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# Good practice in educational research : An outline using four paradigms

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# Good practice in educational research:

An outline using four paradigms

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## Abstract

This article employs four different research papers (a case study, an action research project, an ethnography and a quantitative nomothetic study) to illustrate some of the basic concepts which make up sound educational research. Issues such as research design, sampling, data collection, data analysis and validity are all discussed. Particular emphasis is placed in the paper on the need for transparency on the part of researchers when presenting their findings.

**Keywords:** education, research, methodology, qualitative, quantitative

*Research is formalized curiosity. It is poking and prying with a purpose.*  
(Zora Neale Hurston, in *Dust Tracks on a Road*, 1942)

## Introduction

Never before has so much ‘poking and prying’ been carried out in the field of educational research as in these times of desktop publishing, online databases and e-journals. Unfortunately, this increase in the quantity of academic inquiry has not always led to a corresponding level of quality being maintained. This paper therefore aims to provide the novice researcher, who may be thinking about carrying out a study, with an outline of what is good practice when conducting educational research.

The paper begins with an overview of the four quite different research papers that have been employed to illustrate what are good, and not so good, research procedures. These particular studies were chosen because of the variety of aims, approaches and techniques that they provided. All the papers were concerned to some extent with interactions between teachers and students. After this initial overview, the second section considers some issues related to the research designs. For example, problems of subjectivity in qualitative research are addressed,

as are some issues relating to possible ethical concerns. Following on from this, the paper focuses on matters related to sampling and data collection. For example, randomisation and problems with observation are discussed. The paper then goes on to consider various aspects of data analysis in both quantitative and qualitative research. Particular emphasis is placed on the need for transparency in this area. Finally, some issues related to the validity or trustworthiness of educational research are explored.

### Overview of research papers

Chang, W. (2004). *A cross-cultural case study of a multinational training program in the United States and Taiwan.*

Chang's study focused on the influence that national culture had on the development of an international training program. A case study approach was utilised in order to analyse how trainers in different cultural contexts attempted to achieve standardised learning outcomes. Through such methods as observation, interviews and documentation reviews, Chang found that it was advantageous to leave some room for flexibility in the course design as this increased the cultural adaptability of the multinational program. With regards to teaching, Chang's study indicated that instructors in both the United States and Taiwan integrated "the context of the local culture into the curriculum" (Chang, 2004, para. 1) and found it beneficial to incorporate their learners' life experiences into the learning process.

Mok, A. (1997). *Student empowerment in an English language enrichment program: An action research project in Hong Kong.*

Mok's action research project focused on her attempts to empower English language students at a Hong Kong secondary school by giving them more involvement over what they learnt and how they learnt. Working in conjunction with both the school's students and the teachers, Mok implemented an English Language Enrichment Programme (ELEP) to try to improve the students' motivation and exam results. The ELEP attempted to make the school's classes more student centred. Modifications to the programme, which were ongoing, were influenced by data collected from various sources such as interviews, questionnaires and observations. The study found that an increase in the students' empowerment led to them being more interested and motivated to learn English but did not lead to a significant improvement in their test scores.

Ouyang, H. (2003). *Resistance to the communicative method of language instruction within a progressive Chinese university*.

Ouyang's study investigated how and why students and teachers in a pro-reform Chinese university complained about the non-Chinese, native English-speaking teachers who used a communicative language teaching (CLT) approach there. By critically evaluating these complaints, Ouyang hoped to better understand "the extent to which the top-down CLT reform is appropriated, creolised, or resisted at the level of the school community" (Ouyang, 2003, p.123). The study took an ethnographical approach with the author assuming the role of participant observer. Through a variety of qualitative data collection methods, Ouyang found that successful teachers at her university had blended the Western liberal, humanistic approach to education with a traditional Chinese methodology. They had thus appropriated the top-down reform and had given it meaning on their own terms.

Saracho, O. (1998). *Teachers' perceptions of their matched students*.

Saracho's quantitative study investigated how positive teachers' attitudes were to students who had the same particular cognitive style as themselves. The Group Embedded Figures Test was administered to four middle school teachers and 144 seventh and eighth grade students to ascertain if their cognitive style was field independent (FI) or field dependent (FD). The teachers then rated their 'matched' students using a five-point scale on such factors as the degree they liked the student, the concern they had for the student and so on. By using a quantitative methodology which employed statistical analysis, Saracho found that FI matched teachers were more positive in their attitude towards their students than FD matched teachers.

### Issues related to research designs

Educational researchers employ different approaches to research methods in order to suit their own particular needs. For example, the aim of traditional, quantitative research is to generalise and predict. By the use of statistics, this type of research is used to test particular hypotheses. This rigorous approach is illustrated by Saracho's (1998) study in which she used a series of statistical tests to investigate an initial research question. Even so, an over concern for quantitative data may lead to the researcher missing important relationships and links within the educative process (Burns, 1997, p.299). The ethnographic approach, on the other hand, with its more flexible methodology and use of observation is better suited to uncovering such links

and relationships.

Ethnographic research, such as Ouyang's (2003) study, is more concerned with generating and developing theory (Burns, 1997, p.299) than with testing hypotheses. The questions asked by the researcher are constantly modified over time as he/she becomes more aware of what is relevant to the study. It must be pointed out though, that this lack of an initial focus may lead to problems when attempting to gain entry to the research site. Gatekeepers of the site may demand to know specific information, such as interview schedules, that the researcher may not be able to provide (Burns, 1997, p.306).

Ouyang avoided this problem because she was a participant observer who was employed at the research site and therefore did not experience any problems in gaining access. Chang's (2004) case study and Mok's (1997) action research project were also conducted at their places of employment. Only Saracho's (1998) quantitative study was not conducted at her workplace. This fact helps to illustrate that qualitative research is often open to charges of subjectivity. Indeed, Burns (1997) indicates that this is especially true of Chang's approach. He points out that, "It is easy for the case study investigator to allow equivocal evidence or personal views to influence the direction of the findings and the conclusion (Burns, 1997, pp.379-380). Even so, quantitative methods can never be said to be *truly* objective as there is always a certain amount of subjectivity involved in the manipulation and interpretation of statistical data.

As outlined above, different approaches to educational research have an influence on the design and overall aims of the investigations. Ethical concerns may also alter according to the approach taken by the researcher. For example, on the issue of confidentiality and anonymity of the participants, Hitchcock and Hughes (1995) state that to safeguard "...the rights and confidence of the subjects the researcher must use pseudonyms to protect the anonymity of the school, parents, teachers and pupils involved" (Hitchcock and Hughes, 1995, p.51). Ouyang's (2003) study was quite critical of the non-Chinese instructors who worked at her university but no attempt was made to change the name of the institution. This failure to use a pseudonym was ethically questionable as it put the instructors' anonymity at risk.

On the other hand, Mok's (1997) collaborative action research project contributed to a number of positive improvements for the school which took part. The study led to changes in practice in the school which increased student participation and motivation. Therefore, one would have to question Hitchcock and Hughes' assertions and ask whether it is ethically necessary for positive studies, such as Mok's, to have to use pseudonyms for the research site and participants.

## Sampling and data collection

Quantitative research aims to generalise its results to an entire population. Therefore, quantitative researchers need to take care when selecting the sample that they wish to study. Even so, Burns (1997) makes the point that few researchers have either the financial resources or the time to obtain truly representative samples (Burns, 1997, p.78). Some form of random selection is necessary when probability sampling is used. Examples of possible approaches could be cluster sampling, systematic sampling or stratified sampling. Saracho's (1998) study made the common mistake of informing its readers that the sample was randomly selected but failed to enlarge upon how this randomisation was performed. Did she toss a coin? Use a computer program? The reader is left to speculate.

In qualitative research the dilemma of random sampling does not occur. This is because qualitative researchers usually have a particular group in mind that they wish to study. For example, Mok (1997) wished to investigate her own class. This is a very common approach in action research. The same can be said for Ouyang's (2003) ethnographical study. It was the students in her own department which interested her.

This approach can lead to problems though. These are reflected in LeCompte and Preissle's (1993) observation that, "Refusal to participate may be difficult, as in the case of college students whose professors wish them to be subjects of an experiment" (LeCompte & Preissle, 1993, p.67). Ouyang's position as Head of Department does raise questions of how her position influenced the study that she carried out. How honest could her subordinates and students be in their opinions? Good qualitative researchers need to be aware of their own biases and of the influence they may have on their study. In addition to this, it is essential that they make the reader aware of these factors when they publish their research papers.

Researchers often combine various ways of collecting data for their studies. This is particularly true in qualitative research, especially in the case study approach. Burns (1997) states that, "It is a poor study that uses only one source of evidence...The use of multiple sources is a major strength of the case study approach" (Burns, 1997, p.374). This is because it allows for triangulation. The multiple source approach is illustrated by Chang's (2004) study which used observations, interviews, documentation reviews and questionnaires to collect data. Ouyang's (2003) ethnographical study and Mok's (1997) action research project also used multiple methods. These three naturalistic studies highlight that qualitative researchers do not usually place much emphasis on the identification and measurement of dependent and independent variables. This

is in contrast to quantitative, controlled studies such as Saracho's (1998).

Observation can be an extremely useful way to collect data that would be impossible to discover by other means. Potential researchers need to be aware though that the process is not as straightforward as they may at first think. As Nesbit (1977) highlights:

Observation, however, is not a 'natural' gift but a highly skilled activity for which an extensive background knowledge and understanding is required, and also a capacity for original thinking and the ability to spot significant events. It is certainly not an easy option. (Nisbet cited in Bell, 1993, p.109).

Chang (2004), Mok (1997) and Ouyang (2003) all took on the role of participant observer. In keeping with the longitudinal traditions of classic ethnography, Ouyang performed this role for years rather than weeks or months. Although this form of data collection can lead to significant insights into the behaviour of the community being studied, it is not wholly without its dilemmas.

What the researcher observes is very much open to interpretation. Also, it is especially difficult for participant observers to stand back and observe without bias. Cohen and Manion (1989) draw attention to the pitfalls of this particular approach when they point out that its accounts can be, "...subjective, biased, impressionistic, idiosyncratic and lacking in the precise quantifiable measures that are the hallmark of survey research and experimentation" (Cohen and Manion cited in Bell, 1993, p.110). In response to this, one could argue that a researcher being biased is not so much of a crime as the researcher clearly not informing his/her readers of any predispositions. Researchers have to make their readers aware of the particular perspective they adopted when collecting their data. This is true not only for observations but also for other collection techniques such as interviewing.

## Data analysis

Good quantitative research should clearly explain the methods of statistical analysis that the investigator has employed. Although some readers may find the use of statistics daunting when they are attempting to engage with a research paper, it need not be so. If the researcher has clearly explained why particular statistical tests were used and has then presented the results in an easily comprehensible and unambiguous manner, those who are not statistically minded should not experience too many difficulties.

Saracho's (1998) study is a good example of this approach. The results from repeated meas-

ures of multiple analysis of variance (MANOVA), along with the central tendencies and standard deviations were commented upon by Saracho and presented in easy to read tables. She also indicated which results were deemed to be significant in relation to a commonly used criterion (Wilks' Lambda Criterion of  $F = 16.97$ ,  $p < 0.0001$ ). This was good practice on Saracho's part as she did not leave it up to the reader to distinguish what was significant. The study focused on two groups so Saracho performed paired  $t$ -tests and again, presented the results in easy to digest, uncluttered tables. There can be a tendency in some quantitative educational research to present the statistics of everything found, thus overloading the reader with a mountain of statistical data. Saracho did not make this mistake and disregarded results that were not significant.

Whereas quantitative research follows a linear progression of data collection and then analysis, qualitative research tends to see data collected and then analysed in cycles. This means that the research process becomes very dynamic with new theories and questions that need to be asked emerging all the time. Nowhere is this truer than in action research. Lewin's Model of Action Research illustrates the dynamic nature of this approach's two major stages. These are the diagnostic stage where problems are analysed and hypotheses are developed and the therapeutic stage where hypotheses are tested by a consciously directed change experiment in a real life location (Burns, 1993, p.347). Mok's (1997) action research project clearly displayed this ongoing interaction between analysing data and changing practice. Even though Mok lists a wide range of data collection techniques that she used including "group discussion, group sharing, informal conversations" (Mok, 1997, p.311) and so on, one could argue that the actual methods of data collection and analysis in action research are less important than who actually chooses and performs the procedures.

A common problem of qualitative research is that it can produce a huge amount of data that the researcher must sort into manageable units (Hitchcock & Hughes, 1995, p.299). Wiersma (1995) states that, "Data analysis in qualitative research is a process of categorization, description, and synthesis. Data reduction is necessary for the description and interpretation of the phenomenon under study" (Wiersma, 1995, p.218). If one considers that Ouyang's (2003) study took place over three years, one can begin to get some idea of the challenges that she faced in analysing the large amount of data that must have been collected. Unfortunately, Ouyang failed to detail her approach to data analysis in her report. Her study would have benefited had she done this.

Chang (2004) did not make the same mistake. Her case study into the effects of national



culture on a multinational training program went to great lengths to list the methods of data analysis used and, importantly, why these techniques were employed. For example, Chang quotes Strauss and Corbin (1990) to inform the reader that she used open coding as a means of “breaking down, examining, comparing, conceptualising, and categorizing data” (Strauss & Corbin cited in Chang, 2004, para. 27). Some transcripts were coded twice as a method of improving reliability. It was not only Chang’s rigorous approach towards her data analysis that was commendable, but also the fact that she clearly informed her readers of the processes she undertook. Transparency in this respect is vital because a perfect, fixed method for analysing qualitative data does not exist. As Wellington (2000) states, “Manipulating qualitative data during analysis is an eclectic activity; there is no one ‘right’ way” (Wellington, 2000, p.150).

### Validity / trustworthiness

Qualitative researchers tend not to talk about the validity of their research because this term is usually associated with the quantitative paradigm. That is not to say that the goodness of qualitative research cannot be evaluated though. On the contrary, there are many factors which can point to the credibility of the research. One such feature is a prolonged engagement. For example, Ouyang’s (2003) three years spent as a participant observer in her ethnographic study of the English department of her university indicates a much greater degree of credibility than if she had merely spent a couple of weeks at the research site.

Negative case studies can also contribute to qualitative research’s credibility. A study’s trustworthiness increases if it has not merely focused on points to support its arguments, but also on factors that go against its arguments. Mok (1997) included in her report examples of classes in which her action research project failed to produce significantly positive effects on the students’ learning. These admissions contributed greatly to the credibility of Mok’s study.

Although generalisation is often not the aim of qualitative researchers, it is possible to address the issue of transferability through *thick* descriptions of procedures and results. The more information provided about such things as the questions the researcher asked, the context of the study or the socio-economic status of the participants, the greater the level of transferability. Chang’s (2004) case study illustrates what is good practice on this point. Her detailed and clear descriptions of the techniques and procedures that she undertook have resulted in a highly transferable study.

LeCompte and Preissle (1993) state that, “Internal validity is the extent to which scientific

observations and measurements are authentic representations of reality. External validity is the degree to which such representations may be compared legitimately across groups” (LeCompte & Preissle, 1993, p.323). In her quantitative study into teachers’ perceptions of their cognitively matched students, Saracho (1998) would have been well advised to have devoted some time towards addressing these issues. Her failure to tackle the topic of population representativeness put the external validity of her study seriously into question. The internal validity of her study was also unconvincing because she failed to account for possible selection bias and threats caused by history. Good researchers are not only aware of threats to validity, both internal and external, they also admit to them. Indeed, willingness on the part of the researcher to point out a study’s weaknesses and to be self-critical is essential in both quantitative and qualitative research.

## Conclusion

It was not the intention of this paper to argue in favour of one particular research methodology. Due to such factors as constraints on finances, time or word number, no single research paper can ever be absolutely perfect. Indeed, no single research paradigm is flawless. As this paper helps to point out, there are many different approaches to the practice of educational research, each with its own particular pros and cons. What is important to remember though, is that it does not matter whether it is a Hong Kong secondary school teacher trying to improve the English of her pupils or a Chinese university professor trying to comprehend the effects of national educational reform on her department; all these approaches contribute to our understanding of education. One would hope that the efforts of researchers such as those mentioned in this paper can eventually bring about some benefits and improvements, however small. As Wellington so succinctly puts it, “Educational research can make education better. Otherwise, why do it?” (Wellington, 2000, p.183).

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