**September, 2007 - Kathy Safford, Mathematics**

## Research Tip

### Introduction

From October, 2005 through April, 2007, I was the co-project director of a United States Department of Education project that studied adult numeracy education in the United States. Funded by the Office of Vocational and Adult Education (OVAE) and contracted to the American Institutes for Research, the project served to benchmark the state of numeracy research globally as well as inventory innovative programs within the US, particularly those that incorporated professional development for their instructional staff. Participation in the project was a novel experience as I had never before conducted research that I had not conceived and proposed. At times it was also a frustrating experience since the funding agency had to approve the final reports resulting in conclusions that were not necessarily those that I would have drawn. So my first tip would be a warning that one does not have complete control of externally initiated research projects. There were several tasks within the project. These research tips will address two of them: the literature review and the environmental scan.

### Literature Review

It is very important to develop a clear definition of "acceptable research" before beginning a literature review. As a first step, the project team must determine how many years back they want to go in the search. For educational research, 20 years is a common timeframe. In faster moving disciplines like biology or physics that might be too long. Next, a definition of "research" needs to be agreed upon. This is not as easy as it might sound. Within the academic community, the value of qualitative versus quantitative research is debated. It is a particularly sensitive subject where the federal government is concerned. The current federal administration puts great emphasis on evidence-based research where quantitative measures are implicitly, and often explicitly, intended. The educational community, on the other hand, values qualitative studies with the rich depth of information that they frequently provide.

The acceptable number of participants in the study must be resolved. In quantitative work, the larger the numbers, the more respected the results. Qualitative work, on the other hand, often has a limited number of participants studied over an extended period of time or via repeated interviews. Finally, the institutional location of the participants must be ascertained. For our study, one of adult basic and secondary mathematics education, we were allowed to extend to research from developmental education on the collegiate level because the material was similar although the ages might not be the same. In the end, the negotiated definition of acceptable research for the *Adult Numeracy Initiative* was that it conducted empirical research on instructional interventions, included adults in ABE or developmental classes, was conducted between 1985 and 2005, had

outcomes related to learning mathematics, had a comparison group, and included at least five students per group.

Locating studies is not a simple task. The overwhelming majority of researchers in adult numeracy conducted their work as dissertation research but failed to publish the results separately in peer-reviewed journals. *Dissertation Abstracts International* has a substantial subscription fee and must be accessed in a research university library. Using a Boolean search on subjects, not keywords, is the best way to identify the dissertations that apply to your topic. For our work, the arguments "adult" and "mathematics" and "education" zeroed in on candidates for the study. Once the abstracts have been reviewed and specific dissertations selected, the fastest way to obtain copies of the works is to journey to the Library of Congress in Washington. They have microfilm copies of virtually every dissertation published and electronic copies of everything since 1997. You can e-mail yourself the electronic copies of dissertations that you believe are useful, download them, and review them back in New Jersey.

To identify journal articles, The American Institutes for Research staff searched research databases (Proquest, ERIC, EBSCO, MATHS4Life, NALD, and Reference Manager) and generic Web sites such as: Google.com, Yahoo.com, MSN.com, Askjeeves.com, Webcrawler.com, Altavista.com, Excite.com, and AOL.com). They also visited numerous national and international mathematics - and numeracy - related Web sites to try to identify additional adult numeracy/mathematics related sources. This was an enormous undertaking requiring weeks of work on the part of the researchers. Anyone planning a similar undertaking is warned to allow adequate time and personnel for the task or plan to limit their search, probably restricting the results. The discouraging side of our effort was the fact that, in the end, only 15 of the located studies met the criteria of "acceptable research."

**Environmental Scan**

The other task involving extensive research was the environmental scan, an attempt to identify all investigational adult numeracy projects in the United States. The Internet was again an enormous aid. I began by visiting federal websites and reviewing grant awards from the previous ten years. The addresses of the adult education directors from the individual states were found through the web as well as a detailed description of the various types of professional development that were common in adult basic education. We were also able to query colleagues via listservs that are moderated by the National Institute for Literacy (NIFL) to identify projects that had failed to appear in the other searches. In all, thirty potential candidates were found.

Just as we needed to define acceptable research for the literature review, the project team had to develop criteria to determine whether the candidate projects merited in-depth analysis. A committee consisting of the team and twelve experts from mathematics and adult education honed a set of criteria that described essential and desirable characteristics. Again, the Internet proved invaluable as

the participants were spread across the country. Eventually we hammered out a list of seven essential and three desirable criteria, the application of which yielded twenty programs that were ultimately scrutinized.

**Conclusion**

The experience of dealing with a large government agency was at times frustrating but I am glad that I participated in this project. I learned new tools for research and my writing style was refined to satisfy a different audience than I was accustomed to addressing. I had the reward of contributing to a project that was sorely needed in my research area of adult mathematics education. Finally, my name and that of Saint Peter's is now prominently displayed on two major US Education Department reports available via the web.