TPACK Newsletter, Issue #8: February 2011

Welcome to a new year and to the eighth edition of the TPACK Newsletter! Please forgive our long delay in getting this "mega-issue" to you. We'll do a lot of "catching up" with what has been happening with TPACK worldwide in this issue, so please sit back and prepare to be impressed with how quickly and far use of this construct has spread!

If you are not sure what TPACK is, please surf over to http://www.tpack.org/ to find out more.

Gratuitous Quote About Technology

"Social networking on the Internet is to socializing what reality TV is to reality."
~Aaron Sorkin

In This Issue

1. TPACK Newsletter Update

The TPACK newsletter currently has 1072 subscribers! This represents a 67% increase during the past year.

2. Recent TPACK Publications

Below are recent TPACK publications that we know about. If you know of others that were published within the past several months, please let us know (tpack.news.editors@wm.edu).

Articles

An, H., & Shin, S. (2010). The impact of urban district field experiences on four elementary preservice teachers' learning regarding technology integration. *Journal of Technology Integration in the Classroom, 2*(3), 101-107.

Archambault, L. M., & Barnett, J. H. Revisiting Technological Pedagogical Content Knowledge: Exploring the TPACK framework *Computers & Education, 55*(4), 1656-1662. Retrieved from http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VCJ-50MN7F2-2&_user=10&_coverDate=07%2F27%2F2010&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=1c719011e33bd749b6b576b1b5445360

Archambault, L., Wetzel, K., Foulger, T. S., & Williams, M. K. (2010). Professional development 2.0: Transforming teacher education pedagogy with 21st century tools. *Journal of Digital Learning in Teacher Education, 27*(1), 1-4.

Baker, M. A., & Bunch, J. C. (2010). CTRL + AL T +DELE TE: Rethinking how we use technology in the AGED classroom. *Agricultural Education Magazine, 83*(3), 9-11.

Chai, C. S., Koh, J. H. L., & Tsai, C-C. (2010). Facilitating preservice teachers' development of Technological, Pedagogical, and Content Knowledge (TPACK). *Journal of Educational Technology & Society, 13*(4), 63-73.

Erdogan, A., & Sahin, I. (2010). Relationship between math teacher candidates' Technological Pedagogical and Content Knowledge (TPACK) and achievement levels. *Procedia - Social and Behavioral Sciences*, *2*(2), 2707-2711.

Finger, G., Jamieson-Proctor, R., & Albion, P. Beyond Pedagogical Content Knowledge: The importance of TPACK for informing preservice teacher education in Australia. *IFIP Advances in Information and Communication* Technology 2010, 324, 114-125. doi: 10.1007/978-3-642-15378-5_11

Guerrero, S. (2010). Technological Pedagogical Content Knowledge in the mathematics classroom. *Journal of Digital Learning in Teacher Education, 26*(4), 132-139.

Harris, J. B., & Hofer, M. J. (2011). Technological Pedagogical Content Knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related instructional planning. *Journal of Research on Technology in Education, 43*(3), 211-229.

Harris, J. B., Hofer, M. J., Blanchard, M. R., Grandgenett, N. F., Schmidt, D. A., van Olphen, M., & Young, C. A. (2010). "Grounded" technology integration: Instructional planning using curriculum-based activity type taxonomies. *Journal of Technology and Teacher Education, 18*(4), 573-605.

Hur, J. W., Cullen, T., & Brush, T. (2010). Teaching for application: A model for assisting pre-service teachers with technology integration. *Journal of Technology & Teacher Education, 18*(1), 161-182.

Jang, S-J. (2010). Integrating the interactive whiteboard and peer coaching to develop the TPACK of secondary science teachers. *Computers & Education, 55*(4), 1744-1751. Retrieved from http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VCJ-50PCM7F-2&_user=10&_coverDate=08%2F04%2F2010&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=9c4652d865e283e1317dfd161fd1f084

Jimoyiannis, A. (2010). Designing and implementing an integrated technological pedagogical science knowledge framework for science teachers professional development. *Computers & Education, 55*(3), 1259-1269. Retrieved from http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VCJ-506RMW3-2&_user=10&_coverDate=11%2F30%2F2010&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=0d2c0730142fd38a0171635622f6c88d

Kereluik, K., Mishra, P., & Koehler, M. (2011). On learning to subvert signs: Literacy, technology and the **TPACK** framework. *California Reader, 44*(2), 12-18.

Koh, J. H. L., Chai, C. S., & Tsai, C. C. (2010). Examining the technological pedagogical content knowledge of Singapore pre-service teachers with a large-scale survey. *Journal of Computer Assisted Learning, 26*(6), 557-63.

LaFee, S. (2010). Taking the 'i21' initiative. *Education Digest, 76*(3), 47-51.

Miller, C., Doering, A. & Scharber, C. (2010). No such thing as failure, only feedback: Designing innovative opportunities for e-assessment and technology-mediated feedback. *Journal of Interactive Learning Research, 21*(1), 65-92. Retrieved from http://www.editlib.org/p/33184

Niess, M. L., van Zee, E. H., & Gillow-Wiles, H. (2010). Knowledge growth in teaching mathematics/science with spreadsheets: Moving PCK to TPACK

through online professional development. *Journal of Digital Learning in Teacher Education, 27*(2), 42-52.

Oster-Levinz, A., & Kleiger, A. (2010). Indicator for Technological Pedagogical Content Knowledge (TPACK) evaluation of online tasks. *Turkish Online Journal of Distance Education-TOJDE, 11*(4). Retrieved from http://tojde.anadolu.edu.tr/tojde40/index.htm

Özgün-Koca, A. A., Meagher, M., & Edwards, M. T. (2009/2010). Preservice teachers' emerging TPACK in a technology-rich methods class. *The Mathematics Educator, 19*(2), 10-20. Retrieved from http://math.coe.uga.edu/TME/issues/v19n2/v19n2_OzgunKoca,%20Meagher,%20&%20Edwards.pdf

Pierson, M., & Borthwick, A. (2010). Framing the assessment of educational technology professional development in a culture of learning. *Journal of Digital Learning in Teacher Education, 26*(4), 126-131.

Polly, D., Mims, C., Shepherd, C. E., & Inan, F. (2010). Evidence of impact: Transforming teacher education with preparing tomorrow's teachers to teach with technology (PT3) grants. *Teaching & Teacher Education, 26*(4), 863-870.

Richardson, K. W. (2010). TPACK: Game on. *Learning & Leading with Technology, 37*(8), 34-35.

Schmidt, D., Harris, J. & Hofer, M. (2010). "Grounded" technology integration using K-6 literacy learning activity types. *Learning & Leading With Technology, 37*(6). 30-32.

Thompson, A. D., & Schmidt, D. (2010). Second-generation TPACK: Emphasis on research and practice. *Journal of Digital Learning in Teacher Education, 26*(4), 125.

Trautmann, N. M., & MaKinster, J. G. (2010). Flexibly adaptive professional development in support of teaching science with geospatial technology. *Journal of Science Teacher Education, 21*(3), 351-370.

Chapters

Doukakis, S., Chionidou-Moskofoglou, M., Mangina-Phelan, E., & Roussos, P. (2010). Measuring technological and content knowledge of undergraduate primary teachers in mathematics. In M. D. Lytras, (Ed.). *Tech-Education 2010: Communications in Computer and Information Science*, vol. 73 (pp. 405-410), Berlin: Springer-Verlag.

Doukakis, S., Koilias, C., & Chionidou-Moskofoglou, M. (2010). Students' satisfaction with an undergraduate primary education teaching practicum design on developing technological, pedagogical and mathematical knowledge. In M. D. Lytras, (Ed.). *Tech-Education 2010: Communications in Computer and Information Science*, vol. 73 (pp. 661-666), Berlin: Springer-Verlag.

Harris, J. B., Mishra, P. & Koehler, M. (2010). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. In Schrum, L., (Ed.). *Considerations on Technology and Teachers: The Best of JRTE* (pp. 181-204), Eugene, OR: ISTE.

Book

"In the recently released Jossey-Bass publication, *Because Digital Writing Matters* by the National Writing Project, with Danielle Nicole DeVoss, Elyse Eidman-Aadahl, and Troy Hicks, these authors discuss the TPACK framework as they describe the complex process of teaching "writing" – a content area that involves many pedagogical decisions about how to teach both process and product. By exploring the ways in which writing is evolving through new technologies such as blogs, wikis, and digital stories, as well as analyzing the physical and virtual spaces in which students collaborate such as computer labs and social networks, *Because Digital Writing Matters* offers readers vignettes of teacher practice that can help frame their discussions and understanding about what it means to teach writing with technology."

3. Recent TPACK Presentations

Coles, D. (2010, June). *An introduction to TPACK.* Paper presented at the 2010 Canadian eLearning Conference, Edmonton, Alberta. Retrieved from http://mrcoles.wordpress.com/2010/06/23/celc-2010-an-introduction-to-tpack/

Jamieson-Proctor, R., Finger, G. & Albion, P. (2010, April). *Auditing the TPACK capabilities of final year teacher education students: Are they ready for the 21st century?* Paper presented at the Australian Computers in Education Conference 2010, Melbourne, Australia. Retrieved from http://acec2010.info/proposal/248/auditing-tpck-capabilities-final-year-teacher-education-students-are-they-ready-21st .pdf of paper

Jimoyiannis, A. (2010, June). *Developing a Technological Pedagogical Content*

Knowledge framework for science education: Implications of a teacher trainers' preparation program. Paper presented at the Informing Science & IT Education Conference (InSITE) 2010, Cassino, Italy. Retrieved from http://proceedings.informingscience.org/InSITE2010/InSITE10p597-607Jimoyiannis867.pdf

4. Recent TPACK-Related Dissertations

The following TPACK-based dissertations have come to our attention recently. There may be more… (and if so, you know whom to contact with that information ☺).

Liaw, H. (2010). *Using online primary source resources in fostering historical thinking skills: The pre-service social studies teachers' understanding. Dissertation Abstracts International: Section A, 71*(09), (AAT 3420677).

Abstract:
This dissertation entailed a qualitative case study on the confluence of technology and social studies in fostering a constructivist education. Through the examination of pre-service social studies teachers' understanding of the online primary source resources (OPSR), three themes emerged. The first exposed the fragmented understanding of important pedagogical theories of constructivism and historical thinking among participants; the second suggested that OPSR was mostly valued by pre-service teachers for its provision of primary sources; and the third related to how pre-service teachers viewed the current state of technology and context as problematic for technology integration. Accordingly, four findings were revealed. First, the pre-service teachers in the study demonstrated a limited understanding of the application of foundational theories central to their field of study; second, there were instances of deeper appreciation of the potential of OPSR, indicating that pre-service teachers' theoretical understanding is nascent and may deepen over time; third, the full potential of technologies such as OPSR was not recognized; and fourth, the pre-service teachers' perceptions of school and educational system conditions tended to negatively influence their views toward the integration of technology into their teaching practices. Implications indicate that first, foundational pedagogical theories are critical with regard to technology integration in education and as such teacher preparation programs must not assume what is taught is what is learned; second, instances of deeper understanding among pre-service teachers only appeared during the application of their theoretical understandings; third, context is critical in how OPSR would be used in classrooms and such contextual issues must not be ignored by teacher preparation programs; and fourth, teachers' technological pedagogical content knowledge (PCK/TPCK) is critical in the integration of technology in education.

Lux, N. J. (2010). *Assessing Technological Pedagogical Content Knowledge. Dissertation Abstracts International: Section A, 71*(12), (AAT 3430401).

Abstract:
Building on Shulman's (1986) theory of pedagogical content knowledge that outlines distinct domains of teacher knowledge, *technological pedagogical* content knowledge (TPACK) has emerged as a framework for examining educational technology training in teacher preparation (Koehler & Mishra, 2008; Neiss, 2008; Shin, Koehler, Mishra, Schmidt, Baran, & Thompson, 2009). The research presented here examines the theoretical basis of TPACK and describes the process of developing the Pre-service Teacher - Technological Pedagogical Content Knowledge Survey (PT-TPACK Survey). The PT-TPACK Survey is an instrument constructed to measure self-perceptions of TPACK in pre-service teachers completing a "Foundations of Educational Technology Course". The research focused on collecting evidence for the validity and reliability of the PT-TPACK survey. A pilot study, understandability study, and expert review were conducted in early stages of the research. Exploratory and confirmatory factor analysis and reliability measures were analyzed after the survey was administered to 120 pre-service teachers. The factor structure suggests a superior model fit, as did the goodness-of-fit indices. The root mean square error of approximation (RMSEA) was equal to .013, and both the comparative fit index (CFI) and non-normed fit index (NNFI) were ≥ .90 (CFI=1.0, NNFI=1.0). Internal consistency between the individual factors was also strong. The resulting coefficient alpha statistics suggest instrument reliability (TPACK, α=.903; TPK, α=.844; PK, α=.771; CK, α=.774; TK, α=.747; PCK, α=.653). Six of the seven widely accepted hypothesized TPACK dimensions emerged in the factor structure. Technological content knowledge (TCK) was the only hypothesized dimension that did not emerge. Finally, this study recommends several reasons for the lack of the TCK dimension, some of which could have an impact on how teachers are trained to use technology.

Plair, S. K. (2010). On becoming technology fluent: Digital classrooms and middle aged teachers. *Dissertation Abstracts International: Section A, 72*(01), (AAT 3435097).

Abstract:
This dissertation, organized in chapter format, is comprised of a collection of case studies designed to explain why some teachers are not prepared to meet the challenges of the National Education Technology Plan despite the pervasive evidence of technology in our personal and professional lives. The first case study is the personal history of one teacher who "battles the machine" and is reluctant to alter what works in her current practice. The next chapter is a multiple case study that examines the issues and challenges experienced teachers faced in their efforts to become more fluent in the use of educational technology. Using an extensive technology related professional development event as an intervention, the study explores teachers' use of technology before

and after the inservice, the role of professional development in building technology skills, and matters related to the sustainability of skills. Teachers stressed the need for ongoing support in the form of a knowledge broker to assure continued efficacy and proficiency while integrating technology into their content and their practice. The fourth chapter, after a five year lapse, revisits two teachers from the previous multiple case study and introduces a new tech savvy teacher who shares her experiences as a new integrator of technology. Self report is used to examine the issues and challenges these experienced teachers faced in their efforts to become more fluent in the use of educational technology. The teachers in this multiple case study participated in a number of technology related professional development interventions over a period of approximately four years. This chapter includes their reflections on the successes and failures as they continue to grapple with the challenges of increasing their technological, pedagogical, and content knowledge or TPACK and create change in their practice. Included is an essay presenting a proposal for a framework of five phases of professional development to support the federal government policies of No Child Left Behind and the National Education Technology Plan. The framework is upheld by five principles of professional development considered crucial for effectively changing teacher practice to incorporate instructional technology into the curriculum. By superimposing these principles: duration, content, active learning, and collaboration, this essay then positions technology related professional development as ongoing with the support of professional learning communities or networks and knowledge brokers as a means of sustaining and expanding the efforts teachers make toward technology fluency. The concluding chapter discusses how education systems constrain teachers' effort or ability to changes. Recommendations are provided on how relations among teachers and institutions might be reconfigured to promote more and better professional learning and practice in technology.

(The following dissertation may be the first that was based upon Mishra & Koehler's conceptualization of TPACK. We found it recently.)

Youmans, M. J. (2006). *When, where, how, and why Berkshire County high school teachers use the Internet for teaching and learning. Dissertation Abstracts International: Section A, 67*(10), (AAT 3238849).

Abstract:
This study draws on both quantitative and qualitative data collected from public and private high school teachers in Berkshire County, Massachusetts, to describe their current uses of, beliefs about, and knowledge base surrounding the Internet for teaching and learning. An underlying assumption of this study is that before the outcomes of teachers' uses of the Internet can be addressed, there must first be a clear understanding of how teachers are actually using it for preparation, instruction, and student-directed work. 142 teachers responded to a survey about their most prevalent uses of the Internet, as well as their perceptions about both its value and the obstacles that prevent its effective

deployment. Nine participants were chosen from six of the schools to provide richer detail and further examples of major trends discovered in the survey data. The grounded theory, complementary methods study elicited themes that suggest how and why the preponderance of the participants are currently using the Internet to inform and enrich their professional practice and suggest a new domain of teacher knowledge, namely technological pedagogical content knowledge. Key factors influencing teachers' decisions about Internet use include their perceptions about its importance for teaching and learning as well as about the obstacles it poses. The study is significant both in adding to the current knowledge of how some teachers are using the Internet to enhance their craft, offering a methodological lens supporting a multiple measures approach to assessing and understanding teachers' use of technology, and developing a theoretical framework for understanding the particular kind of knowledge Internet-using educators possess. It closes by suggesting a fruitful area for future research and professional development lies in helping teachers build their technological pedagogical content knowledge.

5. Other TPACK Resources

Tae Shin, Punya Mishra, and Matt Koehler at Michigan State University have spent considerable time and effort putting together a TPACK bibliography with about 250 entries – as Matt says, "not by any means complete, but a good start…and the most comprehensive TPACK bibliography out there" – and are hoping that their work might be of use to others.
http://mkoehler.educ.msu.edu/tpack/partial-bibliography-of-tpack-related-works/
http://www.mendeley.com/groups/522011/tpack/papers/

On the recommendation of the members of SITE's TPACK SIG, we have established four TPACK-related email discussion lists:

- tpack.research
- tpack.teaching
- tpack.grants
- tpack.future

Instructions for how to subscribe to these lists are on the SITE TPACK SIG's Web page: http://site.aace.org/sigs/tpack-sig.htm. (Please note that we will soon be retiring the TPACK Google Group, also in accordance with the decision made at the 2010 TPACK SIG meeting.)

Matt Koehler has posted an online version of the popular "TPACK Game," which was created originally for use at the 2007 National Educational Technology Leadership Symposium in Washington, DC (USA). There are multiple versions of the TPACK Game circulating at present, including: Karen Richardson's version (see new articles, above), Petra Fisser's version (in Dutch), Michael Porter's version, and the original version played at NTLS 2007.

Jordy Whitrmer at the Birmington Covington School, in the Birmingham Public Schools in Bloomfield Township, Michigan, USA, created a TPACK WebQuest. Jordy says, "This WebQuest is designed to first familiarize you with the TPaCK framework, then to examine and discuss examples that combine the three bases to different degrees and success, and finally to help you define the areas of interplay in your own words."
http://ignite.wikis.birmingham.k12.mi.us/TPaCK+WebQuest

Students at Michigan State University have written and filmed a clever TPACK Rap: "Jamie has a nightmare involving TPACK chasing her around the campus of Rouen Business School."
http://www.youtube.com/watch?v=bEj9eA49dzU

6. TPACK at Upcoming Conferences

We're happy to report that there will be 51 TPACK-based sessions at the SITE 2011 conference in Nashville, Tennessee, USA, Tuesday, Monday, March 7 through Friday, March 11, 2011. We will be sending a list of each and all of these sessions in a special "TPACK Conference Edition" of the TPACK Newsletter late next week to assist your conference planning.

We're also happy to report that there will be 12 TPACK-focuses sessions at the annual meeting of the American Educational Research Association (AERA) conference in New Orleans, Louisiana, USA, Friday, April 8 through Tuesday, April 12, 2011. We will include specific information about these sessions in the upcoming special conference edition of this newsletter, too.

The Call for Participation in the International Society for Technology in Education (ISTE)'s annual conference (Sunday, June 26 – Wednesday, June 29, 2011 in Philadelphia, Pennsylvania, USA) specifically requested presentations that address educators' TPACK by saying:
"We are looking for:

- Content that increases both the technical knowledge and **the technological pedagogical content knowledge (TPACK) of educators and teacher candidates,** as well as the leadership skills of students and educators
- Systems, models, promising practices, and strategies for achieving digital-age learning in formal and informal learning environments, face to face and virtual
- Models of how to achieve the NETS and examples of the NETS in action
- Technical content that is appropriate for all levels of expertise, from beginner to advanced"

The next issue of this TPACK Newsletter will provide specific information about the 6 TPACK-based sessions that are scheduled for presentation at the ISTE conference, too.

7. TPACK Work in Progress

At National-Louis University in Chicago (with additional campuses in Wisconsin and Florida), a TPACK faculty development project is in its third year. Funded by a grant from the Senate Faculty Development Committee (with additional funds from each department, plus the deans of the Colleges of Education and Arts and Sciences), the NLU TPACK project helps small communities of inquiry to identify shared needs, garner resources and training, and develop technology-enhanced lesson plans and units, including projects to enhance the professional development of NLU faculty and adjunct instructors. The TPACK concept serves as the conceptual framework for the project, helping teams to focus on the intersections of technology, pedagogy, and content knowledge. For more information, please contact Craig A. Cunningham, a member of the Technology in Education faculty, at craig.cunningham@nl.edu.

8. Other Types of TPACK

Our online searches have surfaced TPCK/TPACK in both pharmacology and business, in addition to education.

TPCK is also an acronym for "Tosyl phenylalanyl chloromethyl ketone:"
http://en.wikipedia.org/wiki/File:Tosyl_phenylalanyl_chloromethyl_ketone.PNG
(TPCK diagram)
http://content.karger.com/ProdukteDB/produkte.asp?doi=71466&hl=1&q=tpck
(How TPCK protects injured brains in baby rats)

TPACK is also the name of a telecommunications company in Denmark:

"Since 2001, TPACK has been providing some of the world's largest telecommunication equipment manufacturers with leading edge technology and solutions for efficient packet transport. Specifically, TPACK provides the chip solutions and the supporting software that implement the intelligence in telecom systems. TPACK's experience and expertise in both data and telecom networks has proven to be decisive in TPACK's success to date."
http://www.tpack.com/about-tpack/company-overview.html

The TPACK company was acquired by Applied Micro in summer/fall 2010:
http://phx.corporate-ir.net/preview/phoenix.zhtml?c=78121&p=irol-newsArticle&ID=1473624&highlight=tpack

9. Learning and Doing More with TPACK

Interested in learning more about TPACK or getting more involved in the TPACK community? Here are a few ideas:

- Visit and contribute to the TPACK wiki at: http://tpack.org/
- Join the TPACK SIG at: http://site.aace.org/sigs/tpack-sig.htm
- Subscribe to the tpack.research, tpack.teaching, tpack.grants and/or tpack.future discussion lists at: http://site.aace.org/sigs/tpack-sig.htm
- Access the TPACK Learning Activity Types at: http://activitytypes.wmwikis.net/

Feel free to forward this newsletter to anyone who might be interested in its contents.

Even better, have them subscribe to the TPACK newsletter by sending a blank email to sympa@lists.wm.edu, with the following text in the subject line: subscribe tpack.news FirstName LastName (of course, substituting their own first and last names for 'FirstName' and 'LastName' — unless their name happens to be FirstName LastName, in which case they can just leave it as is).

If you have a news item that you would like to contribute to the newsletter, send it along to: tpack.news.editors@wm.edu

Standard End-Matter

If you have questions, suggestions, or comments about the newsletter, please send those to tpack.news.editors@wm.edu. If you are subscribed to the tpack.news email list, and — even after reviewing this impressive publication — you prefer not to continue to receive the fruits of our labors, please send a blank email message to sympa@lists.wm.edu, with the following text in the subject line: unsubscribe tpack.news

- Judi & Mark

…for the SITE TPACK SIG leadership:
Judi Harris, Co-Chair, College of William & Mary
Mark Hofer, Co-Chair, College of William & Mary
Mario Kelly, Futon, Hunter College
Matt Koehler, Chaise Lounge, Michigan State University
Punya Mishra, Recliner, Michigan State University