UNIVERSITY OF CAPE TOWN

FACULTY OF EDUCATION

Researching the Educational Setting for Quality Data: the case of an 18-school research project in the Western Cape

A report presented
in partial fulfilment
of the requirements for the Degree of

MASTER OF EDUCATION
SPECIALIZING IN
EDUCATIONAL ADMINISTRATION, PLANNING AND SOCIAL POLICY

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ABSTRACT

Both what information should be collected and how that information should be collected, analyzed, and interpreted are reviewed from the perspective that effective educational planning depends, in large part, upon the development of timely and accurate data through research projects that are not only relevant to the needs of educational decisionmakers, but are also technically sound in nature. Toward this end, the compiled data from an 18-school research project conducted in the Western Cape in 1994 is analyzed to illustrate the conceptualization necessary for effectively researching the educational setting in order to obtain quality data.

1.0 INTRODUCTION

1.1 AIM OF THE REPORT

Through the analysis of an 18-school research project that was conducted in the Western Cape in 1994, the aim of this report is to emphasize the need for and importance of effectively researching the educational setting in order to obtain quality data. This task will take the form of a general discussion concerning "*what* information . . ." should be collected and "*how* . . ." it should be "collected, analyzed, and interpreted" from the perspective that it is "critical to remember that decision-makers require information to be provided promptly . . . in order to make informed policy decisions" (Ross & Postlethwaite, 1992:1-2).

1.2 STATEMENT OF THE PROBLEM

Ross & Postlethwaite (1992:1) assert that ministries of education require information about "educational inputs, conditions, processes, and outcomes . . ." in order that they might effectively go about their planning and policy activities. Within the South African context, the White Paper on Education and Training readily concurs with this assertion, acknowledging that a "reliable information base is a crucial requirement for a trustworthy planning process . . .," but also notes that "the current state . . . is far from satisfactory . . ." (Dept. of Ed., 1995:13). It is with respect to why the current state is referred to as being far from satisfactory that an 18-school research

project that was conducted in the Western Cape in 1994 (and shall henceforth be referred to as the WCRP) has been included for analysis within this report.

As part of an effort to contribute to a more satisfactory level of information, the WCRP was conducted as a pilot study "to an intended nationwide investigation exercise" (WCRP, 1994). A team of ten field workers collected data on students, teachers, classes, principals, parent-teacher-student associations, and school buildings of 18 Department of Education and Training (DET) and House of Representatives (HOR) rural and urban schools of both primary and secondary levels. Despite the fact that this research project was conducted in February and March 1994, a report has not been provided to the schools as they were promised, nor has a report been submitted (at the time of writing this report in October 1995) with respect to the study as a whole.

Notwithstanding the possibility that the researchers may have been distracted by other obligations, the following analysis of the WCRP suggests that its failure to produce timely, quality information is more likely due to the fact that the data which was compiled is unwieldy. The problem encountered with the WCRP is the difficulty associated with analyzing and interpreting this data as it is confusing, intricate, and difficult to use, and illustrates more generally some of the problems associated with data collection.

1.3 SIGNIFICANCE OF THE REPORT

Within their book about the economics of education, Coombs and Hallak (1987:97) state that "educational systems

everywhere must change continuously to adapt to the major changes taking place in their economic, technological, social, cultural and political environments." They take the position that for educational systems to function effectively in today's environment "requires a much more comprehensive, dynamic, and integrated . . ." approach toward educational planning, concluding that "better information . . . can have a powerful positive effect on education and on economic and social development" (Coombs & Hallak, 1987:97-98).

Following Coombs and Hallak (1987), Chapman (1991:336) relates that "[o]ne of the highest priority issues in many international educational development projects is improved collection, analysis and use of . . . data in decision making." Yet while there has been development in this respect, Puryear (1995:80) observes that the current "problem is with the quality of the data reported rather than with a failure to report."

While all of this may appear obvious, Chapman (1991:366) reviews the situation in five developing countries and notes that the development of educational information systems has been complicated by:

- explosive growth in the size of educational systems;
- increased donor demand for accountability; and
- increased complexity of educational systems as ministries of education undertake more complex programs and pursue multiple objectives.

Within these constraints, Chapman (1991:375) also highlights the need to understand and use quality data for effective educational planning at the national level to:

- describe the status of a program or system;
- identify trends;

- monitor the progress of particular programs or projects; and
- develop projections.

In summation then, the issue surrounds the importance of assuring the development of quality data. The significance of this report is captured in Ross and Mahlck's (1990:3) observation that "*planning the quality of education through informed decision making requires the availability of accurate and timely information. . . .*"

1.4 ORGANIZATION OF THE REPORT

This report is primarily organized around a general discussion on the development of quality data by way of what information should be collected and how information should be collected, analyzed, and interpreted. Central to this discussion is the analysis of the WCRP.

To begin is a literature review that contextualizes what has become recognized as effective research within the educational setting. Following that is an analysis of the WCRP that examines both what it intended to research and how it was conducted or, more specifically, the dataset that was a result of how it was conducted. A third component of this analysis includes an examination of the WCRP in light of conventional research methodology. The conclusion accentuates effective educational research from the perspective of the conceptualization necessary to obtain quality data. Lastly, a number of recommendations will summarize those issues that have emerged as integral to the development of quality data based on the case of the WCRP.

2.0 LITERATURE REVIEW

Research is a way of knowing what is changing and may even help in the understanding of why it is changing. For the purpose of this report, research is interpreted as "a way of knowing based on systematic and reproducible procedures that aim to provide knowledge that people can depend on" (Wolf, 1993:17) in the form of quality data. At the very least, quality educational research should be:

- significant (worth collecting);
- clearly definable (specifically determinable);
- feasible (that which is accessible--without an undue amount of time, energy, or money); and
- ethical (causes no physical or psychological harm to anyone or anything) (Fraenkel & Wallen, 1993:24).

Yet beyond these basic criteria remain a number of less tangible considerations that "include certain assumptions about the research domain and the specific phenomena, a specific theoretical framework or model, a specific research model and the resultant methodological preferences" (Mouton & Marais, 1994:24). Although a discussion of each of these considerations extends beyond the scope of this report, this literature review discusses some of the developments within educational research concerning what is relevant for the attainment of high quality data.

2.1 RESEARCHING THE EDUCATIONAL SETTING

Kreft (1993:105) traces the development of educational research from the early 1960's to the present and

identifies what he calls first and second generation research. First generation research was largely influenced by Coleman et al. (1966) who published the controversial Equality of Educational Opportunity in which they questioned the efficacy of schools in bringing about improvement in student achievement. The work emphasized and laid down what has become the conventional wisdom in the field--i.e. socio-economic background is crucial as a predictor of student achievement. A second contribution of first generation research was that the student became the primary unit of analysis. Although certain elements of the student's environment were occasionally factored into the research, such as teachers and peers, they were factored in with specific reference to the student.

An important characteristic of first generation research was that it was essentially based on input-output analyses, which underplayed the idea that there were many dynamics taking place in schools. Under these circumstances the global characteristics of schooling were generally not factored into this type of research approach, particularly since global characteristics were not easily disaggregated and made compatible with analyses focused at the individual. This, however, was of little concern in light of the aforementioned research of 1966 that suggested

> socio-economic factors explained more variance in the achievement of students than did the amount of money allocated to schools, the quality of the teachers, and-or the appearance of the schools buildings combined (Kreft, 1993:105).

This notion of the ineffectualness of schools on student achievement was not the last word on researching the educational setting. By the 1980's research began to show that parental involvement combined with higher expectations of the student by the parents, teachers, and students

amidst a well-organized, disciplined school environment were in fact contributory factors of quality education; schools were no longer viewed "as the black box in which something goes in and something comes out" (Kreft, 1993:106). In fact, research conducted by the World Bank throughout developing countries has "generated results indicating that schools and teachers do matter . . .," and perhaps that they matter "even more than socioeconomic status" (Cohn & Rossmiller, 1987:377). What has been cited as second generation research is to approach the determinants of quality education in a more holistic manner, accepting that the school environment does play a significant role in student achievement.

Recognizing the educational setting as a complex, multidimensional environment has, in turn, led to attempts by second generation researchers to identify those determinants of quality education which can be utilized as indicators of quality education so that "the collection, the processing and the communication of information may contribute to better quality of education . . ." (Grisay & Mahlck, 1991:61). The challenge has been to identify appropriate determinants; while Drewnowski is quoted as noting that poor indicators will result in "an incoherent maze of variables, the definitions of which are muddled, quantification procedures questionable and practical uses, if any, extremely doubtful . . ." (Johnstone, 1976:10), Puryear (1995:82) concludes that the lack of "carefully developed indicators . . ." will leave policy makers with little more than "basic statistics. . . ."

The criticism levelled against efforts by second generation researchers to develop determinants of quality education is that they have tended to exclude a substantial enough role for extraneous factors, and possibly their precedence, over

those which emanate from the educational setting; it has been suggested that the current development of determinants has been too limited to the educational setting, and hence only serve to "sanitize" the impending sociological realities of "inequality, cultural hegemony, sexism, racism . . ." among "other social and educational disadvantages and conflicts that surround and pervade schooling" (Angus, 1993:343-344). According to Angus, there has been too great a swing from the thinking that schools do not make a difference in student achievement to affirming that schools do make a difference, at the expense of failing to recognize the existing interrelationship between schools, culture, and society. Instead, Angus (1993:342) advocates the need to recognize the interrelationship between schools, culture, and society as "dynamic and interactive such that, for instance, schools and schooling are influenced by, but also influence, the cultural milieu of the society in which they are embedded." Hitchcock and Hughes (1989:25), too, express the "need for a detailed appreciation of both the immediate interactional circumstances of events . . . and the historical and cultural context out of which they grow."

This need to encompass a wider sociological frame of reference with respect to the ongoing development of determinants of quality education within second generation research may be well founded: encapsulating the accumulated results of educational research conducted throughout the world, Gannicott and Throsby (1992) remark not only that no one characteristic of quality education is independent of another, but that the degree to which characteristics compliment one another varies from one school environment to another. Albeit that research has "produced a list of ingredients . . ." which make for effective schooling, it has not "produced a recipe for an

effective school" (Cohn and Rossmiller, 1987:399). Perhaps that is why Namboodiri et al. (1993:291) have arrived at the astute observation that "[m]any things in this world have small but nonetheless consequential effects." Nevertheless, according to Scheerens (1992:66), "it is fair to say that there is a growing consensus on a list of school and instructional characteristics that have been shown to matter as far as reaching relatively high educational outcomes is concerned."

A development which has run parallel to that of recognizing the educational setting as a complex, multidimensional environment is the increased argument for, and use of, qualitative data and techniques:

> Researchers have pointed to the problems involved in relying solely upon objective, quantifiable measures or indices of social phenomena without paying attention to the interpretations and meanings individuals assign to events and situations in a qualitative way (Hitchcock & Hughes, 1989:24).

Although this development continues to provide cause for debate, particularly among researchers and philosophers of science who view "quantitative and qualitative studies in opposition to one another . . .," Wolf (1993:27) argues "their functions can be complementary as long as one does not expect some kind of philosophical purity in research." Beginning with the position that quantitative studies are instrumental in establishing relationships among variables, Wolf (1993:27) maintains that "[q]ualitative studies do play a useful role in attempting to understand the mechanisms by which relations among variables are established."

Given the ever changing structure of the educational system, with its "curriculum and textbooks, modes of teaching, methods of teacher training, the amount and type

of provisions to schools such as science laboratories, textbooks, furniture, classroom supplies, and so on" (Postlethwaite, 1992:3), research has become increasingly important for rational decisionmaking in the field of educational planning. Not surprisingly, notes Wolf (1993:9), there has been a "vast expansion in the *availability* of research literature. . . ." But he advises "the educational planner . . . to be cautious in choosing research that is of high *quality* in terms of its relevance and technical soundness" and encourages him or her "to discriminate between high quality educational research and other research that should not be relied upon for decision-making purposes."

With respect to the "relevance and technical soundness" (Wolf, 1993:9) of what information the WCRP was to collect and how that information was collected, the WCRP will next be analyzed for its effectiveness as a tool for researching the educational setting to obtain quality data.

3.0 ANALYSIS AND INTERPRETATION OF THE WCRP

Educational specialists for UNESCO have observed that the dominant approach toward education statistics and research is to "collect and file" rather than "understand and use" (Puryear, 1995:82). This observation is descriptively in keeping with the case of the WCRP whereby information was collected and compiled for the WCRP over the course of February and March 1994 but neither an analysis nor an interpretation of that information have been completed at the time of writing this report (October 1995); in the case of the WCRP, information was collected and filed, so to speak, but not understood and used or, as it may be more accurately expressed, the data that was collected for the WCRP was compiled such that it does not lend itself to being either understood or used.

3.1 METHODOLOGY

As this report originated as a consequence of the inability to understand and use the WCRP dataset, the analyses employed within this report are directed at specifying why the WCRP dataset cannot be understood or used. Toward this end, this analysis is divided into three sections:

3.2 OVERVIEW OF THE WCRP

3.3 WHERE THE WCRP WENT WRONG

3.4 WHY THE WCRP WENT WRONG

Respectively, these sections investigate what the intent and design of the WCRP was, how it went about that task, and the likely reasons, through examining conventional research methodology, why it went wrong. At the beginning

of each section is a preamble specific to that section in terms of the necessary background, organization, and/or methodological explanation depending upon the nature of the section, while at the end of each section is an interpretation.

Although all seven of the WCRP schedules are generally referred to throughout this analysis, a more detailed analysis was limited to four schedules: School Observation, Class Observation, PTSA Interview and Teacher Questionnaire. The decision to limit a detailed analysis to four of the seven schedules was to limit the scope of the inquiry while at the same time seeking to reflect a representative perspective of the WCRP. The four schedules were randomly selected so that at least one schedule from each of the three types of instrumentation schedules was used (i.e. observation [x2], interview [x3], and questionnaire [x2]). From amongst the 3 interviews, the Principal Interview was not considered for selection as the data compilation had not been completed and, despite efforts to obtain it, the raw data was unavailable for further processing. The remaining three schedules not selected for the detailed analysis are still referred to (i.e. Principal Questionnaire, Teacher Interview, and Student Questionnaire), but the difference in their contribution to this analysis is that it has been limited to only those issues that were readily apparent or overt.

3.2 OVERVIEW OF THE WCRP

This section of the analysis seeks to establish the intent and design of the WCRP.

3.2.1 Objectives of the WCRP

The WCRP consisted of a cross-sectional survey of 18 schools located in the Western Cape. The targeted schools included an equal number of both primary and secondary schools, of both DET and HOR departments. The opening comments of the WCRP (1994) *Introduction & Objectives* state that "[t]here is general acknowledgement of a critical need for information descriptive of the *real* condition of the South African schooling system in both quantitative and qualitative terms." Access to such information, it is concluded in the introduction, is imperative for the "optimal reconstruction of schools." The WCRP was initiated as a pilot study toward the intended implementation of a "nationwide investigation exercise". Its "ultimate aim" was the "development of school profiles which can better inform initiatives, discussions and practical interventions around educational reconstruction."

Through this process, the WCRP stipulated that it sought to:

a) Inform an assessment of the material and human resources available for education in communities, the educational needs of communities, and the quality of education offered in schools within communities.

b) Provide a means through which education change agents - government and non-government - and communities can make informed decisions around interventions in education reconstruction. Such decisions might for instance include planning priority areas for intervention on the basis of need matched against capacity of schools and communities to manage resource and reconstruction interventions.

Additionally, the WCRP was to "yield three important by-products:"

i) an **investigation tool/process** that can be fine-tuned and used nationwide in further surveys by

the Education Foundation, local NGOs, educational institutions, individual communities, etc.,

ii) an **action strategy/process** that will be sensitive to community needs and will be a product of informed analysis and consultations with communities, NGOs, education specialists, government, etc., and

iii) a mechanism that may validate information currently available in school files and departmental records, collected via the ET20, as well as capture information additional to the ET20.

It would be difficult to challenge the relevance of the WCRP based upon the basic criteria for quality educational research presented within the literature review (see p5) as it was significant, clearly defined, and ethical. It appears as though it should have been feasible as well:

> The proposed preliminary investigation will put into the field about 10 full-time researchers. It will commence mid-February and continue through March 1994, whereupon analysis of data from the fieldwork will begin. This pilot exercise is intended to culminate in a survey report to be completed by 31 May 1994 (WCRP, 1994).

3.2.2 Instrumentation and Documentation of the WCRP

In all, six units of analysis were identified including the school, classes, principal, parent-teacher-student association (PTSA), teachers, and students. The documentation that accompanied the WCRP includes:

-the instrumentation, consisting of seven schedules:

Unit of Analysis	Instrument
School	Observation
Class	Observation
Principal	Interview
PTSA	Interview
Teacher	Interview
Teacher	Questionnaire
Student	Questionnaire

- corresponding precoded and postcoded spreadsheets upon which the collected data from each schedule was compiled;
- a corresponding code list accompanying each postcoded spreadsheet; and
- a corresponding summary list accompanying each schedule.

The schedules, other than the Teacher Questionnaire, were divided into sections reflecting an inquiry into a variety of issues:

1) School Observation
   a) Resource Availability and Condition
   b) School Ethos and Culture
   c) School-Community Relations
   d) General
   e) Pupil/Staff Details

2) Class Observation
   a) Background Information
   b) Teaching and Learning
   c) General

3) Principal Questionnaire
   a) Personal Background
   b) School Management and Governance
   c) Resources and Finance
   d) External Relations
   e) General

4) PTSA Interview
   a) Background
   b) Activities
   c) Vision
   d) Interviewer's Observation

5) Teacher Interview
   a) Background
   b) Teaching and Learning
   c) Governance and School Organization
   d) Relations
   e) General
   f) Interviewer's Observations

6) Teacher Questionnaire
   - no specified sections
     (but similar in content to #5 above)

7) Student Questionnaire
   a) Background
   b) Repetition

c) Drop out
d) Textbooks
e) Learning Materials
f) School Attitudes
g) Teachers
h) Principal
i) Learning Conditions
j) Punctuality
k) Homework
l) Exams
m) Study Periods
n) Language
o) Uniforms
p) Health and Nutrition
q) Study Groups
r) Matric
s) Governance
t) General
u) Interviewer's Observations

3.2.3 Nature of the Questions

Toward revealing the inherent nature of inquiry within these schedules, a count was made of both the quantitative and the qualitative questions of the four schedules selected for a more detailed analysis.

Quantitative questions were identified as those sorts of questions that elicited yes/no responses of fact or that consisted of a numeric response (eg. "Years of teaching experience") and were thus of a close-ended nature. Qualitative questions were identified as those sorts of questions that called upon a judgement/opinion response on behalf of the respondent, the interviewer, or the observer and were thus of an open-ended nature.

The results of this inquiry illustrate that the four schedules contained a reasonable number of both

quantitative and qualitative questions:

	Quantitative	Qualitative	Total
School Observation	27	25	52
Class Observation	13	21	34
PTSA Interview	9	22	31
Teacher Questionnaire	17	19	36

3.2.4 Interpretation

For the purpose of this report, it is sufficient to conclude that, in terms of its relevance, the WCRP was in keeping with the contemporary research practices of second generation research and that it did seek to research those units of analysis perceived to be indicative of quality education. Likewise, for the purpose of this report, it is concluded that it appears as though the WCRP was designed in accordance with the intended aim of developing school profiles given the scope of issues covered within the seven schedules, utilizing both quantitative and qualititative measures for a description "of the *real* condition of the South African school system . . ." (WCRP, 1994). Insofar as sections of the WCRP instrumentation were to gather such information as school-community relations and personal background information from the principals, teachers, and students, as well as the PTSA vision for the school beyond the limits of the immediate school environment, it can also be said that the WCRP was in keeping with one of the latest developments to emerge out of second generation research, as presented within the literature review and quoted from Hitchcock and Hughes (1989:25), that "a detailed appreciation of both the immediate interactional circumstances of events . . . and the historical and cultural context out of which they grow" are necessary in order to consider those extraneous influences which emanate beyond that of the educational setting.

At the end of the literature review, Wolf (1993:9) was cited as advising the educational planner to discriminate research on the basis of quality "in terms of its relevance and technical soundness." The WCRP does indeed seem relevant; what the WCRP wanted to collect information on, and in fact did collect information on, is of indisputable relevance to South African educational reconstruction. But this aspect of the WCRP constitutes only one of the two conditions which Wolf (1993) attributes as necessary to quality research. The following section within this analysis will consider the condition of technical soundness.

3.3 WHERE THE WCRP WENT WRONG

This section of the analysis presents a number of data collection problems associated with the WCRP as they were identified within the dataset:

3.3.1 Missing Data
3.3.2 Unusable Data
3.3.3 Inconsistencies within the Compiled Data
3.3.4 Complexity of the Labelling

These problems emerged over the course of trying to understand and use the WCRP dataset. Although they were not, in themselves, problems that dismissed outright the usability of the WCRP, combined they tended to have a compounding effect that eventually rendered the process of using the WCRP dataset virtually impossible.

The nature of each problem is explained and, in most instances, examples are provided. These examples are neither unique nor inclusive of all the concerns within the WCRP, but nevertheless serve to reveal the lack of technical soundness prevailing throughout the WCRP dataset.

3.3.1 Missing Data

One of the first problems that emerged upon attempting to manipulate the WCRP dataset was that efforts to seek the responses to a given question were consistently hindered by the fact that some portion or aspect of the response was not to be located on either the precoded or postcoded spreadsheets. The following list of schedules illustrates the missing data that impeded the manipulation of the WCRP dataset. It is a listing of the data that was not collected, not entered, or was otherwise incomplete:

School Observation:

- no record of School 7
- no record of section E: Pupil/Staff Details.[1] The content of this particular section included such details as student numbers by grade/gender, attendance/dropout/repeater rates, matric results, number of teachers/administrators/ service staff by qualifications/age/race, etc.

Class Observation Schedule:

- no record of School 14

PTSA Interview:

- Schools 2, 7, 11, 14 and 16 were absent from the data compilation in spite of the respective Principal Interview schedules confirming that some form of PTSA existed at each of these schools[2]

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[1]This is probably one of the most crucial components of the WCRP and undoubtedly had to have been collected. The collection of this information is identified as one of the "three important by-products" the WCRP (1994) was to yield.

[2]The omission of these questionnaires would certainly have impeded the efforts to develop school profiles, which was the "ultimate aim" of the WCRP (1994) according to its objectives statement.

Teacher Questionnaire:

- a total of seventeen questionnaires were only half entered (either the precoded or the postcoded data was entered, but not both)
- all of the data compiled for two of the questions was incoherent (and was thus considered missing)
- the responses to five of the questions were not recorded (i.e. there was no trace of these responses on either the precoded spreadsheet or the postcoded spreadsheet)

Student Questionnaire:

- although the Student Questionnaire was not missing any data, it is worthy to note that the postcoded data for six student questionnaires from School 18 was mistakenly recorded as belonging to School 17

Principal Interview:

- the postcoded data was never compiled (and although photocopies of the original interviews were eventually obtained in order that all of the data that was collected could be compiled, there was an error made in the photocopying to the extent that 20% of the pages to have been received were missing)

3.3.2 Unusable Data

Having determined exactly which data was and was not accounted for still did not facilitate the manipulation of the WCRP dataset as the next problem to emerge was that, when all the responses to a given question could be located, a portion of them were found to be unusable. Unusable data was determined to be those responses that were recorded as out-of-range values on the precoded and postcoded spreadsheets. The number of unusable responses was tabulated for each of the following four schedules as per their question type (i.e. quantitative or qualitative) as well as the combined total. The following results

reflect the percentages of unusable data:[3]

	Unusable Quantitative Data %	Unusable Qualitative Data %	Total Unusable Data %
School Observation	9.2	13.4	11.2
Class Observation	23.1	4.5	11.6
PTSA Interview	16.2	0.8	5.3
Teacher Questionnaire	12.0	6.7	9.0
Total unusable data for the above schedules:			**9.6%**

In and of themselves, these percentages cannot be regarded as overly problematic. The conclusion with respect to this concern is that the percentages of total unusable data for the above four schedules still did not reject the usefulness of the WCRP. But, because of data which was either missing or unusable, the task of data manipulation became limited to those questions for which there was sufficient data. However, other less tangible problems then began to emerge as to why the WCRP dataset was so hard to understand and use.

3.3.3 Inconsistencies within the Compiled Data

With respect to the number of inconsistencies that existed throughout the WCRP, four categories were established:

3.3.3.1 WCRP files organization

3.3.3.2 Interchanging values

3.3.3.3 Labelling of schedules and columns

3.3.3.4 Coding

Within these categories some of the inconsistencies referred to are relatively general in nature, while others are more specific and, hence, include detailed examples.

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[3]See Appendix A for method of calculation

3.3.3.1 WCRP files organization

The WCRP files have been named and stored on computer software in an exceedingly unsystematic manner. For example, the following three schedules have been paired with their corresponding summary list names:

PTSA Interview	sumptsa
Teacher Interview	teachsum
Teacher Questionnaire	selfad

With over 50 files for the WCRP, finding a file was a process of hit and miss. Apart from the lack of systematically named files, none of the files were merged into any particular format (for example, into separate directories according to each of the seven schedules) in order to facilitate the effort to retrieve a file, but were simply lumped together.

3.3.3.2 Interchanging values

This particular inconsistency applies to four different kinds of problems associated with data entry procedures within the WCRP dataset.

3.3.3.2.1 Throughout the whole of the WCRP dataset, the following three entries "0", "-9999.99" or "a blank space" were interchangeably utilized for a variety of conditions. Within the WCRP dataset, any one of these three entries meant any one of the following:

- the respondent did not enter a response;
- the respondent's choice was void (i.e. a nonexistent/incorrect response);
- the response was incorrectly entered at the point of data compilation; or
- no response was required/applicable due to a previous response.

Additionally, "0" was used as a value both quantitatively (i.e. zero) and qualitatively (i.e. a coded response).

The consequence of this inconsistency was that the responses within each column had to continually be re-interpreted. Furthermore, this lack of consistency negates the possibility of later referring to the compiled data for the evaluative purpose of determining which and why certain questions may have elicited a number of incorrect responses. For example, it would have been useful to check for questions which were rarely answered due to their ambiguity or their sensitivity.

3.3.3.2.2 Although a precoded and a postcoded spreadsheet accompanied each schedule, precoded responses were occasionally recorded on the postcoded spreadsheet and vice versa. For example, consider the following two questions from the PTSA Interview:

g) What is the average level of formal education of its office bearers?
1) Primary 2) Secondary 3) Post Secondary

h) Describe your background as chairperson of the governing body (i.e. occupation, history of community and school involvement, etc.).

While g) was a precoded question and h) was a postcoded question, the responses to these two questions appeared side by side on the same spreadsheet. This particular spreadsheet (i.e. what was supposed to be the postcoded spreadsheet for the PTSA Interview) was comprised of about half precoded and half postcoded information.

3.3.3.2.3 Aside from the previous inconsistency cited whereby responses interchangeably appeared on the postcoded and precoded spreadsheets, there existed the additional inconsistency whereby the responses for precoded and postcoded questions were occasionally combined and entered under the same column heading on either the precoded or postcoded spreadsheet. The following example was obtained from the Teacher Questionnaire whereby the responses to

two questions were combined into one column on the postcoded spreadsheet:

d) Are you happy to stay with your current subject(s)?
1) Yes 2) No

e) Explain your answer to d).

Although no column existed for the responses to d), as would typically exist on the precoded spreadsheet, e) was located on the postcoded spreadsheet. Within the code list it was revealed that d) and e) were combined into one column:

Yes		0
No	Unfair to pupils	1
	Lack subject knowledge	2
	Not using qualifications	3
	Too much work	4
	New interests/want to change	5
	Lack of challenge/development	6
	Language problem	7
	Pupils not prepared/can't cope	8
	Other	9

Note: in this example, zero was assigned a qualitative value.

The particular problem cited here is not calling into question the way in which the coding was done but the fact that it was sometimes like that, and sometimes not.

3.3.3.2.4 For questions where respondents provided more than one response, additional columns were inserted into the postcoded spreadsheet as required to accommodate for each and every additional response. The data was usually compiled so that the first response was entered in the first column, the second response in the second column, etc. On occasion, however, a respondent's sole response was randomly entered in the second, or third, or fourth, etc., column.

3.3.3.3 Labelling of schedules and columns

The problems associated with the labelling of schedules and the labelling of columns are dealt with separately.

3.3.3.3.1 Schedule questions were not consistently labelled. Although sections within the schedules were usually lettered as A, B, C, etc., with the associated questions being numbered, there were instances when sections were numbered 1, 2, 3, etc., with associated questions being lettered.

3.3.3.3.2 The labelling of the columns was difficult to decipher in part due to their complex format (which will be discussed further in 3.3.4 Complexity of the Compiled Data) and in part due to inconsistencies in that format. Consider questions B1c, B1d, and B1e of the PTSA Questionnaire which read:

c) Would you see your body as having been successful in its work?
1) Yes 2) No

d) Explain your answer to c).

e) If no to c), what would make your body more successful?

There were six corresponding columns in which the responses to these questions were compiled. They were labelled accordingly as:

B1(C), B1(D)1a, B1(D)1b, B1(D)ic, B1(D)ii, and B1(E) where column:

- B1(C) denoted precoded data of either the response "yes" or "no"
- B1(D)1a, B1(D)1b, B1(D)ic denoted up to three responses for those who responded to B1(C) in the affirmative
- B1(D)ii denoted the postcoded data for those who responded to B1(C) in the negative
- B1(E) denoted the postcoded data for those who responded to B1(C) in the negative

The intricacy of this alpha-numeric progression became unduly complicated when the progression itself was inappropriately labelled as was the case with an arrangement like B1(D)1a, B1(D)1b and B1(D)ic.

3.3.3.4 Coding

This particular inconsistency applies to both the coding of data and the coded data as they were listed on the code list.

3.3.3.4.1 In many instances the manner in which responses were coded was inconsistent with the information required to later interpret the data. The following example was extracted from the PTSA Interview:

When was the body formed?

_____ years ago _____ months ago

The responses to this question as they were entered on the postcoded spreadsheet read: 13, 4, 3, 5, 8, 1, 6, 30, and 12. There was no indication on the spreadsheet or within the code list as to whether these numbers represented "years" or "months."

3.3.3.4.2 This particular example from the PTSA Interview presents the sort of inconsistencies found within the code listings. Aside from the fact that the responses to question C2a were listed under a column heading mistakenly labelled as C2c, three of the eighteen codes within the PTSA code list for question "C2a-but-labelled-C2c" did not correspond accurately with the codes found on the postcoded spreadsheet as two of the codes (6 and 13) were not referred to at all on the postcoded spreadsheet while another (code 10) was altogether absent from the code list. It seems highly irregular that two responses would be coded on the code list without appearing within the spreadsheet

and that the 10th code should be absent from an otherwise serially progressive list of whole numbers.

3.3.4 Complexity of the Compiled Data

This fourth and last problem identifies the complexity of the format in which the data of the WCRP was compiled. Aside from the three problems already cited, the WCRP dataset simply did not readily lend itself to be manipulated due to the overall complexity of the alpha-numeric system utilized throughout the WCRP.

To illustrate the complexity of this system, the column headings of the precoded and postcoded spreadsheets for the Teacher Questionnaire schedule have been inserted into this report. For the sake of referencing, column headings are accompanied by a number, in bold, immediately above. In cases where there is more than one column for the same question, the reference numbers (i.e. those in bold) have been paired with another number enclosed within brackets to indicate the number of columns associated with that particular question.

PRECODED SPREADSHEET COLUMN HEADINGS:

1	**2**	**3**	**4**	**?**	**?**	**16**	**17**	**18**	**19**
1(A)	1(B)	1(C)	1(D)	4(C)	4(F)	8(A)	8(B)	9	10(A)
21	**23**	**24**	**25**	**26**	**27**	**29**	**30**	**31**	**32**
11(A)	11(C)	12(A)	12(B)	12(C)	12(D)	13(A)	13(B)	13(C)	13(D)
33	**35**	**37**	**38**	**39**					
14(A)	14(C)	15(A)	15(B)	15(C)					

POSTCODED SPREADSHEET COLUMN HEADINGS:

6(1)	**6(2)**	**6(3)**	**6(4)**	**6(5)**	**6(6)**	**6(7)**	**6(8)**	**6(9)**	**6(10)**
3(A)I	3(A)II	3(A)III	3(A)IV	3(A)V	3(A)VI	3(B)I	3(B)II	3(B)III	3(B)IV
6(11)	**6(12)**	**6(13)**	**6(14)**	**6(15)**	**6(16)**	**6(17)**	**6(18)**	**8(1)**	**8(2)**
3(B)V	3(B)VI	3(C)I	3(C)II	3(C)III	3(C)IV	3(C)V	3(C)VI	4(B)1(I)A	4(B)1(I)B

8(3)	8(4)	8(5)	8(6)	8(7)	8(8)	8(9)	8(10)	8(11)	8(12)
4(B)1(I)C	4(B)1(I)D	4(B)1(I)E	4(B)1(II)A	4(B)1(II)B	4(B)1(II)C	4(B)1(II)D	4(B)1(II)E	4(B)1(II)F	4(B)1(II)G
8(13)	**8(14)**	**8(15)**	**8(16)**	**8(17)**	**8(18)**	**8(19)**	**8(20)**	**8(21)**	**8(22)**
4(B)1(III)A	4(B)1(III)B	4(B)1(III)C	4(B)1(III)D	4(B)1(IV)A	4(B)1(IV)E	4(B)1(IV)C	4(B)1(IV)D	4(B)1(IV)E	4(B)1(V)A
8(23)	**8(24)**	**8(25)**	**8(26)**	**8(27)**	**8(28)**	**8(29)**	**8(30)**	**8(31)**	**8(32)**
4(B)1(V)B	4(B)1(V)C	4(B)1(V)D	4(B)1(V)E	4(B)1(VI)A	4(B)1(VI)E	4(B)1(VII)A	4(B)2(I)A	4(B)2(I)B	4(B)2(I)C
8(33)	**8(34)**	**8(35)**	**8(36)**	**8(37)**	**8(38)**	**8(39)**	**8(40)**	**8(41)**	**8(42)**
4(B)2(I)D	4(B)2(I)E	4(B)2(I)F	4(B)2(I)G	4(B)2(I)H	4(B)2(I)I	4(B)2(II)A	4(B)2(II)B	4(B)2(II)C	4(B)2(II)D
8(43)	**8(44)**	**8(45)**	**8(46)**	**8(47)**	**8(48)**	**8(49)**	**8(50)**	**8(51)**	**8(52)**
4(B)2(II)E	4(B)II(F)	4(B)II(G)	4(B)2(III)A	4(B)2(III)B	4(B)2(III)C	4(B)2(III)D	4(B)2(IV)A	4(B)2(IV)B	4(B)2(IV)C
8(53)	**8(54)**	**8(55)**	**8(56)**	**8(57)**	**8(58)**	**8(59)**	**8(60)**	**8(61)**	**8(62)**
4(B)2(IV)D	4(B)2(IV)E	4(B)2(V)A	4(B)2(V)B	4(B)2(V)C	4(B)2(V)C	4(B)2(V)D	4(B)2(VI)A	4(B)2(VI)B	4(B)2(VI)C
8(63)	**8(64)**	**8(65)**	**8(66)**	**8(67)**	**8(68)**	**8(69)**	**8(70)**	**8(71)**	**8(72)**
4(B)3(I)A	4(B)3(I)B	4(B)3(I)C	4(B)3(I)D	4(B)3(I)E	4(B)3(I)F	4(B)3(II)A	4(B)3(II)B	4(B)3(II)C	4(B)3(II)D
8(73)	**8(74)**	**8(75)**	**8(76)**	**8(77)**	**8(78)**	**8(79)**	**8(80)**	**8(81)**	**8(82)**
4(B)3(II)E	4(B)3(II)F	4(B)3(II)G	4(B)3(III)A	4(B)3(III)B	4(B)3(III)C	4(B)3(III)D	4(B)3(IV)A	4(B)3(IV)B	4(B)3(IV)C
8(83)	**8(84)**	**8(85)**	**8(86)**	**8(87)**	**8(88)**	**10**	**11**	**12 & 13**	**14(1)**
4(B)3(IV)D	4(B)3(IV)E	4(B)3(V)A	4(B)3(V)B	4(B)3(VI)A	4(B)3(VII)A	5(B)	5(C)	5(E)	6(A)I
14(2)	**14(3)**	**14(4)**	**14(5)**	**14(6)**	**14(7)**	**14(8)**	**14(9)**	**14(10)**	**14(11)**
6(A)II	6(A)III	6(A)IV	6(A)V	6(A)VI	6(A)VII	6(B)I	6(B)II	6(B)III	6(B)IV
14(12)	**14(13)**	**14(14)**	**20**	**22(1)**	**22(2)**	**22(3)**	**22(4)**	**28**	**36**
6(B)V	6(B)VI	6(B)VII	10(B)	11(B)I	11(B)II	11(B)III	11(B)IV	12(E)	14(D)
40	**41(1)**	**41(2)**	**41(3)**						
15(D)	16(A)	16(B)	16(C)						

Apart from the sheer length of some of these intricately labelled column headings, they often became more difficult to follow given the fact that a number of other difficulties were associated with their arrangement:

- what should have been the responses to what would have been column headings 2, 5(A), 7, 14(B), and 17 were missing (which is why reference numbers 5, 9, 15, 33, and 41 are absent).
- column heading 5(E) (reference 12 & 13) contained the responses to both questions 5(D) and 5(E).

Noteworthy, too, is that column headings 16(A), 16(B), and 16(C) (reference 41[1-3]) were actually numbered within the questionnaire as 16(1), 16(2), and 16(3) respectively.

As an example of how data was compiled in some instances, three questions from the postcoded spreadsheet were selected: questions 3a), 4a), and 4b) (reference 6[1-17] and 8[1-88] respectively). Question 3a) reads:

> List previous and current employment, positions held and time length of service.
>
> | Employer and Position | Years of service 1)<1 2)1-3 3)4-6 4)7-10 5)10+ | Reason for leaving |
> |---|---|---|

The codes for question 3a) with the corresponding code list read:

Position (1x6)	Teachers Assistant	1
	HOD	2
	Deputy Principal	3
	Principal	4
	Other Teacher	5
	Other non teaching	6
Years (1x6)		
Reason for leaving (1x6)	Personal	1
	Positive Professional	2
	Negative Professional	3

Six columns were allotted for each part of the three-part question, i.e. eighteen columns in all, (reference 6[1-18]). Thus, an example of a sample entry (selected at random) as it was coded within the postcoded spreadsheet reads 6, 2, and 2 in the first column of each of the three parts, and 1, 2, and 4 in the second column of each of the three parts. According to the code list, this particular example indicated two employment positions and would be interpreted in the following way:

- the first employment position was in the capacity of "Other non teaching", for between "1-3" years of service, leaving for "Positive Professional" reasons
- the second position was in the capacity of "Teacher Assistant", for between "1-3" years of service, but leaving for, according to the code list, the unspecified value of "4" ("4" did not appear as one of the listed choices on the code list)

Aside from the out-of-range value, this example is decipherable which is, unfortunately, unlike the example to follow.

What were listed within the Teacher Questionnaire as questions 4a) and b) consisted of more than four times the number of column headings than for the example just provided, with a total of eighty-eight column headings. The questions read as follows:

4. a) Which subject(s) are you qualified to teach?

b) List standards/grades and subjects taught by number of periods per week.

Standard/Grade Subject Periods per week

The code list reads as follows:

4a Qualifies Subjects (2x10):

Geography	1
Afrikaans	2
Accounting	3
Business Economics	4
Typing	5
English	6
German	7
Guidance	8
Economics	9
Art	10
Maths	11
Physical Science	12
Commercial Maths	13
Xhosa	14
History	15
Biblical/Religious Studies	16
Home Economics/Domestic Science	17
Biology	18
General Science	19
Health	20
Needlework	21
Woodwork	22
Physical Education	23
Technical Drawing	24
Speech and Drama	25
Computer Science	26
Music	27
?	28 - ?

Subjects Taught (2x10): (as for subjects qualified)

Periods per week (2)

The manner in which the coded information was arranged on the postcoded spreadsheet for this question, with the column heading label format used, resulted in the inability to interpret any meaning from the data. A sample of six responses as they appear coded on the postcoded spreadsheet may be viewed within Appendix B.

3.3.5 Interpretation

Given the manner in which the dataset is structured, it becomes highly questionable whether it is at all salvageable in its current format. Perhaps the most unfortunate reality is that, a year and a half later, it would hardly be worth the investment of time necessary to re-enter the data in a manner conducive to data manipulation.

In response to the four problems within the WCRP which were analyzed as to data which was either missing or unusable, inconsistently arranged, or awkwardly labelled, the following discussion will review one recommended approach toward effectively researching the educational setting for quality data, emphasizing, where applicable, those aspects of the approach which apply specifically to the WCRP.

3.4 WHY THE WCRP WENT WRONG

There is very little, if any, disparity within the literature about the sequential stages of the research process aside from minor variations in detail such as the number of stages the process is divided into (compare, for example, Fraenkel & Wallen, 1993; Hitchcock & Hughes, 1989; Mouton & Marais, 1994; and Postlethwaite, 1992). An explanation of the sequential stages in the research

process as they have been listed by Postlethwaite (1992) serves as the framework for this section. Postlethwaite's work was especially prepared for and presented at a sub-regional training seminar entitled **Data building and data management** held in Harare, Zimbabwe (1992). The context of its content is specifically directed at the poor capacity for quality research within developing countries.

Postlethwaite (1992:11-20) identifies eight sequential stages in the research process:

1) The Research Question
2) Literature Review
3) Research Design
4) Instrumentation
5) Pilot Testing
6) Data Collection
7) Data Analysis
8) Research Report

Each of these stages are, first, summarized in brief and, second, where applicable, discussed more fully in conjunction with the preceding analysis on where the WCRP went wrong.

Stage 1) The Research Question

This stage can be considered the most crucial in that it determines the focus of what will be researched.

Given the information presented within the literature review, a preliminary evaluation of the WCRP determined that it did articulate what it was going to research and, from that point of view, set about that task in an acceptable manner.

Stage 2) Literature Review

Postlethwaite summarizes this stage as a "distillation" of all the accumulated findings to date with respect to the selected area of research; the purpose of the literature review is to glean what is already known insofar that it may contribute to the research project, which can in turn add to, or further extend, the existing body of knowledge.

It is difficult to verify if a literature review was ever conducted for the WCRP. As a pilot study intended for a "nationwide investigation exercise" (WCRP, 1994), a relevant literature review could well have served to specify what data to collect, as well as to suggest how best to collect, analyze, and interpret that information in the most efficient, effective manner (Ross & Mahlck, 1990:53), possibly averting the fate suffered by the WCRP.

Stage 3) Research Design

This stage entails the overall approach by which a given research project will be implemented:

- which type of research would be appropriate (historical, descriptive, correlational, etc.)
- which units are to be the focus of the data collection (students, teachers, administrators, etc.)
- which techniques are to be employed to collect the data (observation, interview, questionnaire, etc.)

From the evidence provided within 3.2 OVERVIEW OF THE WCRP, a research design appears to have been clearly established at the onset of the WCRP. Yet the failure of the WCRP to produce any results whatsoever ultimately implicates a

research design fault. In retrospect, it may now be possible to conclude that between the intended scope of what the WCRP set out to accomplish and certain aspects of the research design as it was employed (given the earlier analysis of the WCRP dataset), too much information may have been inappropriately collected. This situation may have culminated into what Ross and Mahlck (1990:83-84) identify as collecting too much information "in great detail, less concerned with minimal data needs than with maximal ones," noting that "[a]s one addresses more detailed and finer grained aspects, they become more difficult to specify and measure."

Stage 4) Instrumentation

The instrumentation of a research project is the development and use of device(s) to collect the data (for example, observation schedule, interview schedule, questionnaire schedule, etc.).

A listing of the instrumentation used for the WCRP was identified within 3.2 OVERVIEW OF THE WCRP. From what can be derived from the compiled data suggests that, in and of themselves, the instruments were relatively fault free in that they were successful in collecting the intended data. Most of the problems identified have stemmed from a point following the instrumentation.

The alpha-numeric labelling on the instruments was unnecessarily problematic as a minor alteration could have rectified the problem following an effective pilot testing. Although the scope of this report limits a detailed account of the WCRP's instrumentation, the instruments nevertheless

appeared to be sound insofar as they generally complied with the criteria of being:

- clear in terms of the information sought from the target population;
- comprised of many open-ended questions and, in the event of a close-ended question, providing for adequate choices that would discriminate among respondents; and
- labelled "with identifying numbers for linking the different sources of data" (Ross & Mahlck, 1990:108) (however, this report contests the appropriateness of the particular labelling format used).

Stage 5) Pilot Testing

This process is meant to "de-bug" both the instrumentation (for ambiguities threatening either the validity or the reliability) and the procedures for data collecting, compiling, and cleaning as well as the merging of files.

Little is known about how extensive or thorough the pilot testing of the WCRP was other than the fact that the instrumentation was pilot tested. Beyond that, the key question becomes whether the pilot testing was extensive or thorough enough. The answer, unequivocally, is no, for the more obvious reasons that:

- a system for merging the pilot test files was obviously never developed based on the fact that the files were all lumped together;
- the alpha-numeric labelling of the schedules would undoubtedly have been simplified;
- if pilot test data ever was compiled, it is unlikely it was cleaned based on the fact that the problem of out-of-range values was partially responsible for the difficulties associated with data manipulation; and

- if pilot test data ever was compiled, no follow through attempt was made to manipulate it based on the fact that the WCRP dataset is confusing, intricate, and difficult to use.

Ross and Postlethwaite (1992) recommend the following steps to successfully pilot test a research project:

i) trial administration of the instrumentation;
ii) assessment of problems encountered in the administration of the instruments as well as those problems encountered by respondents with respect to particular questions, terms, sections, etc. of the instrumentation;
iii) entering the pilot test data;
iv) analysis of the pilot test data; and
v) finalization of the instruments.

The evident lack of having neither extensively nor thoroughly enough completed steps iii, iv, and v in the pilot testing of the WCRP has, for the most part, resulted in an impotent dataset that would unjustifiably require, a year and a half later, a prohibitive amount of time to rectify the compilation problem.

Stage 6) Data Collection

This stage refers to both the application of the instruments to the target population as well as the compilation of the data into a format (i.e. entered, cleaned, and merged) that will enable data analysis.

The application of the WCRP instruments to the target population does not appear to have been problematic. However, with respect to what Ross and Mahlck (1990:109) refer to as the "management of data collection," little

evidence exists for the potential of the subsequently collected data of the WCRP to

> be involved and intimately interconnected in the sense that it . . . [is possible] to link each student's data with data describing his/her own classmates, teacher, school principal, parent, and community leader.

Poor management of data collection, according to Ross and Mahlck (1990), is linked directly with each of data coding, data entry, and data cleaning. With respect to each of these, most of the problems cited earlier with respect to the WCRP dataset could have been averted in view of the recommendations provided by Ross and Mahlck (1990:116-119).

Data coding should include:

- an accurate reproduction of each question within the code list
- a list of the answers that are possible (i.e. range of acceptable values)
- an explanation of the missing data codes that are to be used
- the provision to "collapse" highly detailed classifications into a smaller number of categories

Data entry should include:

- numeric codes
- a clear distinction between the various forms of non-response
- a value other than zero to indicate non-response
- a "check digit" inserted every 10 or 20 columns in order to permit a visual check of data alignment to be made rapidly from the print-out

And data cleaning should include:

- a series of preliminary analyses of the data in order to look for errors, omissions, etc. and then the results of these analyses should be accordingly employed to edit the original data file, noting in particular:
  - differences between the number of entries recorded on the computer file and the number of instruments

  - out-of-range values
  - consistency irregularities
  - mismatches between data collected at different levels
- a "conditioning" program through which the data is run that either sets the values of imperfect composite variables to missing data according to pre-specified rules, or creates an imputed value for an imperfect composite variable

Stage 7) Data Analysis

Postlethwaite identifies three forms of data analysis:

- univariate (descriptive statistics)
- bivariate (calculation of the association between two indicators)
- multivariate (calculation of the relationship among more than two indicators with the added potential to determine causal relationships)

As the issue has by now been raised many times, not only has a data analysis not been attempted to this point in time (October 1995), but the WCRP dataset as it exists virtually circumvents any possibility of a data analysis ever being properly conducted.

Stage 8) Research Report

Postlethwaite identifies three major types of research reports, based on their intended readership:

- for other researchers (consisting of great detail to illustrate all of the research project specifics);
- for senior policy makers (an executive summary of approximately 5 pages in length); and

- for the public, teachers, and university audience (an easily understood and digestible form of 50-100 pages).

In short, a report has not yet been submitted on behalf of the WCRP. A year and a half has passed since a report was scheduled to have been submitted. It is probably safe to conclude that any momentum that was ever associated with the WCRP has long since dissipated.

3.4.1 Interpretation

Postlethwaite (1992:11) insists that in order "to proceed in a focused and a systematic manner, . . . specific research questions . . . [must] indicate exactly which target populations and which variables or factors should be included in the research study." And yet the analysis within this report suggests two things about the WCRP:

- it did develop specific research questions to indicate exactly which target population and which variables or factors should be included in the research study; but,
- it did not proceed in a focused and a systematic manner.

One logical conclusion to follow therefore, as a result of the analysis of the WCRP, is that there needs to exist "a functional relationship between project outcome and 'conceptualization of the planning process itself'" (quoted in London, 1993:267).

4.0 CONCLUSION

> Only by being clear about one's theories and the effect external constraints have on their operationalization and testing can each individual know where to draw the line and avoid the trap of turning out trash and having, for political reasons, to call it effective (Butman & Fletcher, 1974:46).

According to Ross and Mahlck (1990:12), researching the educational setting for quality data requires "the development of sound techniques for measuring, testing, and costing the conditions and provisions that are likely to result in the occurrence of beneficial change." The alternative is to depend on a series of "short term crisis management models . . ." instead of developing "long-term planning strategies that will allow the transition of education systems from the present to the future to proceed in an orderly fashion based on informed decisions" (Ross and Mahlck, 1990:12). From the inception of a research project through to its conclusion, conceptualization plays a central role, encompassing both what information should be collected and how that information should be collected, analyzed, and interpreted to the benefit of the appropriate decisionmakers; educational research "lack[ing] a clear theoretical framework . . ." inevitably leads to "conclusions [that] are vague and recommendations [that are] ad hoc" (Dhingra, 1991:10).

The failure to conceptualize the details of a research project often manifests itself in the treatment of the data; "[p]roblems with the treatment of data cause failure to meet production schedules more often than any other

evaluation activity" (Bertram & Childers, 1974:198). Ross and Mahlck (1990:100) maintain that although "there are no 'shortcuts' to achieving high standards in these areas . . . there are many easy ways to ensure that standards are low and that the results of the data analyses are meaningless."

Unfortunately, conceptualization is often blurred;

> amid the collage of educational research . . . models, systems, paradigms, and schemata-each replete with its particular set of assumptions, logic, boxes, charts, arrows, and triangles-. . . there is a common and ever-present need to assure that certain qualitative standards are met (Walker, 1974:232).

Amid this collage of factors, conceptualization is further challenged with the responsibility of "a quality assurance strategy . . . [to] simultaneously maintain both a micro and macro focus" (Walker, 1974:237) throughout a research project. The result of too narrow a focus is likely to result in doing the wrong thing right while too wide a focus, conversely, is likely to result in doing the right thing wrong.

Conceptually, the WCRP may have been too ambitious with regard to the number of schedules and the number of questions per schedule. Or perhaps it lacked either the necessary attentiveness to detail or, from the onset, clearly established research project objectives. Such are the conclusions that inevitably arise on the basis of the following observations:

- not all of the intended data to be collected was collected;
- not all of the data that was collected was compiled;
- the present spreadsheet organization does not facilitate data manipulation for the purposes of frequency generation (i.e. patterns, trends, etc.); and

- the compiled dataset remains an extremely unwieldy product.

Most tellingly, the fact remains that one and a half years later a report on the findings has not materialized (WCRP 1994 source documents indicated the intention to submit a report May 31, 1994), not to mention that the 18 schools involved have not been provided with any school profiles from the WCRP (as they were promised). Hopefully the WCRP experience will not deter those schools from becoming involved with other well-intentioned research projects in the future.

That the WCRP has not reached the stage of employing analytic methods designed specifically for multilevel data may be due to the lacking "establishment of a clear conceptual framework that elaborates the linkages between educational information and the quality of education" (Ross & Mahlck, 1990:11).

5.0 Summary Recommendations

The five recommendations to follow summarize a number of generalizations from this report. The first recommendation is the most general in nature and applies to researching the educational setting for quality data. The four recommendations that then follow are less general and refer to more specific aspects of the research process. The context for these summary recommendations is found within Planning the quality of education: The collection and use of data for informed decision-making, edited by Ross and Mahlck, 1990, for UNESCO: International Institute for Educational Planning. They recommend "*a complete reconceptualization of what information should be collected in order to assist with planning the quality of education*" (1990:159) by way of establishing:

- what information is actually being used by decisionmakers; and
- how this information should be most effectively provided insofar as it contributes to the planning of quality education by decisionmakers.

5.1 For the purpose of this report, the practical implications of the above recommendation have been interpreted to include the following recommendations (adapted from Ross & Mahlck, 1990:82):

a) the relevant decisionmakers need to be identified and inquired of as to what their information needs are of the education system

b) the type of information should then be identified with respect to its appropriateness

c) the measurement, data collection, compilation, and distribution of the research project should be systematically developed

d) **the information should be formatted such that it is both meaningful and accessible to decisionmakers**

e) **the research results should be delivered in a timely and accurate manner**

The general thrust of these recommendations are further summarized in Wilcox (1992:153):

> Information which is specifically targetted towards user requirements and appears quickly and promptly is to be preferred to that which is of general interest and produced only after a substantial period of time.

5.2 It is imperative that the scope of the data collection be appropriately determined. The tendency, more often than not, is to engage in what is referred to as "shotgun" research (Wolf, 1993:39); repeatedly, researchers lose "sight of the simple dictum: one must gather information that will assist [educational] program improvement" (Baker, 1974:56-57) in favor of the following rule: "[i]f some data are good, then a mass of data is better (if not merrier)." The collecting of information because it might be useful, beyond that which is to be used, prompts Wolf (1993:39) to suspect that the research objectives may not be entirely clear: "[r]eaders of research reports should generally be suspicious of studies that collect information on large numbers of variables. . . ." Furthermore, the "more clearly information needs and time-scales can be expressed, the better will be subsequent decisions concerning . . . [research] design and methods" (Wilcox, 1992:117).

5.3 It is also imperative that data collection, analysis, and interpretation standards are vigilantly monitored and maintained. Otherwise, "all efforts put into the conceptual design of an educational information system are wasted because . . ." (Ross and Mahlck, 1990:162-163):

- the results of the data analysis are meaningless;

- the results are presented in an unsuitable format for decisionmakers; or
- the results are formulated so late (if at all) as to negate their usefulness for current decisionmaking.

5.4 A particularly efficacious measure toward researching the education setting is the use of computer software packages in the form of data entry programs (Ross & Postlethwaite, 1992) **and statistical packages** (Ross & Mahlck, 1990). Given the nature of contemporary research practices to view the educational setting as multidimensional, it is imperative to be equipped with as many means as possible to effectively "multi-factor causation . . . [as] there is rarely one cause for a particular phenomenon" (Ross & Mahlck, 1990:159). Data entry programs are invaluable for two reasons:

- because a specified range of acceptable values may be entered, they prevent out-of-range values from being entered at the time of data entry; and
- they readily store the data in a data base format for analysis application.

The use of statistical packages, too, greatly enhances the capacity for research analysis, particularly as they can be customized toward a variety of applications.

5.5 The last recommendation with respect to increasing the success rate of research projects intended to research the educational setting for quality data includes the appointing of an advisory committee (Bertram & Childers, 1974). Such a committee might assume the responsibilities to monitor for progress and problems (i.e. the collection, analysis, and interpretation of data), or otherwise act as a checkstop for projects that may be not functioning properly or may be steering off course. They may be instrumental in averting catastrophes such as research projects either failing to progress toward completion, or worse yet, producing poor quality data.

APPENDIX A

Method of Calculation for Percentage of Unusable Data:

In the case of the School Observation schedule for example, the percentage of unusable quantitative data is recorded as being **9.2%**. This percentage was obtained by multiplying the total number of quantitative questions (**27**) by the total number of School Observation schedules (**17**) to obtain the total possible number of responses that should have been collected (**459**). The percentage of unusable quantitative data was then calculated by dividing the number of either incorrect or missing responses (in this case **42**) by the total number of School Observation schedule responses that should have been collected (**459**) (i.e. **42 / 459 = 9.2%** unusable quantitative data).

This same method was used to derive the percentage of unusable qualitative data (i.e. **57** unusable responses / [**17** School Observation schedules x **25** qualitative questions] = **13.4%** unusable qualitative data).

Total unusable data was likewise calculated by dividing the total number of unusable responses (i.e. unusable quantitative and qualitative responses combined [**42** and **57**]) by the total number of possible responses (i.e. **99** unusable responses / [**17** School Observation schedules x **52** total questions] = **11.2%** total unusable data).

APPENDIX B

Six sample responses to Question 4b of the Teacher Questionnaire as they appear within a total of 88 columns on the postcoded spreadsheet:

Sample:	s(1)	s(2)	s(3)	s(4)	s(5)	s(6)	s(7)	s(8)	s(9)	s(10)	s(11)	s(12)	s(13)	s(14)	s(15)
	4(B)1(I)A	4(B)1(I)B	4(B)1(I)C	4(B)1(I)D	4(B)1(I)E	4(B)1(II)A	4(B)1(II)B	4(B)1(II)C	4(B)1(II)D	4(B)1(II)E	4(B)1(II)F	4(B)1(II)G	4(B)1(III)A	4(B)1(III)B	4(B)1(III)C
1	7	8	9	10											
2	6				7							8			
3	10				9							8			
4	10				9										
5	7														
6	-9999.99				-9999.99										

Sample:	s(16)	s(17)	s(18)	s(19)	s(20)	s(21)	s(22)	s(23)	s(24)	s(25)	s(26)	s(27)	s(28)	s(29)	s(30)
	4(B)1(III)D	4(B)1(IV)A	4(B)1(IV)B	4(B)1(IV)C	4(B)1(IV)D	4(B)1(IV)E	4(B)1(V)A	4(B)1(V)B	4(B)1(V)C	4(B)1(V)D	4(B)1(V)E	4(B)1(VI)A	4(B)1(VI)B	4(B)1(VII)A	4(B)2(I)A
1															4
2		9					10								10
3		7	7	7											1
4															3
5															14
6															6

Sample:	s(31)	s(32)	s(33)	s(34)	s(35)	s(36)	s(37)	s(38)	s(39)	s(40)	s(41)	s(42)	s(43)	s(44)	s(45)
	4(B)2(I)B	4(B)2(I)C	4(B)2(I)D	4(B)2(I)E	4(B)2(I)F	4(B)2(I)G	4(B)2(I)H	4(B)2(I)I	4(B)2(II)A	4(B)2(II)B	4(B)2(II)C	4(B)2(II)D	4(B)2(II)E	4(B)II(F)	4(B)II(G)
1	4	4	4						10						
2									1						
3									3						
4															
5									27						
6															

Sample:	s(46)	s(47)	s(48)	s(49)	s(50)	s(51)	s(52)	s(53)	s(54)	s(55)	s(56)	s(57)	s(58)	s(59)	s(60)
	4(B)2(II)A	4(B)2(III)B	4(B)2(III)C	4(B)2(III)D	4(B)2(IV)A	4(B)2(IV)B	4(B)2(IV)C	4(B)2(IV)D	4(B)2(IV)E	4(B)2(V)A	4(B)2(V)B	4(B)2(V)C	4(B)2(V)C	4(B)2(V)D	4(B)2(VI)A
1										10					
2	10				10										
3	1				33	33	33								
4	16														
5															
6															

Sample:	s(61)	s(62)	s(63)	s(64)	s(65)	s(66)	s(67)	s(68)	s(69)	s(70)	s(71)	s(72)	s(73)	s(74)	s(75)
	4(B)2(VI)B	4(B)2(VI)C	4(B)3(I)A	4(B)3(I)B	4(B)3(I)C	4(B)3(I)D	4(B)3(I)E	4(B)3(I)F	4(B)3(II)A	4(B)3(II)B	4(B)3(II)C	4(B)3(II)D	4(B)3(II)E	4(B)3(II)F	4(B)3(II)G
1			35												
2			5						5						
3			8						8						
4			16						16						
5			46												
6			16						27						

Sample:	s(76)	s(77)	s(78)	s(79)	s(80)	s(81)	s(82)	s(83)	s(84)	s(85)	s(86)	s(87)	s(88)
	4(B)3(III)A	4(B)3(III)B	4(B)3(III)C	4(B)3(III)D	4(B)3(IV)A	4(B)3(IV)B	4(B)3(IV)C	4(B)3(IV)D	4(B)3(IV)E	4(B)3(V)A	4(B)3(V)B	4(B)3(VI)A	4(B)3(VI)A		
1															
2	5				7						7				
3	8				18	-9999.99	-9999.99								
4															
5															
6															

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- Introduction & Objectives Statement
- The following seven schedules:
    - School Observation
    - Class Observation
    - Principal Questionnaire
    - PTSA Questionnaire
    - Teacher Interview
    - Teacher Questionnaire
    - Student Questionnaire
- The following documentation accompanying each of the schedules (when included):
    - precoded spreadsheet(s)
    - postcoded spreadsheet
    - code list
    - summary list

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