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Review of the Technology Education Research Conference (TERC), Surfer's Paradise, Australia

Philip A. Reed
Old Dominion University, preed@odu.edu

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**TO: Gene Martin, President
Technical Foundation of America**

**FROM: Philip A. Reed, Associate Professor
Department of Occupational & Technical Studies, Old Dominion University**

DATE: January 13, 2007

RE: Technology Education Research Conference

The following report addresses questions established by the Technical Foundation of America prior to attending the Technology Education Research Conference (TERC) December 7-9, 2006 in Surfer's Paradise, Australia. Responses appear below each of the four questions.

Your assessment of the viability of a foundation hosting a technology education research conference/symposium/seminar here in the US. Is there a sufficient amount of research (both quantity and quality) currently being conducted by members of the technology education profession to substantiate the need for a research conference/symposium/seminar in the US?

A conference/symposium/seminar on technology education research has the potential to significantly advance the profession. Currently, technological literacy is being promoted by many outside organizations (e.g. National Science Foundation, National Academy of Engineering, National Research Council) to help promote careers related to science, technology, engineering, and mathematics. However, these same organizations are calling for research that supports practice. And, there is clearly a well-documented need for research (see Cajias, 2000; Custer, 1997; Lewis, 1999; National Research Council, 2002; Petrina, 1998; Waetjen, 1992). To continue this external support, the profession needs to come together and demonstrate the efficacy of technology education. Coming together to gather research support for technology education is also important because the declining number of technology teacher education programs means fewer faculty members to conduct research (Rogers, 2002; Volk, 1997).

I do not believe there is currently a sufficient amount of research being conducted by the technology education profession. A conference/symposium/seminar could help identify what research exists as well as the most pressing areas of need. Additionally, since technology education researchers often conduct individual/disjointed research, such a meeting could help focus research efforts and create collaboration on large projects. In Australia, for example, there are so few researchers that they often tackle large research projects together. Projects are often headed by one researcher but data collection and analysis is usually split among several researchers (Ivan Chester, Griffith University, personal communication, December 8, 2006).

If the foundation was to host a research conference/symposium/seminar at some future date, please provide a response to the following questions: (a) What should be the primary themes of that conference/symposium/seminar? (b) What specific topics should be addressed by the participants? (c) What should be the methodology to select participants?

There are several ongoing activities that could help shape the theme for a technology education conference/symposium/seminar. First, the CTTE Research & Scholarship Committee is gathering articles to conduct a meta-analysis of needed research. This activity is designed to help build the foundation for a research agenda. Second, I am assembling a concept proposal for a CTTE yearbook on research that I plan to submit for the Yearbook Committee meeting at the upcoming ITEA conference (Appendix A). The yearbook would highlight best practices in technology education research, outline a research agenda, and help show what effect technology education has on students. Third, ITEA Task Force 2.4 is helping to identify a research database of effective practices in technology education (Appendix B). I am heading up this task force which hopes to list existing research online so teachers, administrators, and other constituents can show support for technology education practice.

Given these initiatives, I envision several possible themes for a technology education research conference/symposium/seminar. Such a gathering could identify methods to help alleviate apprehensions which people may have with regard to conducting research. Participants could detail best practices that may help other researchers conceive future studies. A second theme could be to provide support for traditional technology education practices. For example, participants could be assigned a topic (i.e. problem solving, creativity, contextual learning) and then they would need to present research findings in these areas. A significant amount of support for technology education could be gathered, especially if participants were required to review and synthesize research on their topic from within technology education *and* from general education.

Participants should include seasoned researchers and budding scholars. A review of published research could be used to identify the seasoned researchers. For example, most of the authors listed in Appendix A were selected because their names kept surfacing in a twelve-year review of prominent technology education journals (Reed, 2006). Young scholars should be identified by peers (e.g. previous TFA activity participants).

Based upon what you learned in Australia, is there significant and meaningful research being conducted by technology education professionals in other countries that for whatever reason is not being conducted here in the US? If your response is in the affirmative, what are your suggestions for communicating this need to the profession's current members and what methods do you suggest to encourage US technology educators to conduct this research?

I was actually amazed that most of the presentations at the TERC were theoretical and/or philosophical. This was especially surprising given the name of the conference. I did not see any significantly different research being conducted internationally that is not being done in the United States. For example, Kay Stables and Jenny Bain from Goldsmith's College in the United Kingdom presented several very good presentations on creativity but similar work has been conducted in the United States (Michael, 2001).

Several comments regarding research in the United States did strike me after my presentation. Kurt Seemann, Southern Cross University, Australia mentioned that he was not aware of most of

the research I discussed or the publications by organizations such as the National Research Council and the National Academy of Engineering. After discussion and reflection on this point, it became clear that researchers in the United States need to publish more in international journals. A second comment from Jenny Bain, Goldsmith's College provided an outside perspective on technology education research in the United States. She said "Boy, you all in the United States sure are organized and more on top of your research than everyone else." It was good to hear Jenny's viewpoint but the political pressures technology education in the United States currently faces cannot be denied.

Based upon what you learned in Australia, do other countries have a technology education research agenda? If your response is in the affirmative, describe how their agendas were developed. If your response is not in the affirmative, should this preclude the US from identifying a research agenda? Other words, should the technology education profession in the US have a research agenda, irrespective of what is occurring in other countries, and what is the methodology that should be followed to develop this agenda?

The following people were asked if they were aware of technology education research agenda's in their country or other countries:

- Jenny Bain, Goldsmith's College, United Kingdom
- Ivan Chester, Griffith University, Australia
- Steve Petrina, University of British Columbia, Canada
- Kurt Seemann, Southern Cross University, Australia
- Paul Snape, Christ Church College, New Zealand
- John Williams, Edith Cowan University, Australia

No one was aware of an existing research agenda. As I engaged each of these individuals however, they became very interested in the concept of a research agenda. Most of them asked enthusiastically if the United States was engaged in the development of an agenda. John Williams and Stephen Petrina understand the research climate in the United States very well and feel an agenda is long overdue. Further discussion with Stephen lead him to agree to potentially developing a research agenda in a CTTE yearbook (Appendix A).

I agree with the rudimentary results of this survey that a research agenda is needed in the United States. In the late 1990's the American Association for the Advancement of Science held two conferences to discuss the concept (AAAS, 1999). Likewise, the National Research Council (2002) published a research model in *Investigating the influence of standards: A framework for research in Mathematics, Science, and Technology education*. These activities are very important for the promotion of technology education research but they do not directly outline a comprehensive plan.

Technology education will only be accepted into general education if the current political interest continues, the profession has a clear line of inquiry, and research is conducted that supports classroom practice. All efforts that can promote one or more of these areas should be embraced by the profession.

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Appendix A: CTTE Research Yearbook Concept Proposal Outline

Section 1: Research at different levels to include review and synthesis at each level and best practices.

Elementary Research – Pat Foster (contacted)
Secondary Research – Kurt Michael (contacted)
Undergraduate Research – Scott Warner (contacted)
Graduate Research – possibly Phil Reed

Section 2: Research Agenda – Stephen Petrina & Ted Lewis (contacted). Similar to *Investigating the Influence of Standards: A Framework for research in Mathematics, Science, and Technology Education* (see <http://www.nap.edu/catalog/10023.html>), but broader than just standards-based research.

Section 3: Best practices that support research agenda.

Action Research – Phil Cardon, Kurt Helgeson, Chris Merrill & Kurt Michaels (follow up on their project highlighted in Dec-Jan TTT) (contacted)
Cognition – Karen Zuga (contacted)
Experimental Research – Jim Haynie (contacted)
Innovation in Technology Education – Jim LaPorte (contacted)
STEM– Mark Sanders (contacted).

Appendix B: ITEA Task Force 2.4

2.4 Identify a research database of effective practices in technology education and disseminate related information.

Target Date	Action
5/06	2.4.1 Convene a task force to determine what type of information might be available to identify what effective practices are for teaching TIDE. This determination would allow the researchers to know what channels of research to follow as they are searching.
10/06	2.4.2 Identify a team of researchers to collate and present information on their particular strand of effective teacher practices.
2/07	2.4.3 Prepare a report to be used as a guide for future researchers in the field desiring to address effective practices.
5/07	2.4.4 Prepare an article for the Journal of Technology Education to feature this work and its findings.