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Under Review: Researching Technology Education: Methods and Techniques by Howard Middleton

Michael P. Glass
Old Dominion University

BOOK REVIEW

Middleton, H. (Ed.). (2008). *Researching technology education*: *Methods and techniques.* Rotterdam, The Netherlands: Sense Publishers. $49.00 (paperback), 228 pp. (ISBN-10: 9087902603).

Abstract

Neophyte researchers in technology education or those looking for new methods to examine their core research issues will find an interesting mix of approaches for qualitative research studies in the collection presented by Howard Middleton in *Researching Technology Education*, (2008). Readers may detect a somewhat English spin to this collection since most of the contributors are from Australia or the United Kingdom. This international view emphasizes that technology teacher education and research are issues for countries across the globe. The chapter written by Richard Kimbell on Design Performance: Digital Tools: Research Processes provides an excellent description on anticipated and unexpected outcomes researchers using technology to assist in their assessments may encounter. This chapter alone may be worth the price of the book.

This collection of research techniques presented in, *Researching Technology Education: Methods and Techniques* (Middleton, 2008), points out "…that to understand technology education we need to use research methods that are appropriate for technology education" (p. 1), and presents several innovative tools for the researcher to consider. Researching Technology Education promises to make the

Reviewed by Michael P. Glass. He is a Ph.D. student in Occupational Studies at Old Dominion University in Norfolk, VA. He can be reached at **mglas008@odu.edu.**

technology educator more proficient in various methodologies which is as important as performing the actual research itself. Case studies, comparative analysis, researching design performance, application of the reparatory grid technique and researching expertise development are presented, according to the author, because, "the tools available determine what can be researched" (p. 2).

Lest the reader get lost in the various methodologies or purpose for this collection the introduction first describes the four purposes of this text.

1. Research methods will help educators write research proposals
2. All methods presented in this text will help in understanding knowledge and learning in technology education
3. Process is more important than content
4. The methods presented are appropriate for technology education

Each of the eleven research articles is summarized by Middleton along with a short explanation of why he selected the particular article. The collection of work presented covers various methodologies which provide a widespread of relevance and applicability to the goals of the text established by the author.

Middleton leads off with a strong qualitative analysis methodology for classroom case studies presented by Robert McCormick. McCormick (2008) provides the technology educator with a justification and understanding of this methodology by explaining how classroom case studies can be used to explore the *nature of knowledge*, the *use of knowledge,* the *social or moral issues* of knowledge followed by the *teacher's role* in and the strategies for dealing with these issues in the classroom. Starting with a background on case studies which leads into how to address design issues of external validity, construct validly, reliability and internal validity, a strong foundation is laid prior to examining the role of the researcher, ethics along with the strengths and weaknesses of classroom case studies. One would be hard pressed to argue that McCormick failed to meet the goals of this text.

The next article falls short of meeting both the goals of the book and the premise of the article of, *Developing Professional Thinking for Technology Teachers*. Banks (2008) using reminds the technology teacher of the importance of pedagogical and subject/content knowledge before introducing the concept of "school knowledge". This later type of knowledge is inherent to the particulars of the individual institutions and its common practice in the teaching of the subject(s). Using a Venn diagram developed by other researchers which illustrates the intersection and overlap of school knowledge, subject knowledge and pedagogical knowledge a group of thirteen student teachers in their final year at their university are asked to describe the importance of each type of knowledge in one of their courses. Surprising enough, all the students found the same framework provided by their professor, useful in describing their field experience. Given the suggestion by their professor that they could use the framework, one should not have been surprised that all of the students chose to follow his example. One might conclude that the behavior of the students could have been predicted but not the researchers in this study. So that the reader is not left wondering if these phenomena which appear to be some sort of Pavlovian condition response, where good grades are the student's reward for addressing all elements of the framework, could be duplicated in other schools a similar test is performed with multiple schools. The results in the multi-site study were much the same with the student teachers using the same framework presented by their professor to explain their teaching experience. To demonstrate that this was not a local or regional phenomena but one that could have transferrable possibilities, a multi-international site test was performed; similar number of student teachers resulted in similar results.

One is left wondering if using technology teachers with various levels of experience who had no direct tie to the research would have resulted in use of the same framework. Could there have been some inherit bias due to the student teacher-professor relationship? The assessment of technical competency emphasized by Zane (2008) and Testa (2008), along with development of "reflective practitioners, social critics and good citizens," (Star & Hammer, 2008) might

provide a better insight into student teacher learning and attitudes than reciting or paraphrasing lessons learned in school.

Using self declared experts [Note: The expertise was verified by having them perform tests for the researcher]. Chester (2008) presents another methodology that is designed to determine the range of metacognitive processes used in constructing 3D-CAD models. Using the video capture of experts, the author points out technology instructors can replay the results with commentary and expert audio comments to facilitate the mastery by students of complex skills. In discussing one of the characteristics of an "expert" Chester indicates "…the inability to verbalize the 'know how' or procedural knowledge because much of it is tacit" (p. 47). This observation calls into question utility of verbal reports and think-aloud protocols discussed in researching expertise in complex computer applications (p. 73).

Measurement of mastery of skills by technology teachers is called into question by the methodology presented in Project E-Scape described by Kimbell (2008). In presenting the process, data and statistics for testing the model used in design performance Kimbell immediately established the credibility of his approach in dealing with the issues of reliability, validity, and manageability (p.110-113). Web-based portfolios were evaluated by judges who searched for voice, understanding and comments/reflections that suggested contemplation or thinking. Challenges of evaluating content and thematic analysis, along with the use of comparative analysis is examined (p.113-127), and logical frameworks are presented but no technology tools are identified for the technology educators who may be intrigued by the studies presented. One such tool to consider is a software product from Content Analyst (2008), which uses samples of relevant studies to compare documents/ portfolios to determine the coherence or content of the collection. This sort of tool eliminates the subtle, inherent bias or variability of all human subjects by researchers.

No recipes for research proposals are presented, nor will the reader find that all methods are appropriate for technology education but technology educators who are searching for different views or

methodologies which might be applicable to their research will find this collection worth purchasing.

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