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Technology and Teacher Education: Are We Talking to Ourselves?

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Colleges and schools of education today are facing a challenge caused by the differing philosophies and views of their teacher education faculty and the educational technology faculty. Some believe that technology should play a role in education and should be integrated within teacher education courses. Others feel technology should be left to an expert who teaches one course on technology skills. Still others believe that there are more important skills preservice teachers need, such as literacy or child development, and that technology is receiving too much attention.

Some teacher educators do not understand the type of teaching and learning technology supports. They have developed a culture that does not include technology and are uncomfortable when that culture is challenged. On the other hand, some educational technology faculty members are familiar with, at best, one pedagogical content area and are unaware of some of the issues teacher education needs to address.

Such a situation has led some in the educational technology field to ask the questions, "Are we working together or are we talking to ourselves? Are we talking with other teacher educators or are we talking only to each other?" These questions are important to consider as teacher educators and professors of educational technology attempt to work together to integrate more uses of computers and telecommunications in preservice education and professional development. Reflecting on the current situation in the educational technology field, there are *contradictory, but correct* answers to these questions: Yes, we are talking to ourselves — and, no, we are not talking to ourselves.

Yes, We Are Talking to Ourselves

The educational technology field does appear to be talking to itself. We are talking too much to each other and not enough to teacher educators.

As the educational technology field moves away from the stand-alone technology course and moves toward integrating technology across all teacher preparation courses, some important issues need to be considered. First, do teacher educators typically have the necessary skills and knowledge to integrate technology into courses? In most cases the answer is no. Technology was not a part of the majority of faculty members' teacher education preparation (Norton & Sprague, 2002-2003). Therefore, what technology skills they have developed were self-taught, learned at professional development workshops, or learned from a technology proficient mentor.

Such activities often focus on skill development (how to use the technology) not integration (how to teach with the technology). As a result, technology is usually limited to PowerPoint presentations or online communication through e-mail or discussion boards. The Preparing Tomorrow's Teachers to Use Technology (PT3) grant program was created to address this issue by helping faculty members develop skills in integrating technology into their teaching.

Second, do teacher education faculty members typically know enough about technology integration to model its use in K-12 classrooms? Again, the answer is no—not even those who have recently graduated from a doctoral program. They may have strong technology skills, but their understanding of how to integrate technology effectively in the K-12 classroom is limited. Unfortunately, few, if any, doctoral programs model technology integration throughout their courses. Therefore, many professors are unfamiliar with educational software and websites. The exception to this generalization may be methods specialists (social studies, science, math, and language arts), who have some familiarity with software designed for their content area.

Of course, related to this issue is the fact that few educational technology specialists know all the pedagogical issues of every content area and, therefore, some tend to focus more on the technology than on the content to be addressed.

Third, do teacher educators typically know enough about computers and telecommunications to ensure that a wide variety of technology tools will be integrated in the preparation program? Again, the answer has to be no. Although faculty members often integrate course management tools (such as Blackboard and WebCT), presentation software (such as PowerPoint), concept mapping software (such as Inspiration or Kidspiration), and content specific software, many other programs are not integrated. Research has shown that few teachers are prepared to use databases, spreadsheets, WebQuests, handhelds, or MUVEs (multi-user virtual environments) in the classroom, as these tools are seldom integrated in teacher preparation programs (Milken Exchange, 1999).

Researchers within the educational technology community explore appropriate ways to use these various tools, focusing on the types of learning provided by each. For example, databases are useful for organizing and analyzing information, simulations are useful for experimenting and structuring, and spreadsheets are used for computing and modeling (Norton & Sprague, 2001).

Educational technology faculty attend technology conferences and read technology journals to learn about the latest technology and to see how these technologies can be integrated in teacher education courses and in K-12 classrooms. Although some are effective at integrating technology to support learning of content areas, others focus on the technology itself with little understanding of the type of learning it supports and the pedagogical issues associated with that learning.

The purpose in raising these issues is not to criticize teacher educators or educational technology faculty. Teacher educators and educational technology professors are making an effort to integrate technology and should be commended. The purpose is to begin a discussion of the issues related to technology integration that goes both ways. What can the educational technology field do to help teacher educators develop an understanding of how to integrate technology? How we can work across disciplines rather than preaching to the choir?

Sharing Research Through Journals

One of the biggest issues with helping teacher educators model technology integration is not the lack of training, but the lack of knowledge. As discussed earlier, training focuses on technology skills, while knowledge is the sharing of ideas supported by research in the educational technology field. Too often, research conducted by the educational technology field does not reach our teacher education colleagues.

Within the educational technology field many publish their research in educational technology journals, such as the *Journal of Technology and Teacher Education, Journal of Computing in Teacher Education, Journal of Research on Technology Education,* or *Technology, Pedagogy and Education.* We share practitioner-based ideas in *Learning & Leading with Technology, Computers in the Schools,* or any of the other 30-40 journals available in the field.

The problem with this, of course, is that many of our teacher education colleagues do not read these journals. Therefore, they are not familiar with the research on best practices for integrating technology in teaching and learning. As a result, they integrate technology with no understanding of what is effective and what is not.

On the other hand, educational technology faculty members often do not read journals about different pedagogical strategies appropriate for the content areas

(i.e., *Language Arts, Theory and Research in Social Education, Journal for Research in Mathematics Education, Journal of Research in Science Teaching).* Sometimes, they enthusiastically embrace new technologies without an understanding of the suitability for teaching specific content or grade levels. Such enthusiasm can lead to the creation of technology fads.

In an effort to reach out to other teacher educators through their professional organizations, *Contemporary Issues in Technology and Teacher Education* (CITE Journal) was created. "The *CITE Journal* is an online, peer-reviewed journal, established and jointly sponsored by five professional associations (AMTE, AETS, NCSS-CUFA, CEE, and SITE). This is the only joint venture of this kind in the field of teacher education. Each professional association has sole responsibility for editorial review of articles in its discipline" (see CITE Journal home page). It is not clear at this time what effect this journal is having on the teacher education field, but it is an effort to stop us as technology educators from only talking to ourselves.

In order to share educational technology research with teacher educators, the field must be willing to publish in the professional journals read by most teacher educators. This consists of journals such as *Educational Leadership* and the *Journal of Teacher Education.* The problem here is that many of these journals treat technology as a separate subject, devoting one entire issue per year to technology-related articles. Teacher educators then view technology as separate from their normal routine, and the view that technology is not an integral part of teaching is perpetuated.

Sharing Research at Professional Conferences

Another important strategy is sharing educational technology research with professional organizations through conferences and task forces. The Society for Information Technology and Teacher Education (SITE), Ed-Media, and National Educational Computing Conference (NECC) are some of the conferences that draw the educational technology field together. However, like the journals sponsored by these same organizations, few teacher educators attend who are not members of the educational technology field.

SITE has made a concerted effort to attract more teacher educators to its annual conference by forming a partnership with the professional organizations representing each of the content areas. Through this partnership, experts in various content areas who are effectively integrating technology in their courses are invited to present at SITE. The invitations (and an award) are presented to them at their own professional organization's annual conference, in front of their peers. It is hoped that this recognition will encourage their peers to integrate technology and to attend SITE to see what is happening in the field.

Although such efforts have increased SITE's attendance and has attracted teacher educators from content areas, the impact has been small in comparison to the

number of teacher educators in the field. One problem that arises is that if teacher educators attend SITE they are unable to attend the conferences of their own professional organizations. In this time of tight university budgets, few faculty members have the resources to attend more than one or two conferences per year without having to use their own funds to cover travel expenses.

In response to this problem, an effort is being made to reach out to teacher educators through the Association of Teacher Educators (ATE) Technology Task Force. This task force consists of experts in the field of educational technology who are working to help ATE integrate more technology into its annual conference by conducting a variety of technology workshops (i.e., creating WebQuests, using iMovie, addressing National Technology Standards) and attracting keynote speakers (i.e., Dr. Chris Dede from Harvard University and Dr. Tom Carroll from the National Commission on Teaching and America's Future). Such efforts are raising teacher educators' knowledge and awareness of technology integration. Again, however, there are financial concerns —task force members are expected to cover their own travel expenses.

One way to address the financial issue is for organizations like SITE to collaborate with other professional organizations and schedule their conferences at the same time so that members can intermingle and share ideas. The Association for the Advancement of Computing in Education (AACE) has done this in the past, offering SITE and the Mathematics and Technology Education Conference jointly, allowing members to register for both conferences and attend sessions from each. Such a model would reduce travel expenses, but increases the number of sessions among which attendees must choose.

The conference may then become like the annual conference for the American Educational Research Association (AERA). Attendees there must choose from several interesting presentations, and presenters are given only ten minutes each to summarize their research. Such a model would not be effective for enabling teacher educators to integrate technology in their courses.

Although several models have been suggested and some have been discarded, it is important for the educational technology field to share our research with other teacher educators. In addition, it is important for those of us in the educational technology field to broaden our understanding of pedagogical issues and to read education research beyond the technology field. This will help us expand our understanding of these issues and to provide us with the language to discuss technology integration with our teacher education colleagues. If we do not find ways to do this, we will continue to talk to ourselves, sharing our research only with each other and seldom with our colleagues who would benefit from the information.

SITE, through the National Technology Leadership Initiative, has for the past two years brought together the editors from leading educational technology journals.

During the meetings the editors have explored a given topic and looked for ways to address this topic in their respective journals.

Perhaps it is time to reach beyond the educational technology journals and begin a dialog with editors of other teacher education journals to see how we can collaborate around topics in which technology can be integrated. During the annual AERA conference, journal editors from all fields of education meet to discuss issues related to editing journals. Perhaps this meeting could be a place to begin the dialog.

Political Process

In addition to teacher education colleagues, we need to share our research with policy makers. Education is currently under attack by policy makers and the popular press. The *No Child Left Behind Act* (Bush, 2002) was created to address education's "deficiencies," perceived to be caused by poorly trained teachers and irrelevant teaching methods. This is the message policy makers and parents hear and the message we must work together to counteract. We must not only show that education is capable of meeting the needs of students, but we also must show, using scientifically based research, how educational technology can be used to ensure that all children learn. Again, some of the necessary research is completed, but policy makers do not read educational technology journals.

Sharing our research only among ourselves will not influence policy makers' view of educational technology. We must be actively involved in the political process. At this time, the U. S. Department of Education is creating a National Education Technology Plan, which will be used to set the technology agenda for the Department of Education and the federal government in years to come. It is important that the entire educational technology field takes part in this process, for we will all be required to live with the outcome.

It is also important for those who have received a PT3 grant to share evaluation results with policy makers in their area. These evaluations must go beyond anecdotal records and case studies, as these are not viewed as "scientifically based research" by policy makers.

This is not to say that we cannot learn from case studies or that they have no value, but policy makers want quantitative data they can easily interpret. If we want to stop talking to ourselves, we need to conduct evaluations that go beyond attitude surveys and case studies and share these results with policy makers. Only then will policy makers understand why technology should play a major role in education.

No, We Are Not Talking to Ourselves

The previous section of this article focused on communicating outside the field of educational technology. However, the educational technology field itself consists

of three different subfields: teacher educators, researchers, and instructional designers. Faculty members from each of these areas of emphasis publish in their own journals and present at their own conferences. They do not share a common language or understanding of educational technology.

Teacher educators tend to focus their research on integrating a variety of technology in teacher education and/or K-12 education. They are interested in what works to improve teaching and learning. Although they may be involved with the design and creation of new technology, it is usually in the context of teaching and learning. They present their research at SITE and NECC and publish in many of the journals mentioned above.

Researchers are involved with the creation of new technologies built on knowledge of what has worked before. Their work is often funded through outside grants. They tend to focus on a specific technology, researching and studying its impact for years at a time, often in controlled environments or with an identified classroom or school district. Although these studies are useful, they have problems with scaling up to other education environments. Researchers often share their results at AERA, International Conference of the Learning Sciences, or Computer Supported Collaborative Learning conferences.

Instructional designers focus on the design and development of instructional materials using the latest information technologies. Their work involves technology in K-12 and teacher education, but also expands to include corporate and military arenas. Instructional designers present their research at Ed-Media and the Association for Educational Communications and Technology conferences. They value publication in journals such as *Educational Technology Research and Development* and *Educational Technology* (Holcomb, Bray, & Dorr, 2003).

The educational technology field needs all three perspectives in order to design and implement technology effectively. Each perspective is most effective when its practitioners incorporate some of the skills from the other perspectives. Instructional designers and researchers can learn from teacher educators about what types of technology work in the K-12 classroom and how to address integration issues. Addressing these issues from the start could help with scaling up issues. Teacher educators can learn from researchers and instructional designers about how to use a variety of new technologies (best practices for incorporating the technology).

The problem arises when these three groups are separated and have little interaction with each other. Only a few individuals interact with all three camps. Without a willingness to work together and share results, the educational technology field ends up duplicating efforts, and we miss opportunities to learn from each other. Without a common language built upon common experiences and research goals, we cannot say we are talking to ourselves.

There have been efforts to connect the teacher educational technology community with the research technology community. A few years ago, the Center for Innovative Learning Technologies (CILT) funded a seed grant that allowed SITE to create a database of members (ASTUTE). The second step of this project was to connect SITE members with CILT members (primarily researchers) to begin collaborating on projects. Although this second step was not completed, there does appear to be an interest in working together, and this project should be explored again.

In addition, instructional designers should be added to the database. The database will allow those in the educational technology field to search and locate other educational technologists who share common interests and expertise. Therefore, teams can be developed to work on projects together.

Another possibility would be for an organization to sponsor an educational technology conference that invites representatives from all three perspectives. Unlike other conferences, no one perspective will dominate. Instead, the idea would be to network and collaborate across the subfields. This will allow us to learn from one another and begin to understand one another's cultures.

Conclusion

This article calls for the educational technology field to extend beyond its current focus and develop a stronger understanding of pedagogical issues. The educational technology field needs to reach out, not only to those with other perspectives within the field, but also to teacher educators. By collaborating with each other and our teacher education colleagues, we can expand the influence of educational technology and heal any potential rifts before they occur. It is time for us to stop talking to ourselves and to start talking to ourselves.

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Resources

American Educational Research Association (AERA) - http://www.aera.net/

Association for Educational Communications and Technology (AECT) - https://www.aect.org/

Association of Teacher Educators - http://www.ate1.org>

ASTUTE-A Survey of Technology Using Teacher Educators - http://info.ctlt.iastate.edu/ASTUTEWeb/ASTUTE/default.htm

Center for Innovative Learning Technologies (CILT) - http://www.cilt.org/

Computers in the Schools - http://www.epi-center.net/journals/journals/computers_inthe_schools.html

Computer Supported Collaborative Learning (CSCL) - http://www.isls.org/cscl/

Dr. Chris Dede's Website - http://www.gse.harvard.edu/~dedech/

ED-MEDIA - http://www.aace.org/conf/edmedia/default.htm

Educational Leadership - http://www.ascd.org/

Educational Technology Research and Development (ETR&D) - https://www.aect.org/Intranet/Publications/etrd/5101.asp

International Conference of the Learning Sciences (ICLS) - http://www.gseis.ucla.edu/~icls/

Journal of Computing in Teacher Education - http://www.iste.org/jcte/20/1/index.cfm

Journal for Research in Mathematics Education - http://my.nctm.org/eresources/journal_home.asp?journal_id=1

Journal of Research in Science Teaching - http://www.josseybass.com/WileyCDA/WileyTitle/productCd-TEA.html

Journal of Research on Technology Education - http://www.iste.org/jrte/36/1/index.cfm

Journal of Teacher Education - http://www.aacte.org/Publications/journal_teacher.htm

Journal of Technology and Teacher Education - http://www.aace.org/pubs/jtate/default.htm

Language Arts - http://www.ncte.org/pubs/journals/la

Learning & Leading with Technology - http://www.iste.org/LL/31/3/index.cfm

National Commission On Teaching and America's Future (NCTAF) - http://www.nctaf.org/

National Educational Computing Conference (NECC) - http://center.uoregon.edu/ISTE/NECC2004/

Preparing Tomorrow's Teachers to Use Technology (PT3) - http://www.pt3.org

Society for Information Technology and Teacher Education (SITE) - http://www.aace.org/conf/site/default.htm

Technology, Pedagogy and Education - http://www.triangle.co.uk/jit/

Theory and Research in Social Education - http://www.ncss.org/cufa/trseguidelines.shtml

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