Publishing data evidence to support educational technology claims

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An ongoing debate in the field of educational research compares the value, usefulness, and rigor of qualitative vs. quantitative research methods. For instance, the US Department of Education has argued for a 'gold standard' with randomized, controlled trials. They require such designs as entry qualification for their "What Works Clearinghouse" (http://www.whatworks.ed.gov). Qualitative researchers argue that such "traditional research practices have been less of a stunning success than we hoped for and some of the disappointment has motivated some scholars to seek other models of inquiry" (Eisner, 2001, p. 138).

Somewhere in the radical middle are the notions of mixed methods or the concern of selecting the correct method for a specific question, particularly when it relates to schooling. Eisner (1993) argues that if:

> …there are different ways to understand the world, and if there are different forms that make such understanding possible, then it would seem to follow that any comprehensive effort to understand the processes and outcomes of schooling would profit from a pluralistic rather than a monolithic approach to research (p.8).

Still others have argued that combining the two methods is illogical on the grounds of epistemological or ontological inconsistency. Their objection is that the two methods are based on competing world views and should not be mixed (Stange, Crabtree, and Miller, 2006). This view is countered by a growing body of researchers who suggest that qualitative and quantitative methods both have strengths and weaknesses and combining the two can make use of the strengths and overcome the weaknesses of both approaches (Borkan, 2004). Further, they argue, mixed methods may make it possible for researchers to choose their methodologies as findings are revealed, and thus prevent forcing their research into either a qualitative or quantitative design according to past preference (Miller and Crabtree, 2005).

There is a great body of literature supporting both methods; there are also books and articles that provide thorough explanations of the debate and the future of educational and educational technology research (e.g. Smith, 1983; Haertel & Means, 2003; Schrum et al., 2005; Eisner, 1993; Maddux, 1995a, 1995b, 1996a, 1996b; Baker & O'Neil, 2003). "As for methodological debate, although there is an increasing number of texts and guides for those who might wish to mix or integrate methods, there is still fairly limited engagement with the methodological or theoretical underpinnings and implications of integrative research strategies" (Mason, 2006, p. 10). The purpose of this essay is not to add further discussion to this debate, nor is it to address the value of qualitative, quantitative, or mixed methodologies. Rather, it is to address how this debate translates into publishing in peer-reviewed journals. It is to examine how authors attempt to share data evidence from a chosen methodology in an attempt to publish the results.

It is possible that some journals, either explicitly or implicitly, have adopted a particular method. *Qualitative Inquiry*, *Qualitative Research*, *Statistics and Computing*, and the *Statistics Education Research Journal* should present readers with a clear sense of the adopted method simply from the title. However, what about the *Journal of Educational Multimedia & Hypermedia* or *Contemporary Issues in Technology and Teacher Education*? More relevant to this discussion, what about the *Journal of Technology and Teacher Education*? Has it adopted a 'gold standard' for publication methods?

The motivation behind this editorial is two-fold. First, although there is no data to support the claim (no pun intended), *JTATE* anecdotally rejects a higher percentage of qualitative articles than quantitative articles. Second, *JTATE* is the official journal of the *Society for Information Technology and Teacher Education* (SITE; http://www.aace.org/site/). Each year, at the annual conference, the editors of *JTATE* hold a working session with past, current, and future authors. In the working session or via emails to the editors, authors often suggest that because of the first point, *JTATE* 'must cater to quantitative manuscripts only.' Their argument is that their manuscript was rejected and it was qualitative; their peers, conversely, get accepted with quantitative results.

Nothing could be further from the truth. The *JTATE* editors, the advisory board, and the mission of the journal all subscribe to the notion that some questions are best addressed through quantitative designs while others are best suited to qualitative inquiry. As Eisner (2001) suggests, how fast an athlete ran a race is different than asking what they were thinking when they were running. The editors (as well as editors from other related journals) have accepted a 'platinum standard', but that standard does not refer to the method employed during the research design and implementation. Schrum et al. (2005) shares:

> Real schools and classrooms are messy and complex, and myriad factors contribute to each experience of a particular classroom, including individual attributes of the educator and learners and the subculture of any particular school. Experimental designs are often isolated from classroom realities, and results do not fit neatly into authentic teaching situations.
>
> Consequently, we endorse a 'platinum standard' for school research. The platinum standard requires rigorous research in authentic school settings that approaches idealized designs as nearly as possible given the constraints of schools and real-world learning environments. This term is suggested to

> illustrate that journal editors seek authentic research in authentic learning situations and recognize that research in these settings involves a number of complex design decisions and compromises (p.204).

Cook, Means, Haertel & Michalchik (2003) add:

> In some quarters, the randomized experiment is considered the causal gold standard. It is clearly that in theory, but not in school practice. There are just too many difficulties with implementing and maintaining randomly created groups, with the incomplete implementation of treatment details, with control group units borrowing treatment particulars, and with the limitations to external validity that often follow from how random assignment is achieved (p. 35).

The *Journal of Technology and Teacher Education* publishes three types of articles. *JTATE* publishes theoretical arguments and literature reviews *provided* those manuscripts do not simply summarize but rather present new models or ways of examining issues in the field. A second type of publication, and a new addition to the journal, is reviews of books relevant to the field. (One such book review is unveiled in this issue.) Finally, the most common publications are research studies that present data outcomes, results, and implications for teacher education and technology. <u>These research publications can adopt any method.</u> If that is true, however, then why do more qualitative pieces get rejected? There are at least two main reasons that could explain this imbalance.

First, researchers who present quantitative outcomes generally understand the method and the reporting techniques associated with that method. For instance, you would expect that the author would report on the method, the instrument, and the outcomes. They would include results in data tables and then they would present a discussion of that work. Editors and reviewers then evaluate the literature review, the theoretical perspective, the decision to use a particular instrument, the analyses, the method chosen, and the implications. The main point is that quantitative authors generally show the data, and the review is based on the background, the process of the study, and implications. If the manuscript is rejected, it is generally due to a weakness in one of these areas.

Conversely, <u>the number one reason qualitative articles get rejected by *JTATE* is because authors fail to include data</u>. Editors and reviewers are generally quite convinced by strong theoretical arguments backing the study, appropriate methods and instruments to get at data, and then discussions that relate the findings back to the theory. However, they are perplexed when the article contains almost no data.

More often than not, such an article will look something like this. Joe and Jill Author write that researchers have not examined teachers using technology. They present strong supporting evidence for the need to interview 15 teachers over a period of a year using an adapted interview protocol. Then, when they get to their data section of the paper, Joe and Jill report on five main findings. They discuss each of the findings in detail, describing and *discussing* what the finding means (often doing more discussing than reporting). In order to provide evidence for the claims, they take one exemplary quote to show the reader that the finding is valid. A reader, therefore, has to assume that the authors did the analyses correctly and that the data they are reporting on is representative of the entire data set. The entire year of

data collection is whittled down into one representative quotation for each of five results.

There is not enough space in this short essay, nor is it the purpose of the writing, to document all of the ways in which qualitative data can and should be properly reported. There are a number of publications that serve as guidance for such writing (e.g. Wolcott, 2001; Denzin & Lincoln, 2005; Elliott, Fischer & Rennie, 1999). Additionally, writing up qualitative data is obviously critically related to the method of analyses chosen. A write-up of discourse analyses will look different than narrative structure analyses. The point is that authors need to find ways to present the data rather than simply summarizing and hoping that readers will simply presume the data and analyses was presented properly and accurately.

A second reason that manuscripts reporting qualitative findings are either rejected or sent back for revisions relates to generalizability. Some researchers may argue that the qualitative method sits within a paradigm where findings can only be discussed within the context of the specific study. Generalizing to a broader context is not the purpose or the function of said research. Although *JTATE* values situated research and accepts that it may imply limitations in transfer and generalizability, editors and reviewers also underscore the importance of the discussion being situated within a larger framework.

Firestone (1993) suggests that there are a number of ways in which qualitative researchers can generalize analytically. Two of these include "predictable threats to generalizability can be organized under the broad headings of selection, setting, history, and construct effects" and selecting "single cases to maximize their use for generalizing about theories" (p.19). Firestone (1993) adds:

> The argument for qualitative research has never been that its claims for generalizability are exceptionally strong. Qualitative research is best for understanding the processes that go on in a situation and the beliefs and perceptions of those in it. Still, qualitative researchers can do things to increase the broad applicability of their findings. Some of these--like providing rich, 'thick' description--contribute to case-to-case reasoning. Others--like intentionally sampling for theoretically relevant diversity and replicating cases through multisite designs--are particularly useful in a more analytic approach. In any event, qualitative methods should not be avoided because of the fear that their claims for broad relevance are especially weak. (p.22).

His use of the word 'thick' refers back to the work of Clifford Geertz (1973). To do good ethnography, Geertz argued for the importance of "thick description" (p.6).

> What the ethnographer is in fact faced with—except when (as, of course, he must do) he is pursuing the more automatized routines of data collection—is a multiplicity of complex conceptual structures, many of them superimposed upon or knotted into one another, which are once strange, irregular, and inexplicit, and which he must contrive somehow first to grasp and then to render. And this is true at the most down-to-earth, jungle field work levels of his activity; interviewing informants, observing rituals, eliciting kin terms, tracing property lines, taking a census of households…writing his journal. Doing ethnography is like trying to read (in the sense of "construct a reading of") a manuscript—foreign, faded, full of ellipses, incoherent, suspicious emendations, and tendentious commentaries, but written not in

> conventionalized graphs of sound but in transient examples of shaped behavior. (p. 10)

There are different ways to present and report qualitative data. However, Geertz argues that thickly describing that data—and the context of that data collection—provides a way to get at some of the validity and generalizability that Firestone is referring to. Lincoln and Guba (1985) add that instead of internal validity, external validity, reliability, and objectivity, qualitative researchers ought to be examining credibility, transferability, dependability, and confirmability (respectively).

For a more thorough discussion on these issues, Hoepfl (1997) has developed a primer for educational technologists in addition to the aforementioned references. The point is that readers should leave this essay understanding that a method chosen for a study has nothing to do with the acceptance or rejection rate of publication in *JTATE*. The peer-review process is focused on argumentation and data to support that line of reasoning. Editors and reviewers expect a clear theoretical perspective that leads into a strong question; that question must be related to technology and teacher education (for consideration in *JTATE*). They are looking for the correct method (including instrumentation and techniques) to answer that question. They want to see the data and the analyses, and then they expect the conclusion to relate the findings back to the broader literature and theoretical perspective. Finally, the literature review itself should permeate throughout the manuscript, as an introduction to the problem, the justification for the method and analyses, and as triangulation of the data and related findings. *Manuscripts must convince readers through strong argumentation, data presentation and analyses, regardless of whether they are qualitative or quantitative in nature*.

This issue of *JTATE* contains five research articles, three of them are qualitative and two are mixed-method. The editors hope that these examples will help to clarify the expectation for publishing qualitative research in *JTATE*.

“Educational Designing with MicroWorlds” by Brouwer, Muller, and Rietdijk (2007) used a mixed-method design, relying on descriptive and correlative statistics as well as content analysis. A research model is provided and discussed. It shows how the various forms of data collection and analyses relate to each of the research questions. The implications discussed are well supported by the data presented.

Merkley, Duffelmeyer, Beed, Jensen, Bobys (2007), in “Using the R2D2 Model for Creating Collaboration Among Practicing Teachers and Preservice Teachers During Reading Assessment Preparation at Four Universities” used a qualitative approach, through the analysis of online postings, to examine the effectiveness of the R2D2 model. This article has a clear structure and strong links to the supporting literature. There are multiple examples provided to support each finding with well presented reflections on the process.

In “Addressing the NETS*S in K-12 Classrooms: Implications for Teacher Education” Niederhauser, Lindstrom, and Strobel (2007) demonstrate the power of narrative as a research tool. Using the National Education Technology Standards for Students (NETS*S) as their framework, Niederhauser, et. al. provide a thoughtful analysis of how teachers are using technology. The coding process is clearly explained with an example provided to demonstrate how the coding process was implemented. Results are provided with examples and are connected directly back to the literature.

Lord and Lomicka (2007) use a mixed method design in their article “Foreign Language Teacher Preparation and Asynchronous CMC: Promoting Reflective Teaching.” Their analysis is based on a strong theoretical framework and the data is presented in a clear manner.

In “An Online Interdisciplinary Discussion: Promoting Collaboration Between Early Childhood and Special Education Preservice Teachers,” Geer and Hamill (2007) examined the use of electronic journaling to assess collaboration between special education and general education preservice teachers. The journal prompts are included which aides in replication of the study. The analysis is clearly defined and resulted in six major themes and fifteen subthemes. The data is used to show the number of responses in each theme and subtheme. These are then discussed in relation to the data.

Conclusion

As is evident by this issue, JTATE publishes works that include rich data evidence, regardless of the method used in the research design. Detailed and careful research analyses, as well as purposeful design and construction of the write-up are critical to building a strong foundation of educational technology literature. Researchers in educational technology writ large, and technology and teacher education more specifically, who decide to follow a platinum standard for research publication, are strengthening and broadening the credibility of a relatively young field. The *JTATE* editors promote this line of thinking, encouraging editorial board members, reviewers, and authors to assist with this important goal.

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