

## **Commentary: Expanding Notions of Acceptable Research Evidence in Educational Technology: A Response to Schrum et al.**

[Kara Dawson](#) and [Richard E. Ferdig](#)<sup>1</sup>  
*University of Florida*

### **Abstract**

"Developing Acceptable Evidence in Educational Technology Research" (Schrum et al., 2005) and its precursor editorial, "A Proactive Approach to a Research Agenda for Educational Technology" (Bull, Knezek, Roblyer, Schrum, & Thompson, 2005), are unprecedented collaborative efforts by journal editors to influence research in our field. This response aims to highlight the inherent complexity within each of the four main issues addressed by Schrum et. al. and to expand the conversation. We appreciate both the editors' efforts to be proactive with the problems and solutions as well as their open invitation to comment on their ideas for advancing the field. We look forward to continued dialogue.

"Developing Acceptable Evidence in Educational Technology Research" (Schrum et al., 2005) and its precursor editorial, "A Proactive Approach to a Research Agenda for Educational Technology" (Bull, Knezek, Roblyer, Schrum, & Thompson, 2005) are unprecedented collaborative efforts by journal editors to influence research in our field. Although other authors have also documented the lack of research evidence accompanying and even justifying the expansion of technology in our schools, these two publications represent a collective effort initiated by major journal editors—a group that can promote an immediate and longstanding impact on what research gets published.

Schrum et al. (2005) argued for four major areas that can be proactively addressed. Those areas or issues include (a) a platinum standard for acceptable research evidence, (b) connecting beliefs, practice and learning outcomes, (c) mentoring to facilitate effective research, and (d) improved communication and dissemination of research findings. They conclude with a request for open conversation about these issues and ways to promote implementation and change in our field.

Through this commentary, we share additional perspectives written through the lens of two faculty members who recently navigated the tenure and promotion process and are currently mentoring numerous doctoral students. The authors of both reports have successfully identified both the converging issues in our field and the problems and resulting changes that must occur because of these issues. Therefore, we focus our attention not on the identification of the issues or solely the potential solutions, but rather the complexity within each of the four main issues.

### **A Platinum Standard for Educational Research**

Schrum et al. (2005) reminded us that the U.S. Department of Education's gold standard for educational research involves randomized, experimental designs with treatment and control groups. However, they also note the complexity of doing that type of research in school settings while facing the publish or perish mentality of major research institutions. The resulting outcome, they suggest, is often "quick and easy" research in nonschool settings that does not fit into authentic teaching environments. They argue for a platinum standard with rigorous research within authentic school settings, calling this authentic research in authentic learning situations.

Major research institutions, and more recently even teaching colleges and universities, may never waiver from the publish and perish motif. This problem faces almost every academic field and discipline, ranging from how much presenting at major conferences in computer science counts to how historians of education can be held to the same publication quantity standard when one publication may take years to produce. Unfortunately for now, the best solution is to mentor doctoral students to thrive within the unwritten rules of the system while producing research publications that influence the field (more on that later).

There are four important considerations if the platinum standard for scientifically based research (SBR) is to be adopted. First, we question whether it is enough to say that "the platinum standard requires rigorous research in authentic school settings that approaches idealized designs as nearly as possible..." There must also be some external set of standards to guide such research. One example is the standards set forth by the What Works Clearinghouse (WWC). The WWC standards ([http://www.whatworks.ed.gov/reviewprocess/study\\_standards\\_final.pdf](http://www.whatworks.ed.gov/reviewprocess/study_standards_final.pdf)) have three measures for inclusion in the clearinghouse. They review the relevance of the topic, the evidence for causal validity, and a collection of other important measures of fidelity and outcome measures.

We are not suggesting that the WWC standards be chosen as the defining rubric for either measuring the platinum standard or for inclusion in journal publications. We are recommending, however, that if we as a field move forward with any sort of standard, it must be defined more clearly in order to promote generalization, not only within the specific contexts but also across contexts within our field.

The second resulting need of adopting a platinum standard is the call for codebooks or heuristics within specific research areas. Anyone who has completed a meta-analysis knows the complexity and frustration of viewing hundreds of different studies on the exact same topic that have differing outcome measures and definitions of concepts and yet a lack of descriptors to compare across studies.

Waxman, Linn, and Michko (2003) and Cavanaugh, Gillan, Kromrey, Hess, and Blomeyer (2004) both argued for heuristics and codebooks to strengthen research. More importantly, in their research projects on technology and student outcomes and research in virtual high schools (respectively), they both provided excellent examples of heuristics that future researchers could modify and adapt. Future publications in the same area would then be more easily understood in the context of the same conversation.

A third consideration of the platinum standard, one most recognizable to non-SBR publishers, is that there is no mention of qualitative research. We are cognizant of the fact that in addition to tenure, funding is a major issue for young researchers. Most funding agencies, particularly in the age of *No Child Left Behind*, are looking solely for research studies that promote SBR's version of randomized, experimental studies. However, we need to help young researchers understand that many research projects, even those strictly quantitative in nature, will allow a qualitative component (perhaps even as a cost-share) to support the overall research efforts. In particular, qualitative methods provide avenues for understanding a particular problem and set the stage for quantitative studies that allow for generalizability.

We acknowledge that there are numerous examples of nonrigorous, poorly designed qualitative research studies; the same, however, can be said for research with quantitative methods. If we adopt standards that push definitions of SBR, then we should also examine criteria for defining quality within qualitative publications. One example might be the work of Clifford Geertz and thick description (1973).

A final consideration of the platinum standard reflects the dichotomy between research in school settings and out-of-school settings. This problem could—and perhaps should in a later commentary—address issues of transfer, situated cognition, community of practice, and other questions about when and where learning occurs (Putnam & Borko, 2000). We agree with Schrum et al. that research that needs to be done in schools is not being done. We also concur on the constraints of schools and the resulting complexity for school-based researchers. And, although we strongly support an increase in school-based research (in fact, the first author considers this a primary focus of her research), we worry about tipping the balance too much in favor of school-based research. Not everyone in our field is cut out for school-based research; others may simply not be interested.

More importantly, we do not want the platinum standard to somehow suggest that learning in out-of-school settings has become de-valued (Resnick, 1987). What would perhaps be most helpful is not to assume that the platinum standard values one context over the other, but that the platinum standard demands research and resulting publications that thickly describe the context in which the study occurs and offer results with implications for practice regardless of this context.

This notion of learning in school vs. out-of-school settings is a complex and yet important notion, not simply because of context, but also because of the educational technology users of differing ages. If a platinum standard focuses solely on in-school settings, it implies that educational technology is focused only on school-age children. Either defined as K-12 or Pre-K to graduate school, the result is that we fail to include technologies to improve teaching and learning across the lifespan. Researchers working with early childhood literacy acquisition or online learning for seniors become marginalized.

This situation has become realized in academic departments where educational technology is located in educational psychology in one school, and educational leadership, teacher education, or in its own department in another. This leads to

complexity in defining our field. Perhaps only better definitions and a push for more stringent and rigorous standards within those definitions will lead to an inclusive and yet context-specific publication of data that strengthens our knowledge base.

We agree that a platinum standard must be adopted for publications in our field. However, we suggest that this standard be more specific and contain stronger definitions, heuristics, and rubrics. In addition, the standard must be inclusive of educational technology subfields and different methodologies within the study of how to improve learning.

### **Connecting Beliefs, Practice, and Learning Outcomes**

Schrum et al. (2005) correctly noted that much of the research in educational technology has not been connected to schools or related to specific learning outcomes. The authors suggested three areas for improvement. First, research studies should examine teachers' beliefs about technology in their practice. Second, moving beyond self-reporting, research studies should examine teachers in practice. Finally, there should be an improved and yet broader effort to attain student learning outcomes.

Strictly "scientifically based research" might get at some of the important issues behind teacher practice and student outcomes. However, a clarified platinum standard with an expanded methodology would greatly improve the ability of researchers to attain information about teacher beliefs and practice and the resulting outcome on learning. For instance, strong qualitative methods would help with direct observation of teacher practice.

There are four additional important distinctions we would like to make within this area. First, we want to reiterate the editors' assertion that there are too many article submissions and resulting publications focused on self-reported teacher beliefs or practices. Self-reporting is not in-and-of-itself a problematic methodology; however, untriangulated data or data that are not connected to learning outcomes do not necessarily provide the rigorous support of implications for policy and practice. We would hope that mentors of young researchers, as well as editors and editorial review boards, would help shape research publications that provide rigorous methods for studying beliefs and practice as well as direct connections to learning outcomes.

Second, Jones and Paolucci (1998) demonstrated that at the time, only 18% of all journal publications in major educational technology journals actually addressed learning outcomes. Research that fails to address learning outcomes fails to address the important issues of our field and provides ripe ground for critics (Oppenheimer, 2003). One way to examine learning outcomes in authentic contexts is through K-12/university partnerships designed to simultaneously facilitate technology integration in teacher preparation programs and K-12 schools (Clark, Foster & Mantle-Bromley, 2005; Goodlad, 1994). Another example is teacher inquiry, a viable tool to examine the learning outcomes of both K-12 students and prospective teachers within K-12/university partnerships (Dawson, in press); both should be further explored as a possible methodology within the platinum standard.

At present, there are many K-12/university partnerships in place to support technology integration across the country (Hartshorne, Ferdig, & Dawson, 2005) but few rigorous, longitudinal studies designed to examine learning outcomes within them. Likewise, connections between and among such partnerships are sparse. We envision a multi-university research initiative designed to carefully explore learning outcomes for K-12 students, prospective teachers, and practicing teachers within K-12/university partnerships that adheres to the platinum standard for research.

Third, one of the problems within educational technology is that we are a relatively young field and may not have the language to describe what we are observing. In other work, we have called for a deeper psychology of technology (Ferdig & Weiland, 2002). The idea behind a deeper psychology of technology is that we borrow ideas, terms, and concepts from psychology and other disciplines to help quantify and qualify the data we are collecting. In some sense this returns us to the discussion on a collective heuristic or codebook to share definitions and concepts of our observations. However, this is also related to our need to bridge relationships with those doing work in sociology, anthropology, neurology, cultural studies, computer science, and a host of other fields to help situate past work, contextualize current research, and guide future studies.

Most educational technologists will argue that the definition of technology is broader than simply those devices with a CPU. As such, technologies have been around forever. However, we fail ourselves when we fail to understand observations others have made about human behavior and tool use prior to or outside of the arena of devices that beep and whirr. Likewise, we wonder if we fail our doctoral students when they do not have many opportunities to take classes outside of our department or college.

Finally, the editors make a very important point about specific technologies. They argued, "Different technologies are designed to address different content areas, and even specific concepts within a given subject area." This is an important and timely observation; researchers have begun to address technological pedagogical content knowledge (TPCK; Ferdig, in press; Mishra & Koehler, in press; Thompson, 2005). Shulman (1987) noted that if pedagogical knowledge was the understanding of how to teach and content knowledge was an understanding of that subject matter then pedagogical content knowledge was an understanding of how to teach that content matter.

Although authors differ on their interpretations of TPCK, one understanding could be the knowledge of how to teach a particular content area with a particular technology. This has an impact not only on mentoring future researchers, but also on the implications and broad reaching implications of a study. In other words, we want research to be focused on outcomes, but research should not include a forced interpretation of how that study impacts learning in other domains or with other technologies.

We agree that research needs to be directly related to learning outcomes and that more research needs to highlight specific areas within teacher practices and beliefs. We believe that K-12/university partnerships represent one important way to highlight the connection between all three areas. We also believe that we need to continue to borrow from, interact with, and bridge partnerships with other disciplines that directly impact our work. Finally, learning outcomes are crucial, but authors have to be careful about drawing implications that are not substantiated because of the specific context or technology used in the study.

## Mentoring

Schrum et al. (2005) discussed some of the issues and challenges associated with mentoring doctoral students and claim that mentoring is one of the most important aspects of our jobs as faculty. We concur.

We were both fortunate enough to be mentored at well-respected institutions by well-known scholars in the field. We found the transition to academic life at a Research I university relatively painless in terms of understanding the rules and processes associated with publishing, seeking funding, and teaching graduate and undergraduate courses. However, we continue to find the transition from mentee to mentor somewhat frustrating and were pleased to see the editors explicitly addressing this issue to the field.

Students tend to enter our Ph.D program for a variety of reasons. Some come because they desire the academic lifestyle of a Research I university, others wish to earn the credentials to teach educational technology courses at a small college, university, or community college, others desire promotion within their current profession (i.e., instructional designer, software developer, director of online learning, principal, computer integration specialist, etc.), and others simply consider it a personal goal. We have repeatedly struggled to figure out how to meet the needs of all these students. We suspect many others relate to these challenges.

We believe the scholarship of engagement is a nice framework within which to consider the needs of a diverse doctoral population. The scholarship of engagement encourages faculty members to conduct academically relevant work that aligns with their institution's mission and serves important needs in the community. Ernest Boyer (1996) built from the Carnegie report entitled, *Scholarship Reconsidered: Priorities of the Professoriate* (Boyer, 1990), to assign four mutually inclusive roles of the professoriate: discovery, integration of knowledge, teaching, and service. This concept provides an excellent framework from which young scholars can craft their authentic, school-based and non-school-based research agendas, regardless of their professional goals.

Likewise, we believe doctoral students need to have an explicit understanding of the purposes of doctoral education, the nuances of the professoriate, and the broad opportunities and challenges of educational research. Some writings that may assist in these efforts include *Envisioning the Future of Doctoral Education: Preparing Stewards of the Discipline—Carnegie Essays on the Doctorate* (Golde & Walker, 2006), *Academic Duty* (Kennedy, 1997), *The Trouble With Ed Schools* (Labaree, 2004) and *Studying Teacher Education* (Cochran-Smith & Zeichner, 2005).

Finally, we believe the field would greatly benefit from a broader conversation about mentoring and the strategies used at different institutions to prepare young scholars. We have initiated this conversation through a subsequent article and hope others will enthusiastically share their strategies and provide feedback about ours. We look forward to the dialogue.

We agree that mentoring is one of our most important jobs as faculty. We believe doctoral students need to have an explicit understanding of the purposes of doctoral education, the nuances of the professoriate, and the broad opportunities and challenges of educational research. We also believe our field would greatly benefit from a broader conversation about mentoring and the strategies used at different institutions to prepare young scholars.

## **Communication and Dissemination**

The final area that Schrum et al. addressed is the idea of communicating and disseminating ideas. They correctly noted that research must be shared with policy makers, school board members, administrators, teachers, and parents (our addition), if we are to effectively influence practice. They suggest that a Web presence with a complementary practitioner article, summaries and lists of both research and practice-related articles, and invited opinions from practitioner-oriented editors might help in this manner.

We applaud these efforts as introductory steps toward bridging research and practice. There is a concern, however, that there is too much of a dichotomy being made between research and practice. For instance, we would like to suggest that editors do not accept articles for publication unless there is a strong section on implications for policy and practice. Most article review forms request the reviewer to rate the section on implications. However, perhaps this needs to be made one of the most important sections. In this way, the authors of the research begin to understand that they play an important role in influencing policy.

Bridging policy and practice is a complex issue because it also relates to tenure. Little recognition is given for publications in teacher- or practitioner-oriented journals at most research institutions. However, manuscripts submitted to top peer-reviewed journals are often more scrutinized for their literature review, methodology, and analysis than they are for the implications for policy and practice. Editors of lead journals refusing to publish manuscripts without strong implication sections would reinvigorate the interest in dissemination and communication. Another option along these same lines would be to separate implications into two separate categories on review forms. Often, if implications are included, authors are simply writing to other researchers or to theoreticians. One section reviewing implications for research and another on implications for policy and practice would make research much more accessible.

The problem is that students learn as young researchers that the type of journal (research vs. practitioner oriented) or strength of conference speaks volumes on your vitae. This is reinforced when they become faculty members, as administrators send out articles on how to calculate the "impact factor" of their research. Unfortunately, these calculations have more to do with the number of citations and cross-references by other researchers than they do on specific learning outcomes or any identification of teacher change. Many academics attempt to find resolution in this mixed-message by publishing as much as possible pretenure and then focusing on the impact once tenure or promotion is attained.

Our hope is not to ignore this concern; but our concern is that by making a larger and more prominent distinction between editors and authors of one type of article vs. editors and authors of the other type, we are missing the importance of how individual writers can speak both languages. In doing so, they are able to fulfill publication requirements while still influencing policy and practice.

We believe that editors can play an important role in helping bridge policy and practice by providing unique opportunities on their Web sites and in their journals. We also believe that they can influence their authors to speak both languages, and in doing so, not reinforce the separation between the two. We understand this is related to tenure and promotion, but we believe future scholars can be mentored to be inclusive about who sees the implications of their research.

## Conclusions

We agree with the authors that these are important issues, and we appreciate both their efforts to be proactive with the problems and solutions and their open invitation to comment on their ideas for advancing the field. What we have tried to do in this response is to highlight the complexity of the problems and, therefore, the difficulty in providing simple answers to them. As a concluding point, we would like to remind readers that editors have a special opportunity to address these issues through their volunteer work with their journal. However, it is the responsibility of all of us to be proactive with these concerns. This can happen when mentors, authors, teachers, researchers, students, administrators, and members of editorial review boards are proactive with the opportunities given them as a part of their professional duties. This can also happen as professionals engage in the conversation about the issues and potential solutions for our evolving field.

## End Notes

<sup>1</sup>Contributions to this article were equal. We rotate authorship in our writing

## References

- Boote, D.N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, 24(6), 3-15.
- Boyer, E. L. (1990). *Scholarship reconsidered: Priorities of the professoriate*. San Francisco: Jossey Bass.
- Boyer, E. (1996). The scholarship of engagement. *Journal of Public Outreach*, 1 (1), 11-20.
- Bull, G., Knezek, G., Roblyer, M. D., Schrum, L., & Thompson, A. (2005). A proactive approach to a research agenda for educational technology. *Journal of Research on Technology in Education*, 37(3), 217-220.
- Cavanaugh, C., Gillan, K.J., Kromrey, J., Hess, M., & Blomeyer, R. (2004). *The effects of distance education on K-12 student outcomes: A meta-analysis*. Retrieved February 28, 2006, from the North Central Regional Educational Laboratory Web site: <http://www.ncrel.org/tech/distance/k12distance.pdf>
- Cochran-Smith, M., & Zeichner, K. (Eds.) (2005). *Studying teacher education: The report of the AERA panel on research and teacher education*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Clark, R. W., Foster, A., & Mantle-Bromley, C. (2005). *Hybrid educators and the simultaneous renewal of schools and the education of educators*. Seattle, WA: Institution for Educational Inquiry.
- Dawson, K. (in press). Teacher inquiry: A vehicle to merge prospective teachers' experience and reflection during curriculum-based, technology-enhanced field experiences. *Journal of Research on Technology in Education*

Dawson, K., & Ferdig, R.E. (2005). Experiences in promoting an intercultural perspective in an educational technology program. *Interactive Educational Multimedia, 10*, 23-37.

Ferdig, R.E. (in press). Assessing technologies for teaching and learning: Understanding the importance of technological-pedagogical content knowledge. *British Journal of Educational Technology*.

Ferdig, R.E., & Weiland, S. (2002). A deeper psychology of technology: A case study of a girl and her eMate. *Journal of Technology and Teacher Education, 10(3)*, 423-430.

Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.

Golde, C., & Walker, G. (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline - Carnegie essays on the doctorate*. San Francisco, CA: Jossey-Bass.

Goodlad, J. (1994). *Educational renewal*. San Francisco: Jossey-Bass Publishers.

Hartshorne, C.R., Ferdig, R.E., & Dawson, K. (2005). Preparing current and future teachers to teach with technology: An examination of school-university collaborations. *Journal of Computing in Teacher Education, 21(3)*, 109-117.

Jones, T.H., & Paolucci, R. (1998). The learning effectiveness of educational technology: A call for further research. *Educational Technology Review, 9(2/3)*, 10-14.

Kennedy, D. (1997). *Academic duty*. Cambridge, MA: Harvard University Press.

Labaree, D.F. (2004). *The trouble with ed schools*. New Haven: Yale University Press.

Mishra, P., & Koehler, M. J. (in press). Technological pedagogical content knowledge: A new framework for teacher knowledge. *Teachers College Record*.

Oppenheimer (2003). *The flickering mind: The false promise of technology in the classroom and how learning can be saved*. New York: Random House.

Putnam, R.T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher, 29(1)*, 4-15

Resnick, L. B. (1987). Learning in school and out. *Educational Researcher, 16(9)*, 13-20.

Schrum, L., Thompson, A., Sprague, D., Maddux, C., McAnear, A., Bell, L., & Bull, G. (2005). Advancing the field: Considering acceptable evidence in educational technology research. *Contemporary Issues in Technology and Teacher Education* [Online serial], 5(3/4). Retrieved February 28, 2006, from <http://www.citejournal.org/vol5/iss3/editorial/article1.cfm>

Shulman, L. (1987). *Knowledge and teaching: Foundations of the new reform*. Harvard Educational Review, 57(1), 1-22.

Thompson, A. (2005). Technological pedagogical content knowledge: Framing teacher knowledge about technology. *Journal of Computing in Teacher Education, 22(2)*, 46, 48.

Waxman, H.C., Lin, M.F., & Michko, G.M. (2003). A meta-analysis of the effectiveness of teaching and learning with technology on student outcomes. Retrieved February 28, 2006, from the North Central Regional Educational Laboratory Web site:  
<http://www.ncrel.org/tech/effects2/waxman.pdf>

**Author Note:**

Kara Dawson  
University of Florida  
[dawson@coe.ufl.edu](mailto:dawson@coe.ufl.edu)

Richard E. Ferdig  
University of Florida  
[rferdig@coe.ufl.edu](mailto:rferdig@coe.ufl.edu)

*Contemporary Issues in Technology and Teacher Education* is an online journal. All text, tables, and figures in the print version of this article are exact representations of the original. However, the original article may also include video and audio files, which can be accessed on the World Wide Web at <http://www.citejournal.org>