realisation of problems facing areas of education other than those in which I work and, therefore, responding from an 'equivalent' base of knowledge and concern."

In summary, the four problematic areas the participants found in responding to the three questionnaires were: (i) the imprecision of the first round; (ii) the subtle differences in the meanings and implications of items; (iii) the interval between questionnaires; and (iv) the diversity of the group's opinions.

Question 4: From your participation in this study, what do you see as some of the advantages and disadvantages of the Delphi Technique?

As the participants worked through the three rounds of this Delphi project it was felt they would note some of the advantages and disadvantages of the Delphi Technique. Table 11, on the following page, shows the 'pros' and 'cons' they listed.

Many of the advantages outlined by participants confirm the claims of earlier studies relating to the advantages of the Delphi Technique. For example, advantage Nos. 2, 6 and 11 concerning the achievement of consensus add further confirmation to Helmer's (1966) and Uhl's (1971) conclusions that convergence of opinion on the solution of a particular problem is one of the resultant benefits from using the Delphi Technique.

Those advantages relating to controlled feedback of information (Nos. 3, 4 and 15) seem to strengthen the claims of Dalkey (1969) that feedback procedures enhance the accuracy of a group of people's views, opinions and estimates. It was Dalkey (1963) who also stated that the Delphi Technique avoids many of the disadvantages common with people communicating as a group in face-to-face interaction.

Advantage Nos. 1 and 12 suggest that with the application of Delphi, a wide range of opinions could be elicited from a group of people from a wide geographical area without them meeting. The implication here is that, for school administrators, this may avoid some of the inconveniences of face-to-face meetings (see No. 5) and perhaps give more credence and legitimacy to the views of individuals (see Nos. 13 and 14).

When considering the disadvantages of Delphi listed in Table 11 it

Table 11: The 'Pros' And 'Cons' Of Delphi As Noted By The Panel

<u>Advantages</u>	<u>Disadvantages</u>
1) Exposed to a wide range of ideas from a wide geographical area.	1) Large responses --specific to non-specific. Some items are very general, vague, idealistic and overlapping, therefore difficult in ranking task.
2) Not very time-consuming, can focus on important consensus quickly.	2) Time-consuming and therefore needs more time allowance.
3) Opportunity for all views as there is the possibility of amending responses with more feedback information.	3) Large range of responses--your ideas covered by others.
4) The depth of responses increased at different levels of confirmation through feedbacks.	4) The frequency with which the questionnaires appear tends to become a little irritating.
5) Avoid interpersonal conflict of meeting.	5) Danger of conforming to group's ideas.
6) Crystallises or identifies areas of major concern.	6) Strong individually-held views are watered down by group's size.
7) A sense of development.	7) Open to manipulation possibly by those running the technique to get the results they want.
8) Unbiased and freedom of opinion in the first round.	8) Need some understanding of the aims of survey.
9) Good way of canvassing opinions which disallow prompting or consultation beforehand (anonymous response).	9) Isolation of respondents.
10) Useful tool for gaining a perspective of how administrators view their futures and problems in the educational system.	10) Fails to provide real consensus.
11) Useful process for achieving consensus on priorities.	11) Not sure how final consensus arrived at statistically.
12) Get opinions of a group without meeting.	12) Researcher might not have interpreted your meaning as you intended, rephrasing responses can alter their underlying meaning and implications.
13) An element of taking increased responsibility for one's responses.	13) List is too long, not enough refinement.
14) One's concerns are legitimised further.	14) Tend to be black and white, no shades of grey.
15) Probably pretty reliable because of repetitions	15) No record of what was sent off.
	16) Narrow selection of subjects.

is important to realise that some of these might not be disadvantages per se. For example, disadvantage No. 3 refers to a common occurrence in Delphi studies because consensus implies that a participant's responses may be covered by others. The loss of the individuality of the response when consensus is being reached is probably being hinted at in this particular criticism. Disadvantage No. 9, which refers to the isolation of the respondents, is, in fact, often necessary in Delphi studies to ensure that anonymous, independent responses are received from participants.

On closer examination, disadvantage Nos. 8 and 11 are not related to the Delphi Technique itself but, rather, seem to identify shortcomings in administering the present study.

Other disadvantages listed in Table 11 can be grouped into methodological concerns. For instance, Nos. 2 and 4 are related to the pressure of time which sometimes can be easily eliminated by setting a longer time interval between questionnaires. Disadvantage No. 7 speculates about the unethical procedure of manipulating research to obtain desired outcomes, and this may be no more common with Delphi than with any other research technique. The subjectiveness of editing responses between rounds, indicated in Nos. 12 and 13, is a more acute problem in Delphi studies and is discussed later in this chapter.

Question 5: Prior to this study, have you ever participated in a Delphi Investigation?

All the participants who responded to this question stated that they had never participated in any Delphi Investigation before. This finding strengthens Schmuck's (1977) and Johnston's (1981) observations that the use of Delphi by school administrators

is still in its infancy.

Question 6: General comments.

Five respondents made no further comments in the evaluation questionnaire. However, 11 participants expressed their appreciation of being invited to cooperate in this study because the 'challenges' facing school administrators were a major concern to them. Below are some of their comments:

- "I was happy to help. It was interesting to see the results; to see what other people thought. It made me think about what was important. It provided a good 'working list' if I ever get to be an administrator with some influence."
- "It has been really interesting to think about challenges from my point of view, to see what others think and their new points of view, to have my points reiterated by others and feel I am not alone in my concerns."
- "I was glad to cooperate as it is very interesting to relate my priorities to other administration people."

Indeed, coming through these and the other comments was the view that this Delphi study provided a motivating environment for the participants to consider the challenges confronting school administrators, and the relatively low attrition rate during the three rounds partly reinforces this. It can be seen from Table 12 that only six of the original 33 participants dropped out.

Table 12: The Attrition Rates For The Sample

Questionnaires	Total No. & % of participants	No. & % of Returned Responses	No. & % of Dropouts
Round One	33 (100%)	30 (90.9%)	3 (9.1%)
Round Two	30 (100%)	29 (96.7%)	1 (3.3%)
Round Three	29 (100%)	27 (93.1%)	2 (6.9%)

Other general comments reiterated remarks which some respondents mentioned in response to previous questions. For instance, the overlap between some of the challenges was mentioned by one participant. And another questioned the underlying meanings and implications of some of the items.

In summary, this discussion of the Follow-Up Evaluation has shown that:

- 1) Ninety per cent of the respondents concurred with the outcomes from Round Three.
- 2) All the participants maintained that during the course of this study their views about the future 'challenges' facing school administrators probably changed very little, although some participants indicated that their perspectives had broadened by their involvement.
- 3) The four problematic areas they faced in responding to the three rounds of questionnaires were: the imprecision of the first round; the subtle differences in meanings and implications of some items; the short time-interval between the questionnaires; and the diversity of the group's opinions.
- 4) The panel identified a number of advantages and disadvantages in the Delphi Technique, as applied in this study, although it was noted that several of the disadvantages did not relate to the technique per se.
- 5) None of the respondents had participated in any Delphi Investigation before this study.
- 6) The low attrition rate amongst the respondents possibly reflected the increasing commitment they developed towards the study as each successive round progressed.

Overall, the tenor of the respondents' comments in this Follow-Up Evaluation indicated general support for the Delphi Technique as a potentially viable tool for school administrators. In order to further evaluate the usefulness of the Technique for school administrators, a discussion of the major methodological issues to emerge during this study will now follow.

### THE SIGNIFICANT METHODOLOGICAL ISSUES

During the course of this study several methodological issues arose. These related to the selection of the panel; the character of Round One; the editing of the rounds; the timing of rounds; the group's consensus; and the procedures involved in the administration of the Delphi Technique.

#### The Selection of the Panel

In any Delphi study the selection of a panel becomes a crucial methodological issue. Some Delphi investigations have selected panels of up to 1000 respondents in order to avoid what Judd (1972) refers to as the hazard of creating 'inbreeding', i.e. selecting people who would reflect a singular set of judgements on a particular issue or problem. However, Cyphert and Gant (1970) reported that associated with the selection of a large number of participants for a Delphi study is the attendant problem of attrition and, in turn, the remaining active participants not being broadly representative of the larger public that was sought. McGaw et al. (1976) also point out the problem of excessive administrative work involved with Delphi studies utilising extremely large samples of respondents.

Keeping in mind the above cautions about the use of large panels of respondents, both the objectives of this study dictated the selection of a sample comprising persons of experience and with a knowledge of current events in school administration in New Zealand. This consideration, along with the fact that this project was to be undertaken by one investigator, who lacked the finance, facilities and time to carry out an investigation using large numbers of respondents, necessitated the selection of a relatively small group of 40 New Zealand school administrators as the sample for the study.

Although this sample was statistically small, its members came from a wide geographical area of the North and South Islands of New Zealand and held various administrative positions at different levels of the school system. The participants consisted of both males and females whose ages ranged from 25 to 56. However, while the sample did seem to provide a representative cross-section of school administrators, caution should be attached to generalising the outcomes beyond the sample used.

#### The Character of Round One

The issue involving the character of Round One focuses on whether to use closed-ended statements or an open-ended approach in asking the panel to respond to the problem under investigation. In the closed-ended approach, participants usually choose their responses from a list of prepared statements, or they complete partly-structured phrases. Uhl (1971) and Peterson (1971) found that the closed-ended approach has the advantage of saving time since Round One responses do not have to be collated or edited. Nevertheless, a disadvantage of the closed-ended approach is the likelihood of omitting important statements and limiting the participants' freedom

in responding to the problem.

An open-ended approach was used in Round One of this Delphi exercise because it:

- 1) enabled a large range of opinions on the issue being explored to be elicited;
- 2) provided participants with the freedom to respond to the problem; and
- 3) avoided any bias towards a structured consensus.

Generally, most participants had few problems in responding to this open-ended Round One, with only one respondent reporting that this first round was demanding, and another commenting that there was uncertainty about how many responses were required. In this study, then, the open-ended approach was adjudged to be the most appropriate for Round One, although methodological problems involving the editing of responses did arise.

#### The Editing of Rounds

The choice of an open-ended format in Round One necessitated the editing of returns, which were often handwritten. In this case, the magnitude of the editing process following an open-ended first round was much greater than realised. Judd (1972, p.183) aptly states the dilemma facing the Delphi editors:

"The situation is not unlike the problem of whether to use a butcher knife or a scalpel in trimming the responses to a portion that can be served up in Round Two."

Using the editing procedure adopted in Rounds One and Two of this study (see Chapter Two), the investigator found the process trying and tiring. For instance, in Round One, the investigator had to edit 136 statements. It took a total of 38 hours to arrive at the

summary list of 34 items, and while every attempt was made to be systematic in this editing process it could be regarded as being highly subjective.

Given resources and facilities, the fatigue problem and the subjective nature in editing Delphi replies can be overcome. For instance, Huckfeldt (1972) suggested that editing should be undertaken by a professional staff possessing expertise in language and communication. To avoid fatigue, says Huckfeldt, they should have secretarial backup and the necessary technical equipment (e.g. computers) for screening and coding responses. Moreover, according to Huckfeldt, there should be 'quality control checks' to test the level of agreement amongst the editing staff.

#### The Timing of Rounds

There is little research data on the effect of the duration of the time-interval between the rounds in Delphi studies, or the time given respondents to complete each round. However, in this present study it was found that the length of the time-interval is an important methodological consideration. In all the rounds, most of the respondents returned their completed questionnaires within the stipulated time. Nevertheless, in the Follow-Up Evaluation it was revealed that two-thirds of the panel found 'the time pressure' a main problem in this exercise.

However, it was realised from the Follow-Up Evaluation that more cognisance should have been taken of the hectic schedules of some of the participants and allowances made accordingly concerning their returns.

### The Group's Consensus

One of the most crucial issues relating to the use of the Delphi Technique is whether the final consensus is genuine or specious. Specious consensus, according to Welty (1970), Sandow (1971), and Sackman (1974), usually occurs when respondents are fed back statistical summaries of the group response in the second round, thus forcing them to converge towards the median response in the second and subsequent rounds. In the present study, however, statistical feedback of the group's responses did not occur until the study was completed. Moreover, data from the Follow-Up Evaluation seemed to suggest that the consensus of opinion on the challenges facing school administrators was authentic rather than specious.

### The Administration of the Delphi Technique

In the application of the Delphi Technique there is the reported danger that those in charge can administer the technique to obtain the desired results. This issue, which was mentioned in the Follow-Up Evaluation, is discussed by Welty (1971, p.377) who claims that:

"The Delphi manager may deliberately misrepresent the outcome of one Delphi round to the participating expert in the next round, in an attempt to influence the outcome of the entire exercise."

In this Delphi study the use of an open-ended first round and returning both the respondents' own replies and the summaries of the group response during successive rounds would have acted against any deliberate attempts to misrepresent the outcomes. Furthermore, the nonstatistical feedback of information for Rounds Two and Three did not provide the participants with any median answer, specious or otherwise, to converge towards.

Methodologically, the issue raised by Welty about the Delphi investigator being able to influence the outcome of an exercise raises some interesting questions about the feedback of information during the rounds and, in particular, about the effects of feeding back false or misleading data. Further studies to determine whether respondents are susceptible to such deception are recommended.

So far in this chapter, the results of the Follow-Up Evaluation and methodological issues concerning Delphi have been discussed. In the final part of this chapter the potential of the Delphi Technique for school administrators will be considered briefly.

#### THE POTENTIAL OF THE DELPHI TECHNIQUE FOR SCHOOL ADMINISTRATORS

In school administration, goals and decisions are often based on opinions and beliefs and, because of this, it seems important that school administrators have access to reliable research tools to help them tap these opinions and beliefs, especially in relation to issues where there is likely to be a lack of consensus.

Although many school administrators are already familiar with conventional methods of information-gathering (e.g. one-shot surveys), it is likely they will turn to new and innovative techniques, such as the Delphi Technique.

On the basis of this study, school administrators may find a number of advantages in using the Delphi Technique. The technique can generate consensus on issues where there is a lack of agreement. It can elicit opinions from a group of people without them having to meet face-to-face. Due to this anonymity, respondents

have an equal opportunity to affect decision-making because group pressure to conform and the influence of dominant individuals is minimised. Moreover, the reiterative nature of the technique, where respondents can reconsider their previous opinions, acts against the hasty formulations of preconceived notions. And, with the application of Delphi, respondent attrition rates are often low.

At the same time, however, the users of Delphi should be cautioned about possible disadvantages of the technique which have been identified in this study. These include: the editing of open-ended responses where the magnitude of the editing process can be demanding; the timing of the rounds, which can impose undue constraints on respondents; and the administrative burden that an investigator may have to cope with in carrying out a Delphi study.

Overall, Delphi does appear to be a potentially viable tool for school administrators and, in particular, it may be useful to them in areas such as curriculum planning, developing goals and objectives, and arriving at consensus on budgeting allocations.

### CONCLUSION

From the results of the present study, and on the basis of other Delphi investigations, the Delphi Technique can be recommended as a tool for school administrators. However, as Pill (1971) has pointed out, the value of Delphi will be enhanced when it is used alongside other conventional tools which are constantly utilised to solve the wide range of problems which inevitably confront school administrators.

## CONCLUSION

This study has investigated an application of the Delphi Technique in school administration with a view to evaluating its potential for school administrators.

The results from the three rounds of questionnaires indicated that consensus amongst the sample of respondents was achieved in relation to challenges facing school administrators during the remainder of this decade. In particular, 'Staffing Practices and Issues' was the most prominent category of challenges listed by the respondents, with the need to "improve staff professional competency and development through training, closer supervision and collegial support" being ranked as the most important of all the challenges.

In the Follow-Up Evaluation, most of the participants indicated general support for the Delphi Technique as a potentially viable tool for school administrators. This same conclusion was arrived at after considering the significant methodological issues concerning Delphi that arose during the course of this study.

Overall, the findings from this study seem to confirm some of the reported advantages Delphi has over round-table discussions and face-to-face meetings. The response anonymity feature appeared to allow respondents freedom to define, reconsider and refine their opinions without fear of causing confrontation or having to conform to the opinions of others. Moreover, the low attrition rate, which has also been reported in other studies, suggests participants develop enthusiasm and commitment in a Delphi project.

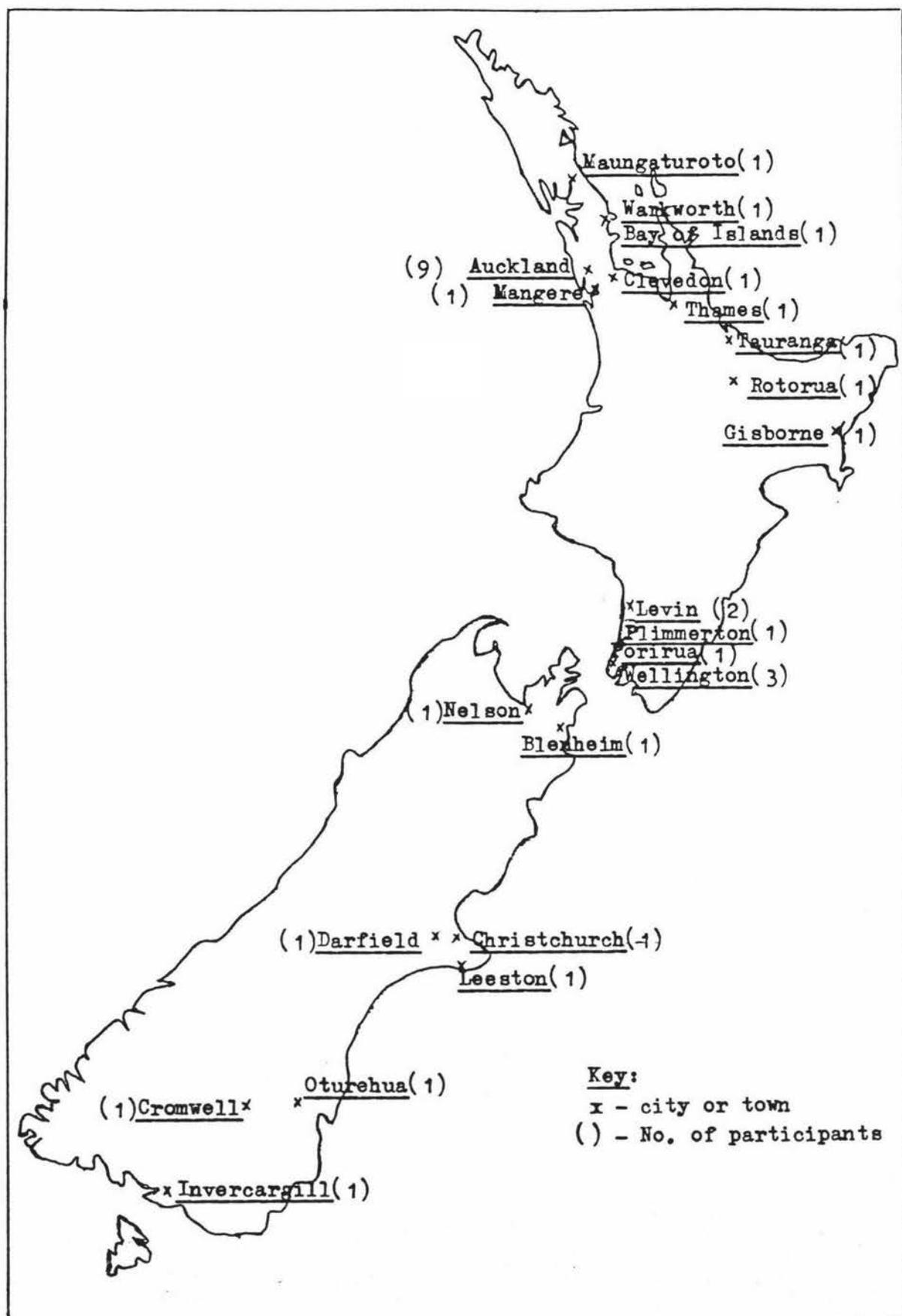
Although Delphi still remains virtually unknown amongst school administrators, it can be suggested, on the basis of this study, that it may be a potentially useful tool to help generate consensus of opinion, particularly where there is lack of agreement, such as in defining goals and objectives, and in developing budgeting priorities.

## A P P E N D I C E S

APPENDIX A

THE LOCATION OF PARTICIPANTS

THE LOCATION OF PARTICIPANTS



APPENDIX B

ROUND ONE LETTER AND QUESTIONNAIRE

# Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES: 69-079, 69-089, 69-099

In reply, please quote:

Education Department

18 May 1984

Dear Colleague,

It was a great pleasure meeting you during the Vacation Course. Thank you very much for volunteering to participate in my research project.

This project will employ the Delphi Technique to elicit your opinions concerning the challenges facing school administrators during the remainder of this decade.

The Delphi used here involves four rounds of questionnaires. The first questionnaire is attached to this letter. The second, third and fourth questionnaires will be based on information gathered from the previous rounds. Because of this process, it is important that you return promptly your response to each round. It would be most convenient, therefore, if I could receive your response to Round One by 25 May. Round Two should be in your hands by about 5 June.

I would like to emphasise again that your identity and opinions in this study will be treated as strictly confidential.

If you have any queries, please do not hesitate to contact me. Thank you once again for your cooperation and participation in this study.

Yours sincerely,

Miss Heidi Lee,  
Postgraduate Student in Education,  
Massey University

Enclosed: Round One Questionnaire.

ROUND ONE

Please indicate your name and the forwarding address for the next round.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_

.....

THE PROBLEM

What do you see as the challenges facing school administrators during the remainder of this decade? Please list below your response(s) to this question.

APPENDIX C

ROUND TWO LETTER, QUESTIONNAIRE AND ROUND  
ONE SUMMARY LIST

# Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES: 69 079, 69 080, 69 099.

In repl. please quote

**Education Department**

**5 June 1984**

Dear Colleague,

Re: Delphi Study (Heidi Lee)

Thank you very much for returning Round One. Your responses were very interesting and much appreciated.

Enclosed is Round Two of this study, including a stamped-reply envelope. I would be grateful if you could return your responses to Round Two promptly. If I could receive your Round Two responses by 12 June, then Round Three should be in your hands by about 19 June.

Do feel free to contact me if there are any queries. Thank you again for your cooperation and participation in this study.

Yours sincerely,

Miss Heidi Lee,  
Postgraduate Student in Education,  
Massey University

Enclosed: Round Two Questionnaire and Round One Summary List

ROUND TWO

Please indicate your name and the forwarding address for the next round.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
 \_\_\_\_\_

.....

THE PROBLEM

In Round One, you were requested for your opinions on what do you see as the challenges facing school administrators during the remainder of this decade. Attached are your expressed views for Round One, and also a summary list of all the comments which you and your fellow participants in this study have made.

Keeping in mind all the comments you and your colleagues have made, please compile a short list of concise statements relating to what you see as the challenges facing school administrators during the remainder of this decade. You may wish to choose key statements from the summary list. You can also add to, delete from, modify or summarise the comments you gave in Round One.

I would be grateful if you could promptly return your Round One responses, with your opinions to this round, in the provided stamped-reply envelope.

### A SUMMARY LIST OF THE RESPONDENTS' ROUND ONE COMMENTS

The challenges facing school administrators during the remainder of this decade are:-

- 1) Catering for students who face unemployment.
- 2) Training for adequate and fulfilling use of leisure time.
- 3) Curriculum review - core and non-core.
- 4) Broadening the range of subjects in school.
- 5) Teaching students to have flexible attitudes and versatile skills.
- 6) Ensuring greater freedom of choice in materials being used in class.
- 7) Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.
- 8) Falling rolls and management of contraction.
- 9) Developing further the concept of equal educational opportunity.
- 10) Multi-culturalism in community, school and classroom.
- 11) Immobile and aging staff.
- 12) Staff stress.
- 13) Untrained school administrators and teaching staff.
- 14) Improving staff professional competency through further training, closer supervision and collegial support.
- 15) Providing staff with a sense of purpose and self worth.
- 16) Coping with non-dynamic and non-professional staff.
- 17) Allowing and providing opportunity for teacher experimentation, adaptation, research and discussion.
- 18) Breaking traditional hierarchies of responsibilities to provide new experiences in the profession.
- 19) Achieving less bureaucracy in schools.
- 20) Arousing parents' awareness of child-care responsibilities.
- 21) Dealing with a more informed and more critical community.
- 22) Adopting the computer as an educational and administrative tool.
- 23) Coping with the conflict in producing scientific-technologically able students versus culturally aware students.
- 24) Making the most efficient use of resources available.
- 25) Removing U.E.
- 26) Developing Form Six Certificate Courses.
- 27) Promoting public and political awareness to ensure the maintenance and development of educational institutions.
- 28) Maintaining school's function despite pressures from various groups.
- 29) Coping with social changes and social pressures.
- 30) Developing attitudes for life-long education.
- 31) Meeting the needs of the gifted and less able students.
- 32) Coping with pressure to be more accountable to Boards of Governors.
- 33) Ensuring that female students and female staff have equality of opportunity.
- 34) Making students aware of the place of Christianity in an increasing secular society.

## APPENDIX D

ROUND THREE LETTER, QUESTIONNAIRE AND ROUND  
TWO SUMMARY LIST

# Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES: 69 079, 69 089, 69 114

In reply please quote

Education Department

25 June 1984

Dear Colleague,

Re: Delphi Study (Heidi Lee)

Thank you very much for returning Round Two of this Delphi Study. Your responses again were very interesting and much appreciated.

Enclosed is the final round together with a stamped-reply envelope. I would be grateful if you could return your responses to Round Three by 2 July.

When your responses are returned, I will analyse the data and send you a copy of the results for your comments with regards to this study.

I wish to express my sincere appreciation for your time and assistance in this project.

If you have any queries, please feel free to contact me.

Yours sincerely,

Miss Heidi Lee,  
Postgraduate Student in Education,  
Massey University

Enclosed: Round Three Questionnaire and Round Two Summary List

ROUND THREE

Please indicate your name and the forwarding address for the next round.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
 \_\_\_\_\_

.....

THE PROBLEM

In Round Two of this study you were asked to reconsider your Round One responses, in the light of your colleagues' comments, and to compile a short list of concise statements relating to what you see as the challenges facing school administrators during the remainder of this decade. Attached is a summary list of all the Round Two responses from you and your colleagues.

In this round, you are asked to consider the list of challenges on the following pages, and to express your opinions by indicating the relative importance of each item in relation to the challenges facing school administrators during the remainder of this decade.

## ROUND THREE QUESTIONNAIRE

Please express your opinion by indicating, with the scale provided, the relative importance of each item in relation to the challenges facing school administrators during the remainder of this decade:-

Items	Scale			
	Impt. Important			
	Extremely Impt.	Very Impt.	Some Impt.	Little Impt.
1) Catering for students who face unemployment.				
2) Training for adequate and fulfilling use of leisure time.				
3) Falling rolls and management of contraction.				
4) Curriculum review - core and non-core.				
5) Broadening the range of subjects in school.				
6) Teaching students to have flexible attitudes & versatile skills.				
7) Ensuring greater freedom of choice in materials being used in class.				
8) Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.				
9) Developing further the concept of equal educational opportunity.				
10) Multi-culturalism in community, school and classroom.				
11) Immobilis and aging staff.				
12) Staff stress.				
13) Coping with inadequate and incompetent staff.				
14) Improving staff professional competency and development through training, closer supervision & collegial support				
15) Untrained school administrators and teaching staff.				
16) Providing staff with a sense of purpose, self worth & achievement.				
17) Coping with non-dynamic/unmotivated & non-professional staff.				
18) Allowing & providing opportunity for teacher experimentation, adaptation, research & discussion				
19) Providing a balance between satisfying the school & community demands, and maintaining freedom for teachers & administrators to develop the well-being, initiative & creativity of students.				
20) Breaking traditional hierarchies of responsibilities so as to provide new experiences in the profession.				

21) Restricted promotion prospects.				
22) Achieving less bureaucracy in schools.				
23) Arousing parents' awareness of child-care responsibilities.				
24) Dealing with a more informed & more critical community.				
25) Preparing students to adapt to new technologies.				
26) Adopting the computer as an educational & administrative tool.				
27) Balancing the emphasis on technology with cultural awareness.				
28) Making the most efficient use of resources available.				
29) Removing U.E.				
30) Developing Form Six Certificate Courses.				
31) Promoting public & political awareness to ensure the maintenance & development of educational institutions.				
32) Maintaining the school's function despite pressure from various groups.				
33) Coping with social changes & social pressures.				
34) Developing attitudes for life-long education.				
35) Meeting the needs of & developing greater provisions for, the gifted, the reluctant & the less able students.				
36) Coping with the pressure to be more accountable to Board of Governors.				
37) Ensuring that female students have equality of opportunity.				
38) Encouraging female staff to take up administrative jobs & ensuring that they have equality of opportunity.				
39) Boosting the status of outdoor education, music, art, and other cultural experiences.				
40) Examination-orientated education versus job-orientated education.				
41) Educating for self-actualization.				
42) Ensuring that we do not lose our present assets in attempts to make further gains.				

## A SUMMARY LIST OF THE RESPONDENTS' ROUND TWO COMMENTS

The challenges facing school administrators during the remainder of this decade are:-

- 1) Catering for students who face unemployment.
- 2) Training for adequate and fulfilling use of leisure time.
- 3) Curriculum review - core and non-core.
- 4) Broadening the range of subjects in school.
- 5) Teaching students to have flexible attitudes and versatile skills.
- 6) Ensuring greater freedom of choice in materials being used in class.
- 7) Providing relevant and meaningful education to reflect the needs of students, community, society, economy and government.
- 8) Falling rolls and management of contraction.
- 9) Developing further the concept of equal educational opportunity.
- 10) Multi-culturalism in community, school and classroom.
- 11) Immobile and aging staff.
- 12) Staff stress.
- 13) Coping with inadequate and incompetent staff.
- 14) Improving staff professional competency through training.
- 15) Untrained school administrators and teaching staff.
- 16) Providing staff with a sense of purpose, self worth and achievement.
- 17) Coping with non-dynamic/unmotivated and non-professional staff.
- 18) Allowing and providing opportunity for teacher experimentation adaptation, research and discussion.
- 19) Providing a balance between satisfying the school and community demands and maintaining freedom for teachers and administrators to develop the well-being, initiative and creativity of students.
- 20) Breaking traditional hierarchies of responsibilities to provide new experiences in the profession.
- 21) Restricted promotion prospects.
- 22) Achieving less bureaucracy in schools.
- 23) Arousing parents' awareness of child-care responsibilities.
- 24) Dealing with a more informed and more critical community.
- 25) Preparing students to adapt to new technologies.
- 26) Adopting the computer as an educational and administrative tool.
- 27) Balancing the emphasis on technology with cultural awareness.
- 28) Making the most efficient use of resources available.
- 29) Removing U.E.
- 30) Developing Form Six Certificate Courses.
- 31) Promoting public and political awareness to ensure the maintenance and development of educational institutions.
- 32) Maintaining school's function despite pressures from various groups.
- 33) Coping with social changes and social pressures.
- 34) Developing attitudes for life-long education.
- 35) Meeting the needs and developing greater provision for the gifted, the reluctant and the less able students.
- 36) Coping with pressure to be more accountable to Boards of Governors.
- 37) Ensuring that female students have equality of opportunity.
- 38) Encouraging female staff to take administrative jobs and ensuring that they have equality of opportunity.
- 39) Boosting the status of outdoor education, music, art and other cultural experiences.
- 40) Examination-orientated education versus job-orientated education.
- 41) Educating for self-actualization.
- 42) Ensuring that we do not lose our present assets in attempts to make further gains.

APPENDIX E

FOLLOW-UP EVALUATION LETTER, QUESTIONNAIRE AND  
ROUND THREE RESULTS

# Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES: 69 079, 69 083, 69 099.

In reply please quote:

Education Department

20 July 1984

Dear Colleague,

Re: Delphi Study (Heidi Lee)

Thank you very much for returning Rounds One, Two and Three of this Delphi Study in which you have been involved. Your participation and responses were very much appreciated.

Enclosed is an analysis of the third round, together with a Follow-Up Respondent Evaluation Questionnaire and a stamped-reply envelope. I would be most grateful if you could respond to this final round with some urgency and return it by 27 July.

I take this opportunity to express my sincere gratitude to you for taking time off your busy schedule, in order to participate in this study. Thank you again for your valuable assistance.

Yours sincerely,

Miss Heidi Lee,  
Postgraduate Student in Education,  
Massey University

Enclosed: Follow-Up Questionnaire and Round Three Analysis.

FOLLOW-UP RESPONDENT EVALUATION QUESTIONNAIRE

Attached are the results from this Delphi Study.

In the light of your previous participation and the results, I would be grateful if you would respond briefly to the following questions:-

- 1) To what degree do you concur with these results?
  
- 2) To what extent have your views about the future challenges facing school administrators changed during the course of this study?
  
- 3) As a participant, what were the main problems you faced in responding to the three questionnaires?
  
- 4) From your participation in this study, what do you see as some of the advantages and disadvantages of the Delphi Technique?

Advantages:-

Disadvantages:-

- 5) Prior to this study, have you ever participated in a Delphi Investigation?

Yes

No

- 6) General comments:-

## ROUND THREE RESULTS

The challenges facing school administrators during the remainder of this decade are, in order of importance:-

Scale used  
5 - Extremely Important  
4 - Very Important  
3 - Some Importance  
2 - Little Importance  
1 - No Importance

<u>Rank</u>	<u>Challenges</u>	<u>Mean</u>	<u>Standard Deviation</u>
1	Improving staff professional competency and development through training, closer supervision & collegial support.	4.33	0.6202
2	Providing relevant and meaningful education to reflect the needs of students, community, society, economy & government.	4.27	0.8744
3	Providing staff with a sense of purpose, self worth & achievement.	4.22	0.8473
4	Providing a balance between satisfying the school & community demands, and maintaining freedom for teachers & administrators to develop the well-being, initiative & creativity of students.	4.04	0.8077
- 5	Teaching students to have flexible attitudes & versatile skills.	4.04	0.8540
- 5	Developing attitudes for life-long education.	4.04	0.8540
7	Developing further the concept of equal educational opportunity.	4.04	0.8979
8	Catering for students who face unemployment.	4.00	0.6794
9	Meeting the needs of & developing greater provisions for, the gifted, the reluctant & the less able students.	3.89	0.8006
10	Preparing students to adapt to new technologies.	3.85	0.6624
- 11	Training for adequate and fulfilling use of leisure time.	3.85	0.7181
- 11	Curriculum review - core & non-core.	3.85	0.7181
13	Multi-culturalism in community, school and classroom.	3.85	0.8640
14	Educating for self-actualization.	3.78	0.9740
15	Staff stress.	3.74	0.9027
16	Coping with social changes & social pressures.	3.74	0.8130
17	Allowing and providing opportunity for teacher experimentation, adaptation, research & discussion.	3.74	0.8590
18	Ensuring that female students have equality of opportunity.	3.70	0.9533
19	Falling rolls and management of contraction.	3.67	0.7338
20	Making the most efficient use of resources available.	3.63	0.7917
21	Developing Form Six Certificate Courses.	3.59	0.9306
22	Balancing the emphasis on technology with cultural awareness.	3.56	0.9740
23	Promoting public & political awareness to ensure the maintenance & development of education institutions.	3.56	1.0500
24	Encouraging female staff to take up administrative jobs & ensuring that they have equality of opportunity.	3.56	1.0860
25	Coping with inadequate and incompetent staff.	3.48	0.7530
26	Boosting the status of outdoor education, music, art, and other cultural experiences.	3.44	0.8473
27	Broadening the range of subjects in school.	3.41	0.8884
28	Coping with non-dynamic/unmotivated & non-professional staff.	3.41	1.0099
29	Restricted promotion prospects.	3.37	0.7917
30	Untrained school administrators and teaching staff.	3.35	1.0175
31	Breaking traditional hierarchies of responsibilities so as to provide new experiences in the profession.	3.33	1.1094
32	Adopting the computer as an educational & administrative tool.	3.30	0.7753
33	Maintaining the school's function despite pressure from various groups.	3.27	0.8744
34	Arousing parents' awareness of child-care responsibilities.	3.26	0.9443
35	Dealing with a more informed & more critical community.	3.19	0.7494
36	Achieving less bureaucracy in schools.	3.15	1.0635
37	Removing U.E.	3.11	1.2195
38	Immobilized and aging staff.	2.93	0.6752
39	Examination-orientated education versus job-orientated education.	2.92	0.7961
40	Ensuring greater freedom of choice in materials being used in class.	2.88	0.9519
41	Ensuring that we do not lose our present assets in attempts to make further gains.	2.85	0.8640
42	Coping with the pressures to be more responsive to Board of Governors.	2.67	0.8771

**APPENDIX F****CALCULATION OF MEAN AND STANDARD DEVIATION**

### MEAN AND STANDARD DEVIATION

For example item number 1) in the Round Three responses, the results were:-

<u>Items</u>	<u>Scale</u>				
	(5) Extremely Impt.	(4) Very Impt.	(3) Some Impt.	(2) Little Impt.	(1) No Impt.
1) Catering for students who face unemployment.	6	15	6	0	0

Total number of respondents who returned responses = 27

6 respondents agreed that item 1) was extremely important

15 respondents agreed that item 1) was very important

6 respondents agreed that item 1) was of some importance

Nobody commented if it was of little or no importance

According to the 5-point Likert-type scale as coded above, the Mean and Standard Deviation could be computed by their respective formula as follows:-

$$\text{Mean} = \bar{x} = \frac{\sum_{i=1}^n X_i}{n}$$

Symbols  
x = Sample mean  
= Sum

Therefore Mean of item no.1 =  $\frac{(6 \times 5) + (15 \times 4) + (6 \times 3)}{27}$

n = Number of observation in sample

$$= \frac{108}{27} = 4 //$$

X<sub>i</sub> = i<sup>th</sup> sample value

S = Standard Deviation

Using the same symbols,

$$\text{Standard Deviation} = S = \sqrt{S^2} = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{x})^2}{n-1}}$$

Therefore Standard Deviation =  $\sqrt{\frac{1}{26} \{ (x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_{27} - \bar{x})^2 \}}$   
for item no.1

$$= \sqrt{\frac{1}{26} \{ (1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2) + (0^2) + (1^2 + 1^2 + 1^2) \}}$$

$$= \sqrt{\frac{1}{26} (6+0+6)}$$

$$= \sqrt{\frac{12}{26}} = 0.6794 //$$

APPENDIX G

SOME EXAMPLES OF THE ORIGINAL 136 RESPONSES  
FROM ROUND ONE RETURNS

Example One

The challenges are:

- 1) Providing a balance between satisfying the demands proclaimed by the 'establishment' and the community on the one hand, and maintaining freedoms for teachers and school administrators to develop the well-being, initiative and creativity of the students on the other.
- 2) Educating for leisure - unemployment; creating positive self-images in students whilst providing opportunity for self-set challenges and successes.
- 3) Allowing and providing opportunity for teacher experimentation, adaptation and research at the 'teaching-face'.

Example Two

The challenges are:

- 1) Coping with multi-cultural needs.
- 2) Falling rolls and the effects on staffing.
- 3) Improving school development and professional development of staff. Breaking with traditional hierarchies of responsibility to provide opportunities for new experiences in the profession.
- 4) 'Fielding' the move to restrict freedom of choice in materials being used in classes.
- 5) Pressure to be more accountable to Boards of Governors and parents in professional curriculum matters.
- 6) Ensuring that women take on (and are encouraged to do so) positions of responsibility.
- 7) Coping with the needs for professional development in a profession where remaining in the one school for very long periods is likely to be the norm.

### Example Three

The challenges are:

- 1) To develop further the concept of equal educational opportunity - to provide an education relevant and meaningful to students - at a time when educational instructions are under attack to meet particular objectives of social, economic, political and racial pressure groups.
- 2) To maintain professional direction and morale - to promote professional growth and responsibility at a time when falling rolls and economic pressures are slowing the avenues of promotion and add to erosion of morale prompted by public and political criticism.
- 3) To promote public and political awareness of educational needs to ensure maintenance and development of educational institutions.

### Example Four

The challenges are:

- 1) An increasing need to act in loco parentis to educate for changing social patterns (e.g. increasing leisure time, increasing unemployment and increasing technology).
- 2) To adapt to demands and needs for greater awareness of minority groups, such as Polynesian interest, on women's issues.
- 3) Resistance to political pressures which run counter to educational ideas.
- 4) To give students flexible attitudes and versatile skills.
- 5) To provide teachers unable to move from their present positions (because of falling rolls) a sense of purpose and self-worth.

## APPENDIX H

SOME EXAMPLES OF ROUND TWO RETURNS

Example One

The challenges are:

- 1) Social-economic problems - the gap between those who have little and those who are well-fitted to succeed.
- 2) Accountability - the demands parents make on behalf of their children.
- 3) Technological change.
- 4) Multi-racial issues. The integration of various cultures into the Education System.
- 5) Unemployment - providing for children who may never be employed.
- 6) Continuing Education of adults.
- 7) Teacher stress.
- 8) Arousing parents' awareness of child-care responsibilities.

Example Two

The challenges are:

- 1) Educating towards self-actualisation.
- 2) Ensuring that we do not lose our present assets in attempts to make further gains.
- 3) Providing a balance between satisfying the demands proclaimed by the 'establishment' and the community on the one hand and maintaining freedoms for teachers and school administrators to develop the well-being, initiative, and creativity of the students on the other.
- 4) Educating for leisure - unemployment; creating positive self-images in students whilst providing opportunity for student self-set challenges and successes.
- 5) Allowing and providing opportunity for teacher experimentation, adaptation and research at the 'teaching-face'.
- 6) Developing community awareness and understanding of what schools endeavour to achieve.
- 7) Untrained school administrators in relation to competent and experienced teaching staff.
- 8) Coping with social changes, political, bureaucratic and social pressures.

Example Three

The challenges are:

- 1) Coping with falling rolls.
- 2) Boosting the status of outdoor education, music, art and other cultural and broadening experiences.
- 3) Responding to and preparing for the pressures of social change.

Example Four

The challenges are:

- 1) Catering for students who face unemployment.
- 2) Training for adequate and fulfilling use of leisure time.
- 3) Curriculum review - core and non-core.
- 4) Falling school rolls and the management of contraction.
- 5) Multi-culturalism in community, school and classroom.
- 6) Staff stress.
- 7) Removing U.E.

Example Five

The challenges are:

- 1) The promotion of multi-culturalism in community, school and classroom.
- 2) To use new systems of evaluation and teaching methods to avoid 'failing' so many New Zealand children and making them feel failures for life. This includes removing S.C. and U.E.
- 3) Sharing of decision-making by staff.
- 4) Coping with staff stress.
- 5) In some way helping students who face unemployment - possibly for the rest of their lives.
- 6) Enriching the curriculum to make it more relevant to students, enabling them to see a purpose in what they are doing at school.
- 7) Equal opportunity for female staff and students.

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