Types of Approaches Used in Educational Research

Philosophical frameworks describe the assumptions that underlie research. To some extent, your philosophical framework will guide your selection of the type of research approach you will use. The specific approaches used in educational research can be further classified according to (1) the extent to which the findings are applicable to educational settings (e.g., Basic vs. Applied research),(2) the methods used to design the study and to collect data (e.g. Qualitative vs. Quantitative approaches), and (3) how the information is shared (e.g., the dissemination of the findings).

1. Basic versus Applied Research Approaches

The goal of basic research is to design studies that can test, *refine*, modify, or develop theories. *As an example of basic research*, Marcia's (1966) research on adolescent identity *led to a refinement* of one stage of Erik Erikson's psychosocial theory of development. Marcia's goal was not to create a program to address practical ways to help adolescents but, rather, to *extend and support the theory*. *Applied research studies examine the effectiveness and usefulness of particular educational practices*. Here the goal is to determine the applicability of educational theory and principles by testing hypotheses within specific settings. For example, Schmitt-Rodermund and Vondracek (1998) examined whether parenting behaviours predicted the amount of adolescent identity exploration as described by Marcia. Both basic and applied methods of research have their place in the educational research field. To some degree, the approach selected depends on whether the findings are utilized and result in a change in practice. *In basic research, the overarching goal is to develop and modify theory.* These theory-based studies, while critical to the formulation of applied research, often have low utilization and do not result in system wide change. *Whereas the goal of applied research is to demonstrate the usefulness of theories in practice,* the reality is that applied research studies often take many years to stimulate change, even though the findings are disseminated to large groups of individuals through applied research journals.

2. Quantitative Research Approaches

All quantitative research approaches summarize results numerically. However, the approaches differ in their goals and the procedures used to collect data.

2.1. Descriptive Survey Research.

Descriptive survey research aims to describe behaviours and to gather people's perceptions, opinions, attitudes, and beliefs about a current issue in education. These descriptions are then summarized by reporting the number or percentage of persons reporting each response. The survey is the primary method used to gather such data or information from people. A commonly held misconception is that descriptive survey research is an easy method, requiring simple questions and answers. This just is not so. Good descriptive survey research requires thoughtful and careful planning. Like experimental research, this approach is quantitative, and *surveys are typically administered to a random sample of the population to which the researcher wants to generalize the survey results*; however, in contrast to experimental research, *there is no manipulation of variables, and data are not gathered to test a hypothesis*. Therefore, *descriptive survey is considered a nonexperimental approach*. Rather, demographic items (designed to obtain background information on participants) and *survey questions are developed through an extensive review of the literature in the area of study,* and *conclusions are drawn based on participant responses*. Items are subjected to a series of preliminary tests, or piloting, which is essential in order to "work the kinks out" of the survey. Descriptive survey research is the most widely used method of research in education, with an estimated 70% of research falling into this category.

2.2. Experimental Research

The goal of experimental research is to test hypotheses to establish cause-and-effect relationships. For decades, experimental research has been a major approach used in quantitative research. Often when people think about research and what research is, they commonly associate it with characteristics typical of experimental research. The overarching purpose of experimental research is *to determine whether a particular approach or way of doing something is "better" than the "older"* or more traditional approach that has served as the standard practice.(Keep in mind that sometimes experimental research is conducted with hopes that no difference will be found between the two methods or approaches under investigation.) So experimental research is about studying the effect or the impact of an approach under stringent and controlled conditions to make statements of causality. Sometimes, these conditions *involve random selection of study participants from a larger group known as the population*. The population is the larger group to which the researcher would like the results of a study to be generalizable (e.g., fourth graders or high school girls). *Random selection* is a procedure where each and every person in the population has an equal

and independent chance of being selected for the study. *The randomly selected participants constitute the sample*. People in the sample are then *assigned to one of two or more groups that are treated (manipulated) with regard to a specific educational approach or practice or are exposed to different treatments at different points in time*. These differential treatment conditions are called *the independent variable*, which precedes and is assumed to cause a change in behaviour referred to as *the dependent variable*. For example, a researcher might ask, "Does instructional strategy in reading (phonics or whole language) affect reading achievement of fourth graders?" In this study, reading achievement would be the dependent variable, and instructional strategy would be the independent variable. The sample would be a group of fourth graders randomly selected from the population to which the researcher wants to generalize the study results (e.g., fourth graders in an entire school district). Students would be randomly assigned to receive either phonics or whole language, and reading achievement would be measured. The final component of an experimental study is to control extraneous variables. *An extraneous variable is any variable, other than the independent variable that might influence the dependent variable*. In any experimental study, there are many possible extraneous variables. In the study of phonics versus whole language, one would need to consider if the teachers for each class were equally good teachers. *The amount of time spent on reading instruction might also be an extraneous variable.* Differences in student abilities before the instruction begins are an extraneous variable that is controlled through random assignment.

2.3. Causal-Comparative Research

Causal-comparative research, or ex–post facto research, is a research approach that *seeks to explain differences between groups by examining differences in their experiences.* Like experimental research, it examines the effect of an independent variable (the past experience) on a dependent variable while also trying to control extraneous variables. However, unlike experimental research, *the independent variable (the past experience) has either already occurred or it would be unethical to manipulate*. For example, let us say that you are interested in what causes the differences in the readiness skills of kindergarten students. After reading past research studies, you decide to examine preschool attendance as an independent variable that might have "caused" a difference in kindergarten readiness (the dependent variable). Preschool attendance has already occurred or happened; as a researcher, you cannot control or manipulate it. If you were to conduct such a study, you will simply identify two groups, one group that attended preschool and one group that did not, and then

measure and compare school readiness scores. If the groups differ on their readiness scores, the researcher infers that preschool attendance caused the readiness scores to differ. However, caution is warranted. Because no random assignment occurred, the two groups being studied could be very different to begin with, which might mean that other factors and not preschool attendance caused the difference in readiness scores. For example, there may be differences in family income or parental levels of education (or both). Therefore, *making sure that the two comparison groups are as similar as possible on all other extraneous variables (other than the independent variable) is a critical part of designing a causal-comparative study*.

2.4. Correlational Research

Correlational research *is a quantitative method designed to show the relationships between two or more variables*. Correlational research is similar to descriptive survey in that it is nonexperimental, consisting of only one group of individuals (e.g., fifth-grade students) *and two or more variables that are not manipulated or controlled by the researcher* (e.g., reading scores and IQ). The variables are examined to determine if they are related and, if so, the direction and magnitude of that relationship. Simple correlational research *does not seek to show causality* (that one variable is causing a change to occur in another). Rather, *the main purpose of correlational research is to determine, through application of a quantitative statistical analysis, whether a relationship exists between the variables under investigation.* One might make predictions based on these relationships, but not statements of causality. For example, if such a relationship does exist, the strength and the direction of the relationship are reported numerically *in what is referred to as a correlation coefficient*. Scores from this analysis fall somewhere along the correlation coefficient's range of negative 1.00 to positive 1.00. Note that negative and positive do not have any "moral value" attached to them in this context. A highly negative relationship is not a relationship that is bad but one that results from scores on two variables moving in opposite directions: *an increase in one variable is accompanied by a decrease in the other variable being studied*. For example, as absentee rates increase, student achievement decreases.

2.5. Meta-Analysis

Research studies using meta-analysis tend to pose a dilemma for students new to the area of research. This may be because when it comes right down to it, *this type of research statistically summarizes the results of other studies.* Now perhaps you see why so many consider it to be confusing. *The purpose of a meta-analysis is to ask a research question and*

use past quantitative studies as data to answer the question. The data from these studies are reanalysed using an appropriate statistical analysis, and a typical result, usually referred to as an effect size, across all studies is reported.

3. Qualitative Research Approaches

Qualitative research approaches collect data through *observations, interviews, and document analysis* and summarize the findings primarily through narrative or verbal means.

3.1. Case Study

Case study is one of the most common qualitative approaches. Although they are wide ranging in their scope and sequence, case studies typically focus on *small groups* or *individuals within a group* and document that group's or individual's experience in a specific setting (see next section on ethnographic research). In addition, *the gathering of this information or data through multiple sources and perspectives is another key characteristic of the case study approach.* For example, on the topic of parental involvement, a researcher could do a case study on a family or several families who are non-native-English speakers and determine how they are working with the school district and the teacher to help improve their child's academic performance. Some interesting questions the researcher might think about exploring as she or he approaches the study are how do the parents (who are not proficient in English themselves) interface with the school in supporting and working with their child? Do they feel that the school is assisting them, or do they view the school as an obstacle? How do teachers perceive the parents' efforts to help their child? Researchers working in case studies tend to use *interview, observation, and document analysis as their primary tools*.

3.2. Ethnographic Study

Ethnographic studies are often included in the same category as case studies, and for good reason. Where case study researchers focus their energies on the interactions of individuals or small groups in specific settings, *ethnographic researchers tend to investigate how interactions in a cultural group are influenced by the larger society*. Like cases, ethnographic studies also *gather information about the phenomena being investigated from multiple perspectives*. However, in addition to gathering data, ethnographic researchers "*filter" or assess the information gathered through the setting, recognizing that the setting itself has a role and a function in the study*. Ethnographic studies also require that the researcher gain the perspective of the participants, to some degree, by becoming part of the

group being studied. For example, an ethnographic researcher decides to examine a school building within a large urban district and document how the school is trying to deal with issues of diversity. Specifically, the school has been working to increase student awareness of diversity, to heighten student tolerance toward individual differences, to create a learning community, and to infuse multicultural issues into the curriculum. *A researcher who clearly knows the setting and culture and the participants in the setting gathers this information by using interviews, observations, and some document analyses.* However, the researcher also recognizes that she or he *has to be aware of alternative settings or issues that need to be considered* (e.g., diversity of curriculum mandated by the school; interaction between minority students, the police, and the larger community; the interaction between the religious community and the school; and legislation). Whereas the researcher is examining only one building, the larger school district, the community, and possibly the state and nation may play a role in describing "the overall picture."

3.3. Grounded Theory

In grounded theory research, *the researcher uses data gathered through qualitative techniques to develop a theory based on the data*. In essence, *the researcher builds a theory from the "ground" or from the narrative data produced in the study*. Taking the example just used for ethnographic research, a grounded-theory researcher might take the findings of the study and develop a theory of how schools in general might effectively deal with issues of diversity. Let us say that the data suggested that there were four basic components essential to an effective diversity program: developing identity, tolerance training, understanding differences, and building learning communities. The theory then could be based on these principles, and from these principles the researcher would begin to develop a theoretical framework. *As the theory begins to emerge, the researcher returns to collect more data to either confirm or challenge the initial findings*. In some ways, *the grounded theory researcher is attempting to use the findings generated in a particular context and develop a theory that could be generalized to other contexts.*

3.4. Phenomenological Study

Like case studies, phenomenological studies are also a common qualitative approach. *Phenomenological studies attempt to capture the "essence" of the human experience*. Like other qualitative researchers, phenomenologists are interested in recording the individual perspectives of the participants in the study. However, phenomenology stresses the

importance of each individual and his or her respective view of reality. To encourage these perspectives to emerge, *phenomenologists use open-ended interviews as their primary data collection tool*. The phenomenologist's role is to "give voice" to those perspectives. Consider the following: Take a look at the person sitting next to you in class. You both are sitting in the same course, at the same college, with the same professor; yet, the way you perceive the reality of this graduate experience is quite different. You each bring a history of personal experiences, attitudes, behaviours, and emotions, all of which will influence how you view this shared experience. For an example of a published study that used phenomenological methods to study the experiences of women in dance therapy, see Mills and Daniluk (2002).

4. Research Approaches Using Qualitative or Quantitative Approaches (or Both)

Several approaches to research are more flexible in their use of quantitative and qualitative methods. Two of these, program evaluation and action research, may use either qualitative or quantitative approaches or use both in a single study. Mixed-methods approaches, by definition, use both quantitative and qualitative methods.

4.1. Mixed-Methods Research

Mixed-methods research collects both quantitative and qualitative data because these *researchers believe that a combination of approaches results in a more complete understanding of educational problems*. Although one approach might be emphasized more than the other, both types of data are considered essential to the study. *One type of data may be collected first, followed by the other, or both quantitative and qualitative data may be collected simultaneously*. For example, Jones and Kafetsios (2005) studied the effect of war on the psychological well-being of adolescents by collecting quantitative data from a trauma questionnaire and qualitative data through in-depth interviews. The use of two types of data enabled the researchers to better understand both the degree of trauma and the meaning of the wartime experiences to their youth. Widespread use of mixed-methods research is relatively new, and several designs have been developed.

4.2. Action Research

Action research is designed to enhance and improve current practice within a specific classroom, school, or district. Typically, it is a type of research undertaken by practitioners *who have identified problems they wish to solve or who would simply like to find ways to enhance their own teaching or student learning, or both.* In general, there are two types of

action research, critical action and practical action research. *Critical action research, as described by Freire (1970) is research that is collaborative and is implemented to improve the lives of those who are being studied. Practical action research is conducted in classroom or school settings and provides practitioners the opportunity to identify and solve their own educational problems.*

Whichever type of action research is pursued, all action research generally includes a three-step process: (1) *identification of the problem(s) through careful observation and reflection*, (2) *planning and taking appropriate action* (the study), and (3) *using the findings to improve teaching and learning*. This type of research continues to grow in use because educational practitioners find it an empowering and collaborative activity.

4.3. Program Evaluation

The field of education is filled with programs designed to improve both learning and teaching. Examples of these programs include a reading-intervention program designed to help struggling readers or a teacher-training program designed to help teachers integrate technology into lessons. *Program evaluation is designed to attempt to determine the level of success or failure of such educational programs and to make decisions about such programs.* Although program evaluation uses quantitative and qualitative methods, its overall purpose is different from most other types of research. Whereas quantitative and qualitative researchers certainly study programs, findings from such studies typically are slow to change or improve the programs themselves. *In program evaluation, however, findings are often used for ongoing or short-term decision-making purposes, and programs can be changed or "improved" based on the results of a single evaluation*. In some extreme cases, a program might even be eliminated based on such evidence. Most program evaluation approaches use two types of feedback loops for reporting findings: **formative feedback and summative feedback.**

Formative data are collected and provided to program developers as the program is occurring, with the hope that such evidence will support the needed changes. For example, if one is evaluating a new reading program and the instruction is not being delivered according to the program's specific goals, the evaluator would provide this information to the program director so that the instruction could be improved. Although some quantitative researchers use formative feedback loops, it is the potential for action to be taken on the feedback that makes program evaluation distinct from quantitative approaches. For example, experimental or

quasi-experimental researchers would not dream of altering the program or treatment (the independent variable) as it was being studied. After all, if the study showed an increase in student performance, to what could the results be attributed? The program before the improvements? The program after the improvements? A combination of the two? In addition to collecting and providing formative feedback, program evaluation researchers attempt to collect summative data. *Summative data focus on determining whether a program's goals were met*. Examples of summative data are changes in students' reading scores, number of people served by the program, and job satisfaction ratings. *Program evaluators tend to use both formative and summative information in identifying areas in need of improvement and in determining a program's success or failure.*