TPACK Newsletter, Issue #7.2: Special SITE & AERA Conference Issue
March-April 2010

Welcome to the seventh edition of the TPACK Newsletter, published four times each year between September and April. If you are not sure what TPACK is, please surf over to http://www.tpack.org/ to find out more.

Gratuitous Quote About Technology

"For a list of all the ways technology has failed to improve the quality of life, please press three." ~Alice Kahn

In This Issue

1. Update on Newsletter

The TPACK newsletter currently has 707 subscribers! In addition to being a palindromic number, this also represents a 9.2% increase in membership during the last two months.

Many thanks to those of you who sent in corrections so quickly to version 7.0 of this newsletter! We have incorporated them in this 7.2 edition.

2. TPACK SIG Meeting at SITE 2010 in San Diego

The TPACK SIG meeting is scheduled for Wednesday, March 31 from 8 – 9 AM in the Marina 3 room at the SITE Conference 2010 in San Diego, California. Please mark your calendars. More information about TPACK-related papers and presentations at SITE can be found below.

There are some leadership opportunities in the SIG that may be of interest to members (faculty and graduate students). We hope to welcome many at the meeting. We look forward to seeing you there.

3. Recent TPACK Publications & Presentations

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

Articles/Chapters

Blanchard, M. R., Harris, J., & Hofer, M. (2010). Grounded tech integration: Science. *Learning & Leading With Technology, 37*(6). 32-34.

Abstract:
"The article discusses the application of grounded technology integration in teaching science. The authors point out that one strategy that will allow teachers to integrate technology effectively is by focusing on instructional planning. They also suggest matching technology-integration strategies to planning for teachers. They mention the creation of 38 science learning activity types for building and expressing science concept and knowledge. They describe the SMART Project participated by thirty science teachers from two school districts in North Carolina."

Figg, C. & McCartney, R. (2010). Impacting academic achievement with student learners teaching digital storytelling to others: The ATTTCSE digital video project. *Contemporary Issues in Technology and Teacher Education*, *10*(1). Retrieved from http://www.citejournal.org/vol10/iss1/languagearts/article3.cfm

Abstract:
"University researchers, teacher candidates, language and technology instructors, student learners, and families from diverse backgrounds partnered in an invitational teaching/learning experience—middle school student learners teaching their VIPs (very important persons) how to create stories and construct digital movies with reference to their family history. Prior to a university-based workshop, 2 weeks of structured activities using the Model of Digital Storytelling (Figg, 2005) focused on rich language development, oral history, and movie-making technology in a community-based summer enrichment program designed for underachieving student learners. Teacher candidates facilitated the workshop interaction between student learners and their VIPs. Data sources included interviews, exit surveys, reflective journals, research field notes, and student/parent-created artifacts. All participants were positively impacted through this digital storytelling process. Noted improvement of writing and technical skills, increased motivation due to VIP involvement,

and greater awareness of future educational opportunities for student learners were among the key findings of this study."

Grandgenett, N., Harris, J., & Hofer, M. (2009). Grounded tech integration: Math. *Learning & Leading With Technology, 37*(3), 24-26.

Groth, R., Spickler, D., Bergner, J., & Bardzell, M. (2009). A qualitative approach to assessing technological pedagogical content knowledge. *Contemporary Issues in Technology & Teacher Education, 9*(4), 392-411. Retrieved from http://www.citejournal.org/vol9/iss4/mathematics/article1.cfm

Abstract:
"Because technological pedagogical content knowledge is becoming an increasingly important construct in the field of teacher education, there is a need for assessment mechanisms that capture teachers' development of this portion of the knowledge base for teaching. The paper describes a proposal drawing on qualitative data produced during lesson study cycles to assess teachers' development of technological pedagogical content knowledge. The specific qualitative data sources include teachers' written lesson plans, university faculty members' reviews of lessons, transcripts and videos of implemented lessons, and recordings and transcripts of debriefing sessions about implemented lessons. Using these data sources, inferences about teachers' technological pedagogical content knowledge are drawn and validated. An example of the implementation of this lesson study technological pedagogical content knowledge (LS-TPACK) assessment model is provided. The example includes inferences drawn about high school teachers' technological pedagogical content knowledge in the context of two lesson study cycles that involved teaching systems of equations with graphing calculators. Reflections on the strengths and weaknesses of the LS-TPACK model are included from a qualitative perspective, as well as from a psychometric perspective."

Hardy, M. (2010). Enhancing preservice mathematics teachers' TPCK. *Journal of Computers in Mathematics and Science Teaching, 29*(1), 73-86. Retrieved from http://www.editlib.org/p/33136

Abstract:
"The goal of the X-Tech project was to enhance preservice teachers' perceptions of their preparedness to teach with technology. Results indicated that practically-oriented methods that meet a variety of technology related needs are viable for attaining such a goal. Further, it is particularly beneficial to have teachers use a variety of resources to explore problems relevant to the level at which they will teach, plan technology-infused lessons, and critique technological resources. Finally, the structure of the methodology employed in the Project can serve as a model for similar efforts to prepare preservice teachers to teach with technology."

Kramarski, B. & Michalsky, T. (in press). Preparing preservice teachers for self-regulated learning in the context of technological pedagogical content knowledge. *Learning and Instruction.* Doi:10.1016/j.learninstruc.2009.05.003

Abstract:
"The present study investigated effects of two hypermedia environments on 95 preservice university teachers' self-regulated learning (SRL) in the context of technological pedagogical content knowledge (TPCK): hypermedia with metacognitive instruction (HYP + META) and without (HYP). The study combined online reflections with self-report measures to assess SRL processes. Results showed that exposure to metacognitive support using the IMPROVE self-questioning method may enhance preservice teachers' ability to reflect on and regulate their learning processes. This, in turn, can develop their TPCK, both as learners (comprehension skills) and as teachers (design skills). Further analysis indicated high correlations within SRL measures (self-reports, online reflections) and between SRL and TPCK tasks. Implications are discussed for teacher training in SRL-integrated TPCK contexts."

Lee, M. H. & Tsai, C. C. (2010). Exploring teachers' perceived self-efficacy and technological pedagogical content knowledge with respect to educational use of the World Wide Web. *Instructional Science, 38*(1), 1-21. Retrieved from http://www.springerlink.com/content/d510480505435104/

Abstract:
"Research in the area of educational technology has claimed that Web technology has driven online pedagogy such that teachers need to know how to use Web technology to assist their teaching. This study provides a framework for understanding teachers' Technological Pedagogical Content Knowledge-Web (TPCK-W), while integrating Web technology into their pedagogical practice. Furthermore, contemporary educational researchers have highlighted the significance of teachers' self-efficacy, conceptualized as the teachers' perceptions of their own competence at teaching, and related to instructional strategies as well as teaching effectiveness. The major purpose of this study was to investigate teachers' perceived self-efficacy in terms of their TPCK-W. This study aimed to develop a new questionnaire, namely the Technological Pedagogical Content Knowledge-Web (TPCK-W) Survey to explore teachers' self-efficacy in terms of their TPCK-W, and additionally to assess their attitudes toward Web-based instruction. The participants in this study were 558 teachers from elementary school to high school level in Taiwan. Both exploratory and confirmatory factor analyses indicated that the TPCK-W survey developed in this study has satisfactory validity and reliability characteristics. The results indicate a lack of general knowledge about Web-related pedagogy amongst the teachers surveyed. The correlations between teachers' self-efficacy in terms of their TPCK-W, their attitudes regarding Web-based instruction, and their background variables were also examined. Correlations were found between self-efficacy and positive attitudes to web-based instruction. Older and more experienced teachers

were found to have lower levels of self-efficacy with respect to TPCK-W, though teachers with more experience of using the web (including for instruction) had higher levels of self-efficacy with respect to TPCK-W."

Pan, N., Lau, H., Lai, W. (2010). Sharing e-learning innovation across disciplines: An encounter between engineering and teacher education. *Electronic Journal of e-Learning. 8*(1). Retrieved from http://www.ejel.org/Volume-8/v8-i1/v8-i1-art-4.htm

Abstract:
"One of the major teaching challenges of higher education is helping students to bridge knowledge with real life practice. This is especially important in applied fields including medicine, social science, education and engineering. Traditionally, practicum and internship programs are the only means for students to step outside of classroom learning and to connect with the outside world, and a chance to apply what they learn to real life problems. Increasingly, information and communication technology (ICT) is being used to create yet another dimension for authentic learning beyond the boundaries of the classrooms, and in addition afford collaborative and flexible learning mode. This paper details a collaborative effort between the engineering and the education disciplines, in using ICT to support students' professional growth in teacher education. An eLearning platform was created as a result of the joint effort for the training of student teachers in developing their professional knowledge in teaching and learning and gaining understanding of the work of a teacher. Through the platform, student teachers gain understanding about the teaching profession from different people of the education sector; and they can reflect and share their teaching practicum experiences with each other using the online communication tools."

Tanti, M., & Moran, W. (2009). Warts and all: Integrating ICT in teacher training. *International Journal of Learning, 16*, 641-655.

Abstract:
"This paper examines a retrospective view of a final year secondary teacher education unit which has explored the use of an integrative method. Over a period of three years the unit has utilised an interdisciplinary approach in teaching the content of the unit using information and communication technologies (ICT). Each year a team of four staff undertook the teaching of this unit and brought together skills and knowledge from different curriculum areas. Two of the teaching staff have consistently delivered this unit over the three year period and here review the success and difficulties encountered over this time. An honest and open evaluation based upon student and staff responses of the unit will be presented in this paper giving a practical viewpoint to ICT integration. Issues encountered such as expertise of staff, resource availability, willingness of students to learn in a different framework, willingness of staff to teach in a different framework, achievement of student outcomes, organisational structure,

and valid assessment strategies are explored and discussed. Recommendations for future initiatives in using interdisciplinary approaches involving ICT are provided to give university teachers a framework on which to base their own future practice."

Van Olphen, M., Hofer, M., & Harris, J. (2009-10). Grounded tech integration: Languages. *Learning & Leading With Technology. 37*(4), 26-28.

Abstract:
"The article offers information on various methods and techniques to integrate technology into world language instruction. It states that to aid teachers integrate technology in world languages effectively one needs to focus on instructional planning. As per the article, the world-language activity types can be divided into five genres that address different skill families namely--listening, speaking, reading, writing, and viewing. These can again aid in technology integration in world language instruction. It adds that by combining activity types in an instructional plan, teachers can address the five organizing principles namely communication, cultures, connections, comparisons, and communities."

Wang, Q. (2009). Guiding teachers in the process of ICT integration: Analysis of three conceptual models. *Educational Technology, 49*(5), 23-27. Retrieved from http://qywang.myplace.nie.edu.sg/Publications.htm

Abstract:
"The rapid development of emerging technologies has resulted in the availability of a number of information and communication technologies (ICT) tools. Teachers must have the competency to choose and integrate proper tools into teaching and learning. Over the years, a number of conceptual models have been developed to guide the process of ICT integration. Some of the models look similar on the surface but are different in many aspects. Better discernment of the differences will enable teachers to follow the models more appropriately. This article compares the differences among the TPACK, PST, and CoI models on the key components of content, pedagogy, social interaction, and technology."

Whitehouse, P., McCloskey, E., & Ketelhut, D. J. (2009). Online pedagogy design and development: New models for 21st century online teacher professional development. In J. O. Lindberg & A. D. Olofsson (Eds.), *Online learning communities and teacher professional development: Methods for improved education delivery* (pp. 247-262). Hershey, PA: IGI Global.

Young, C., Hofer, M., & Harris, J. (2010). Grounded tech integration: English Language Arts. *Learning & Leading With Technology, 37*(5), 28-30.

Abstract:
The article presents the fourth part of a series of articles that focus on grounded technology integration. The authors discuss the emerging technologies used in

the English language arts (ELA) subject. They point out that these technologies offer both new modes and media for communication and challenges for teachers. They suggest that teachers should focus on instructional planning when trying to integrate technology effectively. They also mention that there are 65 learning activity types for secondary ELA teaching and learning that feature the primary ELA processes that include reading, writing and language use.

Presentation(s)

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

Abstract:
"The expectations for teacher education graduates having appropriate information and communication technology (ICT) capabilities to meet the challenges of learning and teaching in the 21st century are widely accepted. However, it should not be assumed that tomorrow's teachers will enter their profession with those ICT capabilities. The conceptual framework of Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006, AACTE Committee on Innovation and Technology, 2008) was used to guide the study undertaken in 2009 of final year students in two Universities in Queensland, Australia. The findings are compared with those reported in an earlier study (Watson et al., 2004) which found that there was a limited band of applications with which the participants expressed high levels of competence. Importantly, high percentages of participants perceived themselves to have no competence with applications such as multimedia development, visual thinking software and digital video editing which could be particularly stimulating for learning outcomes in their future students. Furthermore, participants' self-perception of their confidence to integrate ICT into student learning also revealed that the percentage of participants who rated themselves as having no or limited confidence with particular integration examples was of concern. This paper provides a summary of some of the findings of the TPACK capabilities of the student teachers studied in 2009, which reveal important insights to inform the review and design of teacher education programs to more directly address TPACK capabilities. The study suggests that teacher education programs tend to have been designed using Pedagogical Content Knowledge (PCK) (Shulman, 1986, 1987) where students undertake studies in a range of curriculum (content, disciplinary) courses, pedagogy courses, and professional studies (practicum, Internship) courses, and this is now insufficient as TPACK capabilities are needed."

4. Recent TPACK-Related Dissertations

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

Chase, E. (2009). *Extension educators' perceptions of the use of digital technology in their work.* Michigan State University, Lansing, MI. AAT 3381427

Abstract:
"This research study examined Michigan State University Extension educators' perceptions of the use of digital technology in their work. It used a mixed method of research which included a mailed survey and interviews of selected respondents. A census survey using Dillman's Total Design method was sent to 290 field staff of Michigan State University Extension. Of these, 272 completed and returned the survey instrument for a 94% rate of return. Semi structured interviews were conducted with 15 of the respondents to provide in-depth qualitative data to enrich the understanding of the issues for the researcher. The mailed survey instrument was examined for validity by a panel of experts and pilot tested on scale items to assess reliability. The mailed survey included questions on access to technology both at work and at home, preparation for the use of technology, actual use of technology, usefulness and ease of use, confidence and comfort in use and general and technical support for the use of technology. Low, medium and high total use respondent were compared and analyzed. Results show that although Extension Educators consider themselves to be well prepared to use technology and said it was highly useful to them in their work, most use of technology was limited to e-mail, word processing, file attachments and cell phones. Only a small minority use web technology, wikis or had published educational materials on a website or the MSUE portal. Staff sometimes furnished their own digital technology tools if they thought they were highly useful. Barriers to use of newer technologies were sited as lack of access, lack of support, lack of time to learn new technologies. Low users sometimes said they would only use technology if it was required and they preferred one-on-one tutoring to learn how to use technology. Low users recognized that they were themselves a barrier to the use of technology. Medium users said clientele preferred face-to-face education and would not use technology. They often viewed technology as "somebody else's problem". High users were the only group to use web based digital technology and they were able to integrate the three spheres of Mishra and Koehler's TPACK model of technology use; expertise in technology, pedagogy and content. High users were more apt to be self taught, client oriented and to have a grasp of the affordances of various technology applications. They preferred advanced classes on web page design, as well as photo and video editing and production. Recommendations were to provide local and regional training which includes practical ways to use technology to enhance programming, identify regional sources of support, integrate technology use into the MSUC culture and encourage the use of technology by highlighting creative solutions to use and providing opportunities for playful use. Better access must be provided and technology support should

be easily accessible. Further research recommendations include case studies of individual counties, case studies of high users, research on difference by programming area and the development of documented technology solution to programming needs which could be accessed by educators looking for ideas."

Nathan, E. J. (2009). *An examination of the relationship between preservice teachers' level of technology integration self-efficacy (TISE) and level of technological pedagogical content knowledge (TPACK).* University of Houston, Houston, TX. AAT 3388727

Abstract:
"The purpose of this study was to examine and identify the relationship between preservice teachers' level of technology integration self-efficacy (TISE) and their level of technological pedagogical content knowledge (TPACK). Survey responses were solicited from 197 preservice teachers who are Interdisciplinary Studies Majors in the Quality Urban Education for Students and Teachers (QUEST) program at the University of Houston (UH). The preservice teachers are all pursuing EC-6 and 4-8 certifications, which includes elementary and middle grade levels. All participants responded to a survey designed to assess their technology integration confidence and knowledge. The QUEST program, like many teacher education programs, focuses on preparing preservice teachers to enter future technology-based teaching and learning environments.
The two constructs TISE and TPACK were used to explore preservice teachers' technology integration confidence and knowledge levels. The preservice teachers' level of TISE and level of TPACK were the primary variables of interest in this study. These variables are important because T1SE and TPACK are measurable factors that play influential roles in preservice teachers' technology integration performances.
The variables used in this quantitative study, level of TISE and level of TPACK, were measured using items from existing TISE and TPACK surveys. The items from both the Technology Integration for Self-Efficacy Scale (Perkmen, 2008) and the Survey of Preservice Teachers' Knowledge of Teaching and Technology (Schmidt, Baran, Thompson, Mishra, Koehler, and Shin, 2009) were combined to create a survey instrument consisting of 63 items using a Likert 5-point scale. The resulting survey instrument, the TISE/TPACK Survey , was used to collect the data in this study. The data were analyzed using descriptive and inferential statistics. The results from this research study showed a moderate relationship between the preservice teachers' levels of TISE and TPACK.

However, this researcher recommends ongoing assessments of preservice teachers' level of TISE and TPACK in order to better understand the influence of these two intrinsic factors have on preservice teachers' technology integration performance outcomes."

Sheffield, C. C. (2009). *A multiple case study analysis of middle grades social studies teachers' instructional use of digital technology with academically talented students at three high-performing middle schools.* University of South Florida, Tampa, FL. AAT 3394182

Abstract:
"Appropriate education for academically talented students incorporates the use of complex thinking skills, and encourages the development of interpersonal and leadership skills. One potential tool to achieve these goals is the use of instructional technology. Siegle (2004a, 2005) suggests that it is particularly appropriate to utilize technology with the highly-able because they often possess skills that are effective when using today's technology, specifically abstract thinking and rapid processing. This mixed methods multiple case study explored middle school social studies teachers' instructional use of digital technology to teach highly-able students. The participant teachers were from three high-performing schools, as identified by each school's performance on the state standardized test, and in the school's achievement of AYP. The participants at each school were asked to complete the Internet Use Survey, modified from VanFossen's survey (1999, 2005) and participate in a group interview to gather related information not addressed in the survey. From this larger group of teachers, ten teachers were asked to participate in further study. These ten teachers participated in an interview, submitted instructional-related documents for one month, and were observed in a self-identified, typical technology integration lesson. Findings from this study indicate that the participant teachers viewed technology integration as being beneficial to the education of the academically talented student. However, their practice did not reflect this importance. The participant teachers largely used available classroom technology for teacher-centered activities, including information gathering and presentation. Students were rarely engaged in higher-order thinking tasks using the available technology. The participant teachers identified a number of barriers to their technology integration, primarily equipment functionality and availability. Despite the widespread equipment concerns, one teacher utilized the school's available technology to engage academically talented students in student-centered instructional activities. The Technological Pedagogical and Content Knowledge (TPACK) conceptual framework can be used to examine why this one teacher used technology differently than the other participant teachers. Additionally, using this teacher's example and the TPACK framework, suggestions for teacher professional development are provided."

5. TPACK at California Council on Teacher Education Spring Conference

The annual meeting of the California Council on Teacher Education (March 25 – 27, in San Jose) has a strong TPACK thematic focus. There will be keynote presentations and panel discussions led by TPACK regulars like Punya Mishra, Judi Harris, Glen Bull and Mario Kelly.
http://www.ccte.org/conferences/

6. Coming up: TPACK at SITE 2010

Here is a list of presentations related to TPACK at the SITE conference at San Diego, March 29 – April 1. There are 35 papers, presentations, poster sessions and symposia related to TPACK that will be included in this conference. Please note the SIG meeting at 8 – 9 am on Wednesday, 3/31/10 as well. Specific locations and times for the presentations can be found on the SITE Conference Web site.

We have tried to capture all of the entries but if we missed yours (or one that you know about), do let us know (tpack.news.editors@wm.edu).

Tuesday, March 30

SITE's Digital Fabrication Initative
Glen Bull, University of Virginia, USA; Gary Marks, SITE, USA; Nick Sanham, Aspex, UK; Willy Kjellstrom, University of Virginia, USA

Abstract:
"Desktop manufacturing – personal digital fabrication – is bringing "revolutionary changes for manufacturers and consumers." SITE is leading the way to introduce students to the excitement and power of digital fabrication. In this session Nick Sanham will demonstrate a 3D visualization and modeling program, FabLab ModelMaker, designed to support digital fabrication in schools. SITE's executive director, Gary Marks, will describe an open-source digital fabrication library that SITE is establishing to support and encourage instructional use of digital fabrication. SITE's new digital fabrication special interest group (SIG) will be formed during this session, and information about ways to incorporate digital fabrication into teacher preparation will be provided."

Digital Skills as a Basis for TPCK
Leikny Ogrim, Oslo University College, Norway

Abstract:
"Pupils in today's elementary and secondary schools are in need totally different skills than 40 years ago. When they finish school, they must deal with technology-dense communities that are more complex than previously and continuously changing. This places new demands on schools and their teachers. TPCK is a suitable model to describe the skills teachers need to provide adequate teaching for their students' future. This paper presents results from

research on newly qualified teachers about their digital literacy, their use of ICT in their work practices and various factors that may affect this. The survey focused particularly on teacher education. In this paper, I argue that teachers' (and students') need for digital user skills are undervalued and under communicated with regards to pedagogical and content knowledge. The paper concludes that the emphasis on digital skills in teacher education will lead to graduated teachers having the ability to use technology intensively in their teaching and learning facilitation; in other words, they have TPCK."

Wednesday, March 31

The Decision-Making Processes of Preservice Teachers as They Integrate Technology

Charles R. Graham, Brigham Young University, USA; Nicolette Burgoyne, Brigham Young University, USA; Jered Borup, Brigham Young University, USA

Abstract:
"The TPACK framework is being used increasingly as teachers and preservice teachers plan how to integrate technology into their lesson plans. Several researchers have been examining teacher reflections on the benefits of using technology from data obtained through interviews. This research seeks to understand how preservice teachers go about making decisions about the use of technology in their teaching before and after taking a traditional technology integration course. In the study preservice teachers are give three lesson design scenarios before and after taking a course. The paper explores their instructional design decisions and their rationales for the ways that they integrated their technology knowledge and pedagogical knowledge."

Differentiating TPACK Development: Using Learning Activity Types with Inservice and Preservice Teachers

Mark Hofer, College of William and Mary, USA; Judith Harris, College of William and Mary, USA

Abstract:
"As teacher educators have begun to recognize and acknowledge the complexity of teacher knowledge for technology integration, currently conceptualized as technological pedagogical content knowledge (TPACK), researchers are exploring multiple ways to help inservice and preservice teachers develop this highly situated, interdependent professional knowledge. In this article we overview the Learning Activity Types (LAT) approach to TPACK-building that we have developed, and document how we utilize the approach in differentiated ways for preservice and inservice teachers."

Strategies for Teacher Professional Development of TPACK, Part 1 & 2

Joke Voogt, University of Twente, Netherlands; Ann Thompson, Iowa State University, USA; Punya Mishra, Michigan State University, USA; Petra Fisser, University of Twente, Netherlands; Ghaida Allayar, Public Authority of Applied

Education and Training, Kuwait; Douglas Agyei, University of Cape Coast, Ghana; Matthew Koehler, Michigan State University, USA; Tae Seob Shin, Michigan State University, USA; Leigh Graves Wolf, Michigan State University, USA; Mike DeSchryver, Michigan State University, USA; Denise Schmidt, Iowa State University, USA; Evrim Baran, Iowa State University, USA

Abstract:
"This symposium reports about research on professional development strategies that prepare pre-service teacher education students from various countries to become TPACK competent. All strategies have in common that they use a design approach to teachers' professional development. Pre-service teachers' performance on a TPACK outcome measure is also reported. The symposium particularly aims to identify characteristics of professional development that contribute to teachers' integration of technology and will also include an update on the development of an assessment instrument designed to measure teachers' development of TPACK."

Raising the Bar for 21st Century Teacher Preparation
Mark Warner, Kennesaw State University, USA; Cherry Steffen, Kennesaw State University, USA; Jim Cope, Kennesaw State University, USA

Abstract:
"As we address the significance of TPACK's power to integrate elementary school curriculum and its ability to increase student's depth of understanding, we also underscore problem based learning (PBL) (Sage, Krynock, &Robb, 2000; Torpe & Sage, 2002; Warner and Leonard, 2004) as a vigorously relevant pedagogy that incorporates quality standards-based curriculum, instruction, and assessment for learners whose individual differences are influenced by such demographics as socio-economic status, home language, and culture. Thus the confluence of TPACK and PBL pedagogy results in an effective model that improves the development of teacher candidates' skills to meet the learning challenges presented by students who are more diverse, technologically savvy, and more media molded than yesterday's learners."

Developing a Game-based Learning Environment in Classrooms: A Conceptual Model
Wen-Hsiung Wu, National Kaohsiung University of Applied Science, Taiwan; Wei-Fan Chen, The Pennsylvania State University, USA

Abstract:
"This study presents a conceptual model for developing a game-based learning environment. This model adopts a role-playing strategy in a digital gaming environment by considering the educational theory of TPCK (Technological Pedagogical Content Knowledge) that integrates pedagogical knowledge, content knowledge, and technological knowledge. The model includes three different modules: (1) input module, (2) developmental process module, and (3) evaluation module from the perspective of input-process-output."

A Case Study of Investigating Preservice Mathematics Teachers' Initial Use of the Next-Generation TI-Nspire Graphing Calculators with Regard to TPACK

Orhan Curaoglu, Middle East Technical University, Turkey; Lingguo Bu, Florida state University, USA; Lydia Dickey, fsu, USA; Hyewon Kim, fsu, USA; Recep Cakir, Amasya university, Turkey

Abstract:
"As many researchers have studied, calculators may not be appropriate for all educational situations or all mathematical subjects. However, Ellington (2003) reported that the improvement to problem solving skills was most significant when (a) special curriculum materials were designed for use with the calculator and (b) the type of calculator used was the graphing calculator. The purpose of the study was to identify strengths and limitations in how prospective mathematics teachers use the graphing calculator in teaching mathematics concepts and procedures. This study included both quantitative and qualitative data collection and analysis methods, providing an opportunity for presenting a greater diversity of views. , discussion thread and essay data were qualitatively analyzed in the context of the TI-Nspire study in search of recurring themes, informed by the Technological Pedagogical Content Knowledge (TPCK) framework (Niess, 2008)."

Using Online Videos in the Science Methods Classroom as Context for Developing Preservice Teachers' Awareness of the TPACK Components

Richard Hechter, University of Manitoba, Canada; Lynette Phyfe, University of Manitoba, Canada

Abstract:
"The interplay between technological knowledge, pedagogical knowledge and science content knowledge (TPACK) is critical to enriching science teaching and learning. The purpose of this study was to determine if preservice teachers could recognize the components of the TPACK framework when a TPACK designed lesson demonstrated this interaction as part of their middle year's science methods course. Preservice middle years teachers (n=57) participated in a two-hour instructional sequence that incorporated YouTube videos as a context for scientific inquiry and science content. Qualitative data collected through reflective journal responses suggested that preservice teachers recognized the three components of the TPACK model in the lesson. Implications from the study provide insight for science educators as they design and implement TPACK in science methods courses."

"Bit by Bit Putting it All Together" How a Holistic View of Assessment Changed Our Perception of the TPACK Framework

Colleen Sexton, Governors State University, USA; Michael Gordon, Governors State University, USA; Kathleen Hickey, Governors State University, USA

Abstract:
“This research calls for a holistic view in assessing teacher candidates. The assessments used throughout the program contribute to the growth of the candidate, but separately don’t complete the picture. The assessments should require a candidate to apply research based best practices, demonstrate conceptual development, reflection and growth. Our Professional Unit refers to this as the candidates’ ability to demonstrate reasoned eclecticism. In the TPACK framework the candidate would pull from pedagogical, content, and technology knowledge to demonstrate their professional growth. The questions asked in this research are: How can we use the individual bits of data each faculty member collects to be more holistic in our quest to create reasoned eclectic practitioners? Will this data affirm our belief that our reasoned eclecticism framework is essentially the same as the TPACK framework?”

Reconsidering the T and C in TPACK: Repurposing Technologies for Interdisciplinary Knowledge
Kristen Kereluik, Michigan State University, USA; Punya Mishra, Michigan State University, USA; Matthew Koehler, Michigan State University, USA

Abstract:
“This paper discusses the TPACK framework and offers a critique of its applicability to address the demands of teaching and learning in the 21st century. We propose a reframing of Content Knowledge (C) to address the increasingly salient role of interdisciplinary knowledge in the changing global job market. We propose a reframing of Technology Knowledge (T) to address changes in education, as well as provide recommendations for fostering necessary skills in teachers, designed to empower teachers to repurpose technology to meet their specific needs. Finally, examples of innovative and successful repurposing are provided and discussed in conjunction with the TPACK framework.”

Advancing K-8 Mathematics and Science Teachers Knowledge for Teaching with Technology through an Online Graduate Program
Margaret Niess, Oregon State University, USA; Henry Gillow-Wiles, Oregon State University, USA

Abstract:
“Teachers in rural areas have limited access to subject specific professional development and advanced degrees. They need ways to prepare for meeting new and emerging challenges requiring knowledge of content, pedagogy, and technologies in order to reflect new ways of thinking about teaching. A new distance education Master's degree program was designed to focus on deepening mathematical and science content knowledge as well as integrating technologies for teaching and learning in these content areas. This descriptive study explores how development of a virtual community of learners and an electronic portfolio guide participants' implementation in their classrooms of the knowledge and skills envisioned in the construct of technological, pedagogical,

and content knowledge (TPACK). Analysis demonstrates ways the community of learners and portfolios provide a valid and reliable avenue for teachers to illustrate their understanding of the interplay among technology, pedagogy, and content."

Testing a TPACK-Based Technology Integration Assessment Rubric
Judi Harris, College of William & Mary, USA; Neal Grandgenett, University of Nebraska at Omaha, USA; Mark Hofer, College of William & Mary, USA

Abstract:
"Although there is ever-increasing emphasis on integrating technology in teaching, there are few well-tested and refined assessments to measure the quality of this integration. The few measures that are available tend to favor constructivist approaches to teaching, and thus do not accurately assess the quality of technology integration across a range of different teaching approaches. We have developed a more "pedagogically inclusive" instrument that reflects key TPACK concepts and that has proven to be both reliable and valid in two successive rounds of testing. The instrument's interrater reliability coefficient (.857) was computed using both Intraclass Correlation and a score agreement (84.1%) procedure. Internal consistency (using Cronbach's Alpha) was .911. Test-retest reliability (score agreement) was 87.0%. Five TPACK experts also confirmed the instrument's construct and face validities. We offer this new rubric to help teacher educators to more accurately assess the quality of technology integration in lesson plans, and suggest exploring its use in project and unit plans."

Aspiring to Reach 21st Century Ideals: Teacher Educators' Experiences in Developing Their TPACK
Mia Kim Williams, University of Northern Colorado, USA; Teresa Foulger, Arizona State University, USA; Keith Wetzel, Arizona State University, USA

Abstract:
"This paper discusses teacher educators' experiences in developing technological, pedagogical and content knowledge through redesigning course content to integrate web 2.0 technologies. Findings suggest that the instructors gained technological knowledge and modified pedagogical practices in order to incorporate the new technologies. The characteristics of participants as adopters of innovations and their developments in TPACK are discussed, which are important considerations for teacher education programs of the 21st Century."

Auditing the TPACK Competence and Confidence of Australian Teachers: The Teaching With ICT Audit Survey (TWictAS)
Peter Albion, University of Southern Queensland, Australia; Romina Jamieson-Proctor, University of Southern Queensland, Australia; Glenn Finger, Griffith University, Australia

Abstract:
“This chapter describes the construction and validation of an instrument to measure teachers’ Technological Pedagogical Content Knowledge (TPACK). The TPACK Confidence Survey (TCS) contains scales that measure teachers’ attitudes toward using ICT; confidence to use ICT for teaching and learning tasks (TPACK); competency with ICT; Technology Knowledge (TK); and TPACK Vocational Self-efficacy. The scale measuring TPACK confidence uses the Learning With ICTs: Measuring ICT Use in the Curriculum instrument that has been evaluated and reported previously. This paper proposes that the TCS provides a valid and reliable instrument with which to audit teachers’ TPACK confidence.”

The Validation of an Instrument Measuring TPACK

Nicolette Burgoyne, Brigham Young University, USA; Charles R. Graham, Brigham Young University, USA; Richard Sudweeks, Brigham Young University, USA

Abstract:
“The TPACK framework is becoming increasingly pervasive in teacher education. Researchers and practitioners have been seeking reliable and valid ways to measure the constructs associated with the TPACK framework. This paper describes the development of an instrument measuring self-efficacy for the constructs in the TPACK framework and has the aim of providing evidence for the validity and reliability of the scores produced from this questionnaire. The paper reports on the results of a confirmatory factor analysis and what evidence the scores provide for construct validity of the TPACK self-efficacy instrument.”

Concerns-Based Conceptual Change: A Theory of Change for Teacher Education

Philip Molebash, Loyola Marymount University, USA

Abstract:
“We can be encouraged by the fact that many of the teachers matriculated through our teacher preparation programs have significantly altered their teaching practice. The important question to ask is what can teacher educators do to ensure that a greater percentage of teachers make the changes we desire? Resting at the core of this investigation is the well-developed theory of conceptual change (Posner, Strike, Hewson & Gertzog, 1982). Given that multimedia and information technologies are central to the conceptual changes that must take place in teachers if they are to effectively teach, the theories pertaining to how individuals adopt technological innovations naturally complements conceptual change theory. The Concerns-Based Adoption Model (Hall, George, & Rutherford, 1977; Hall & Hord, 2001) is particularly useful in this venture. This paper presents the results of previously performed research that led to the development of a theory of change, the Concerns-Based Conceptual Change Model (Molebash, Capps, & Glassett, in press) that unifies conceptual change theory with CBAM.”

Expanding the Practice-Based Taxonomy of Characteristics of TPACK
Kamini Jaipal, Brock University, Faculty of Education, Canada; Candace Figg, Brock University, Canada

Abstract:
"This paper expands a proposed theoretical taxonomy of characteristics of teacher knowledge for planning and implementing technologically-enhanced lessons for elementary instruction across subject matter areas. The expanded taxonomy is derived from a cross case analysis of data from two consecutive studies in which a total of twelve pre-service teachers taught tech-enhanced lessons during a 7-week practice-teaching session. Data sources included a questionnaire, individual interviews, lesson plans, observations of pre-service teachers' classroom practice, and post-lesson debriefings. The taxonomy of characteristics contributes to understandings of the types of knowledge pre-service teachers require for successful teaching with technology."

Taking TPACK to the Classroom: Teacher Candidates Get 'Handy' for Class
Candace Figg, Brock University, Canada; Jenny Burson, LeTourneau University, USA

Abstract:
"This paper describes the development of a textbook containing practice-based information, guided lesson planning activities, and discussions of appropriate technology based on a taxonomy of TPACK characteristics and actions derived from a two-year longitudinal study (Author & Jaipal, 2009), while integrating the research from Harris and Hoffer (2008) regarding activity types and the TPACK framework (Koehler & Mishra, 2008). The textbook is serving as the main resource for teacher candidates in a technology integration methods course as part of a qualitative research project to assess how the explicit teaching of these foundational TPACK characteristics affects teacher candidates' technologically-enhanced teaching practice."

Thursday, April 1

Measuring TPACK in a Preservice Teacher Education Course Utilizing a Blended Model of Instruction
Rob Horgan, Queen's University, Canada

Abstract:
"The purpose of this roundtable is to facilitate discussion and criticism regarding a work-in-progress research project that seeks to develop TPACK in preservice teachers using a blended learning course. A description of the study will be presented as well as any preliminary findings. The results of this study will highlight both instructor and student experiences of participating in a course facilitated utilizing a blended model of instruction, which will benefit teacher education programs seeking to develop TPACK within teacher candidates."

Coding Pre-Service Teacher Lesson Plans for TPACK
Kristen Kereluik, Michigan State University, USA; Greg Casperson, Michigan State University, USA; Mete Akcaoglu, Michigan State University, USA

Abstract:
“Technology is rapidly becoming a predominant force for education, and teachers now more than ever have nearly endless technological tools at their disposal. The specific role of technology in education is not always well understood or utilized to its full potential (Cuban, Kirkpatrick, & Peck, 2001). The Technology Pedagogy Content Knowledge (TPACK) framework attempts to elaborate on the 3 essential types of knowledge required by teachers for successful technology integration (Mishra & Koehler, 2006; Koehler & Mishra, 2008; 2009). The TPACK framework also attempts to illustrate the dynamic and interconnected nature of the three primary components; technology knowledge, pedagogy knowledge, and content knowledge. In this paper, we propose a complementary method of analysis to identify practical and applied elements of TPACK in pre-service teacher lesson plans. We propose this lesson-plan coding scheme not as a replacement for the TPACK survey but rather as a supplement.”

Technological Pedagogical Content Knowledge (TPACK): A Content Analysis of 2006-2009 Print Journal Articles
Mario Kelly, Hunter College, City University of New York, USA

Abstract:
“The study reported here was a content analysis of articles published in print journals since the publication of a seminal article on TPACK (Mishra and Koehler, 2008). Categories across which articles were analyzed included the main focus of each article, how TPACK was defined and measured, and the treatment of validity and reliability of measures, and whether context, the fourth element of the framework was addressed.”

Values, Beliefs, and Perspectives: Teaching Online within the Zone of Possibility Created by Technology
Kathryn Dirkin, CMU, USA; Punya Mishra, MSU, USA

Abstract:
“This study explores the transactional relationship between three professors’ beliefs and values about teaching and learning and the course management system within which their beliefs were manifested. This study used a qualitative design with a multiple case study approach. Although each instructor was using the same course management system they all relied on very different instructional moves to teach the content of their courses. Several key issues emerged highlighting the transactional relationship between teachers and technology. Specifically, the instructors' knowledge of technology, content, and pedagogy created a "zone of possibility" that affected the manifestation of their beliefs and values in an online course.”

Using TPACK as a Model for School Development

Kirsti Engelien, Department of Teacher Education and School Development, University of Oslo, Norway; Kjersti Stundal, Gjerdrum secondary school, Norway

Abstract:
“Using an in-depth case study, we will demonstrate how the TPACK framework was used as a foundation for a school development project. As part of a national strategy program, The Knowledge Promotion – from words to practice, a small primary school developed a large scale project, involving all staff and pupils over a period of two years with the intention of becoming “a digitally competent school”. The school collaborated closely with teacher educators during this project. Based on results from a school evaluation program, TPACK was used as a fundamental strategy for this school development project. This paper elaborates on the different strategies that were implemented to develop teachers’ TPACK. Results from the case study also show that TPACK can be used to highlight the skills of the school principal. These are required to lead the school's ICT implementation, and to relate to a complex, multifaceted and situated practice.”

TPACK as Shared, Distributed Knowledge

Hæge Nore, Akershus University College, Faculty of Technical and Vocational Teacher Education, Norway; Kirsti L. Engelien, University of Oslo, Department of Teacher Education and School Development, Norway; Monica Johannesen, Oslo University College, Faculty of Education and International Studies, Norway

Abstract:
“This article is summing up experiences from five years of Learning Networks established to facilitate the implementation of basic skills in all subjects and on all levels of primary and secondary education in Norway. Among the basic skills is digital literacy. The local schools and their school managers and teachers are expected to be professionals and responsible for interpreting the new curriculums and transform them to local plans, setting focus on content, tasks, working methods and the use of technology. The distributed responsibility for the development of local plans claims a common frame for discussions and interpretations. In this setting TPACK has turned out to b a useful model for understanding practice and management today, for defining competence needs among teachers and school managers and as a strategy tool for school development.”

Technological Pedagogical and Content Knowledge for Music Teachers

William Bauer, Case Western Reserve University, USA

Abstract:
“The purpose of this brief paper and presentation will be to propose and discuss a research-based conceptual framework for pre- and in-service music educators to utilize when integrating technology into music classes and rehearsals.

Technological Pedagogical and Content Knowledge (TPACK) is a model that provides a way to conceptualize how technology can be effectively integrated into teaching and learning. This presentation will engage attendees in consideration of the dynamic relationships among content, pedagogy and technology when contemplating primary music learning outcomes related to creating (composition and improvisation), performing (singing and playing instruments), and responding (knowledge of, listening to) music. Suggestions of ways in which pre- and in-service music teachers can develop TPACK will be provided and the importance of a disposition of "adaptive expertise" will be discussed."

Storytelling as a Strategy for Integrating Technologies into the Curriculum: An Empirical Study with Post-Graduate Teachers

Clara Coutinho, Minho University - Braga - Portugal, Portugal

Abstract:

"Digital Storytelling (DS) is a creative combination of images and sound that allows the production of pedagogical resources with high potential for teaching and learning. Recent research shows that teachers´ familiarity, confidence and skills in integrating technology into the curriculum are dependent on education programs that provide technology-rich experiences throughout all aspects of the training. Aware of this reality and responsible for preparing digitally wise teachers, a DS activity was implemented with a group of post graduate teachers who attended a program on Educational Technology. For one semester teachers studied the theory of visual learning, prepared still images and created digital stories for classroom use. In this paper, we describe the training experience, present and reflect on teachers´ feedback and conclude that DS is a powerful tool to use in the field of technology and teacher education because it allows teachers´ to mobilize their multiples knowledge on curricular contents, pedagogy and technology (TPACK)."

Pre-Service Teacher Technology Integration: The Team-Taught Cohort Model and TPACK

Grace Ward, University of Maine Farmington, USA; Theresa Overall, University of Maine Farmington, USA

Abstract:

"The Team-Taught Cohort Model for pre-service teachers includes a "block" of courses in combination with a field experience in the second year of a four-year university teacher education program. The TPACK framework was formally introduced to the Team-Taught Cohort Model during the second year of the study. Four self-report surveys were administered generating seven measures for each group of students. Effect Sizes measured using Cohen's d ranged from 0.43 to 1.78 across the seven measures for students in the two semesters prior to TPACK and from 0.47 to 2.14 for the two semesters after TPACK was introduced. Results indicate that the Team-Taught Cohort Model is successful in

increasing pre-service teachers' competence and confidence in technology integration in the classroom especially within the TPACK framework."

Friday, April 2

Must Technology Take Place in Mathematics and Science Pedagogy? - What Do Chinese Educators Think?
Kun Shao, Webster University, USA

Abstract:
"With the increasing attention to the importance of instructional technology at all educational levels in the United States, one expects Asian countries, such as China to have a superior classroom instructional structure in technology to support the high achievement in mathematics and science education. In this paper I describe the on-site observations of mathematics and science classrooms in China; first hand data obtained from Chinese educators and students through interviews;and discussions with college faculty members and school teachers on effective pedagogy in conducting mathematics and science curriculum. The findings of this project coincided with outcomes concluded in the other studies and raise the question on the role that technology plays in the achievement of mathematics and science learning."

Observational Measures of Technological, Pedagogical, Content Knowledge (TPACK) in the Integration of Laptop Computers in Elementary Writing Instruction
Julie Mueller, Wilfrid Laurier University, Canada

Abstract:
"Technological Pedagogical Content Knowledge (TPACK) of teachers involved in laptop integration was examined through qualitative analysis of planning meetings, interviews, and instructional observations. Teachers were implementing laptops in writing instruction for junior level (grades 4, 5 and 6) students in six French Immersion and English classrooms. Observational measures of teacher knowledge will add to the growing body of research supporting the need for TPACK in successful technology integration. The TPACK measures will be used in conjunction with individual teacher variables and support variables to test a model of successful integration (Mueller & Wood, 2009)."

Hong Kong Home Economics Teachers' Preparedness for Teaching with Technology
Kitty Ho, University of Southern Queensland, Hong Kong; Peter Albion, University of Southern Queensland, Australia

Abstract:
"In Hong Kong as elsewhere the government has undertaken a series of initiatives to increase the incidence, and effectiveness, of application of

information and communication technology (ICT) in education. This paper reports on a study of ICT adoption by Home Economics teachers in Hong Kong. Although participants reported having access to ICT for classroom use, moderate levels of ICT skills, and positive attitudes to ICT, most reported limited classroom use with that being for traditional didactic lessons. Based on the data, including teacher perceptions of barriers to ICT use and needs for development, TPACK (http://www.tpck.org/) is used to explain the observations and suggest a way forward."

Integrating TI-Nspire Technology into Algebra Classrooms: Selected Factors That Relate to Quality of Instruction
Irina Lyublinskaya, CUNY College of Staten Island, USA; Nelly Tournaki, CUNY College of Staten Island, USA

Abstract:
"TI-Nspire technology, a new generation of graphing calculators, was integrated into high school integrated algebra curriculum. Four teacher-participants were supported through a yearlong professional development emphasizing the use of technology through an inquiry based approach. The data included the teachers' perceptions about TI-Nspire? technology, teachers' proficiency with TI-Nspire? technology, quality of instruction determined through classroom observations, and the frequency of technology use in the classroom based on questionnaire completed by the students. Data analysis indicates that there is a significant positive correlation between quality of instructional practice, quality of use of technology, and teachers' level of TPACK. In general, teachers with better perceptions used technology in the classroom more frequently, were more proficient with the technology, had higher quality of instructions, and higher level of TPACK. Implications on years of experience and pre-service training are discussed."

Student Engagement with the Authoring of Digital Media in Sixth Grade History
Curby Alexander, University of Illinois at Springfield, USA

Abstract:
"In this study, student engagement was studied in the context of authoring digital media that incorporates the use of historical images. The study employed a qualitative and quantitative design involving observations, the collection of student artifacts and interviews. The findings demonstrated that the manner in which engagement was manifested by the students varied based on the type of task they performed (storyboarding versus essay writing), as well as by their interest in the historical content. Engagement with the digital media task was manifested through more time on task, the amount of detail put into the artifact, the presence of a theme and a willingness to go beyond the basic guidelines of the assignment. Applications of these findings and directions for future studies are discussed."

Preparing Foreign Language Teachers to Implement a Technology-Rich Curriculum
JungJin Kang, Michigan State University, USA; Xiaopeng Ni, Michigan State University, USA; Guofang Li, Michigan State University, USA

Abstract:
"Recently, a variety of technology-rich curricula have been implemented in foreign/second language education. However, the literature demonstrates that simply providing technology in the classroom does not guarantee learning outcomes; it is more about how teachers deliver the curriculum and how technology is used. Therefore, developing responsive professional development to transform teachers' understandings and ways of using a technology-rich curriculum has become critical in order to maximize the effects. This paper illustrates our design of a professional development program using TPACK as a conceptual framework. We will also demonstrate the design principles underlying the professional development program to help teachers effectively deliver a technology curriculum."

Examining the Validity of the TPACK Framework From the Ground Up: Viewing Technology Integration Through Teachers' Eyes
M Brooke Robertshaw, Utah State University, USA; Ronald B. Gillam, Utah State University, USA

Abstract:
"One of continuing challenges of the PCK, and now TPACK, framework lies in how to measure teachers' knowledge as characterized by these frameworks. In order to begin to overcome these challenges,one voice that is needed is that of the teachers. How do they describe what they need to know to integrate technology effectively into the classroom and does that description align with how researchers are describing knowledge within the TPACK framework? Using a grounded theory lens, a study was undertaken to examine how teachers' reported beliefs fit within the TPACK framework."

7. Coming up: TPACK at AERA 2010

The annual meeting of the American Educational Research Association is scheduled for April 30 – May 4 in Denver, Colorado. TPACK will be well represented there, with approximately 12 presentations (that we could find) related to the construct. They are:

(Symposia)

Perspectives on TPACK
Chair: Gerald A. Knezek (University of North Texas)
Discussant: Ann D. Thompson (Iowa State University)

• *Exploring the nature of Technological Pedagogical Content Knowledge using Factor Analysis*
Leanna Archambault (Arizona State University), Joshua H. Barnett (Arizona State University)
• *Lost and found in Translation: A TPACK Survey of Mid-Career Teacher Beliefs and Practice*
Lisa G. Hervey (North Carolina State University)
• *Measuring the TPK Component of TPACK: An Alternative to Self-Assessment*
Andrew Frederick Barrett (Indiana University)
• *Knowledge Growth in Teaching Mathematics-Science with Technology: Moving PCK to TPACK in Online Professional Development*
Maggie L. Niess (Oregon State University), Emily H. Van Zee (Oregon State University), Tina L. Johnston (Oregon State University), Henry Gillow-Wiles (Oregon State University)

Innovative Pathways to the Development of Teacher Technological Pedagogical Content Knowledge: Empirical Accounts From Preservice and In-Service Teachers
Chair: Chrystalla Mouza (University of Delaware)
Discussant: Ann Thompson (Iowa State University)

• *Evidence of TPACK in Preservice Graduates' Rationales for Future Technology Use*
Joan E. Hughes (University of Texas-Austin)
• *Preservice Teachers' Technology Integrated Planning: Contrasting Quality and Instructional Variety by Development Approach*
Mark J. Hofer (College of William & Mary), Neal Grandgenett (University of Nebraska-Omaha), Judith B. Harris (College of William & Mary), Karen Work Richardson (College of William & Mary)
• *Using Classroom Artifacts to Judge Teacher Knowledge of Reform-Based Instructional Practices that Integrate Technology in Mathematics and Science Classrooms*
Maggie L. Niess (Oregon State University)
• *Effects of Practice-Based Professional Development on Teacher Learning in Technology Integration*
Chrystalla Mouza (University of Delaware
• *GeoThentic: Designing and Assessing with Technological Pedagogical Content Knowledge*
Aaron Doering (University of Minnesota), Cassandra Scharber (University of Minnesota)

(Individual Papers)

• *Developing TPACK in Mathematics Instruction*
Andrew B. Polly (University of North Carolina-Charlotte)

• *Using TPACK Without Knowing It: Preservice Teachers' Perceptions of Integrating Instructional Technology in Social Studies*
Erik Jon Byker (Michigan State University)

• *The Continuing Development, Validation, and Implementation of a TPACK Assessment for Preservice Teachers*
Denise A. Schmidt (Iowa State University), Evrim Baran (Iowa State University), Ann D. Thompson (Iowa State University), Matthew J. Koehler (Michigan State University), Punya Mishra (Michigan State University), Tae Seob Shin (Michigan State University)

8. TPACK Work in Progress

Bob Isaacson, who works in the Faculty Development Division in the U.S. Army's Defense Language Institute, shared a draft of a paper that he's working on at present with us. It uses TPACK to describe "Training Requirements for Foreign Language Teaching Online." In the paper, Bob concludes, "The TPCK construct can provide a conceptual framework for faculty development specialists to develop training that will enable foreign language teachers to make the transition from traditional face-to-face teaching to online distance teaching using both best pedagogical practices for teaching foreign languages at a distance and existing technology resources and tools." If you would like to communicate with Bob about his work, please email him.

9. New Hybrid Ph.D. Program at Michigan State (Connecting with TPACK)

The idea of TPACK is deeply grounded in practice. Keeping this in mind, and in order the develop the next generation of TPACK-fluent scholars and researchers, the Educational Psychology and Educational Technology program at Michigan State University is now offering a hybrid doctoral program focused on the evolving roles of technology in learning. This cohort-based, blended program (which combines online coursework with intensive summer classes on campus) is designed for bright, established professionals currently working in K-12 schools, universities, policy centers, and research institutions who want to earn a Ph.D. while continuing in their current positions. *The goal is to bring together a cohort of practitioners, using the powerful collaborative tools we now have, to create, explore and share; to engage in dialogue and dissent; to critique and conduct research; and to experiment with new technologies, new pedagogies and new content.* To find out more about this program please click on the following links:

The official program Web site:
- http://edtechphd.com/

A few other Web sites/ blog posts that describe the program in greater detail:
- http://tinyurl.com/edtechphd1

- http://tinyurl.com/edtechphd2
- http://tinyurl.com/msutechphd

10. 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
- Join and contribute to the TPACK Google group at: http://groups.google.com/group/tpack/
- Review and provide feedback on 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

If you are interested in volunteering to help run the newsletter (we need help!), send email 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, Matt, Mario, and Punya

Judi Harris, Chair, College of William & Mary
Matt Koehler, Vice-Chair, Michigan State University
Mario Kelly, Futon, Hunter College
Punya Mishra, Recliner, Michigan State University