Chapter 19
An Introduction to Educational Research

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ABSTRACT
Within the field of educational research, there are several methods, approaches, and concerns a potential researcher must be made aware of. This chapter serves as an introduction to the process of educational research, and as such, is intended for novice researchers seeking to gain an overview of the process of envisioning, designing, and carrying out a successful research project. Further, this chapter addresses the kinds of research that are possible within the academic field, some of the ethical and practical considerations involved in human subject research, and best methodological practices. Four major methods of research are discussed: qualitative, quantitative, mixed methods, and action research. Each method is provided with information on the subtypes of research within each area, appropriate methods of data collection and analysis, and acceptable formats for reporting results for each methodological type.

INTRODUCTION
The purpose of this chapter is to provide a brief introduction to major topics in the field of educational research and the general steps in the research process, including major types of research, an overview of research ethics, and the various methodologies. This chapter examines major methods of research such as qualitative, quantitative, mixed methods, and action research, including the characteristics of each, the types of questions and situations in which each is most appropriate, and general formats for reporting the results of each type of research. Technology leaders and others must understand the appropriate conduct of research in order to be able to effectively and ethically explore issues and expand the body of academic knowledge.

A technology leader may face many decisions and situations that may precipitate the need for performing research. A school may receive a grant to pilot test computer-aided learning programs. In this scenario, a district may ask the technology leader to gather information to help them decide...
between two or more competing technology-based learning products such as interactive whiteboards, tablet computers, or even augmented learning technologies. Technology leaders are frequently responsible for training staff and faculty in the use of technology, and research can help technology leaders determine the effectiveness of that training.

This chapter provides only an overview of the research field and does not serve as a comprehensive exploration of the topic. For further exploration, there have been entire textbooks written about each of these topics that one can review. However, this chapter can serve as an introduction by providing foundational context and resources for further study.

EDUCATIONAL RESEARCH FOUNDATIONS

Educational research includes all forms of study, observation, and experiment undertaken for the sake of understanding, improving, or gaining insight into any aspect of education. The research can range from random-selection studies of the effectiveness of educational software, programs, and interventions undertaken by universities or large corporations to individual action-research projects undertaken at the classroom level by a single K-12 teacher. Educational research can be divided into basic and applied research. According to Johnson and Christensen (2008), “Basic research is aimed at generating fundamental knowledge and theoretical understanding . . . Applied research is focused on answering real-world, practical questions to provide relatively immediate solutions” (p.11). Experimental research is generally basic in nature, while action research is, by its nature, applied.

As its name would imply, educational research generally deals with topics of learning, instruction, and motivation. When approached by a technology leader, the aforementioned topics will likely be related to various technological aspects of the educational process such as distance learning, educational video games, multimedia presentations, interactive whiteboards, and computer-aided instruction.

STEPS FOR CONDUCTING EDUCATIONAL RESEARCH

This section serves as an introduction to the steps involved in conducting educational research. This would include determining a research topic and research questions, conducting a review of the relevant literature, selecting appropriate research methods, collecting and analyzing the data, and finally, reporting the results of the research.

Selecting and Determining a Research Topic

Experience, observation, and existing literature should guide the choice of research topics. Situations encountered in the researcher’s life, work, and professional readings may raise questions for which a fitting answer cannot be found. These unanswered questions are often the best sources for research topics. Additional sources of research problems include practical problems observed in the researcher’s area of practice and questions raised, but not yet addressed by previous research, either that done by the researcher or done by others (Johnson & Christensen, 2008). For example, a teacher, technologist, or administrator at an elementary school that has adopted, or is considering adopting, a new reading program might want to know if it works better than what they are already doing. If he or she cannot find any evidence in the literature (disregarding the advertisements put out by the company that is selling the new reading program), then the effectiveness of the new reading program may be a good topic for research. Such instructional questions serve as the basis of research problems that require further exploration. Research topics should be relevant...