

Editorial: What we learned about Technology and Teacher Education in 2017

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As part of our three-step effort to increase communication between the *Journal of Technology and Teacher Education* and its authors (Chenowith & Ferdig, 2016), we end each year by publishing an editorial that essentially acts as a year-in-review. This editorial examines the work that was published in 2017 within volume 25 of JTATE. In volume 26, issue 2, we will be publishing more quantitative data on acceptance rates, total number of submissions, etc. (see Ferdig & Chenowith, 2017). The purpose of this editorial, however, is to be more qualitative in nature—attempting to synthesize what we learned about the study of technology and teacher education from our author contributions. By summarizing, we are also attempting to describe the trajectory of research in the field of technology and teacher education. As always, we encourage readers to read the details of each article.

Looking back at 2017

A total of sixteen papers were refined and recommended for publication through our double-blind, peer-review process. We also invited an additional paper on teacher educator technology competencies. Broadly speaking, the articles published in *JTATE* during 2017 examined four topics: 1) integration, intentions, and adoption; 2) professional development/learning; 3) TPACK; 4) and virtual tools for practice and mentoring. Each topic is examined here with a brief summary of each of the seventeen articles.

Topic 1: Integration, Adoption, and Intentions

- *Faculty interest influences decisions to include or exclude maker principles and technologies in programs of teacher education* (Cohen, 2017). Cohen's (2017) study aimed to a) uncover the degree to which teacher education programs incorporate maker principles and technologies in their coursework, and b) assess the reasons why these principles are included or excluded. Approximately half of the 123 programs surveyed incorporated some teaching about maker technologies, however, only 12.7% (n= 14) had a course solely dedicated to this topic. Cohen found that faculty interest and lack of funding were the primary factors influencing decisions to include or exclude maker principles and technologies in teacher education programs.
- *Attitude, subjective norm, and perceived behavioral control are important factors influencing preservice teachers' behavioral intentions to use Web 2.0 technologies in their future practice* (Amundson, 2017). Using the Decomposed Theory of Planned Behavior (DTPB), Amundson (2017) proposes a best-fit model for predicting PSTs' behavioral intentions to adopt Web 2.0 technologies in their future professional practice. She found that when preservice teachers believe Web 2.0 technologies to be compatible with collaboration, they are likely to intend to use them. Additionally, she found peer influence, not superior (faculty) influence to be a strong predictor of intended use. Finally, she demonstrates that the presence of devices PSTs can use to access Web 2.0 technologies positively influences their self-confidence in using them, resulting in a higher intention of use. Amundson (2017) recommends that teacher education coursework focus on the purposes of collaboration and compatibility of Web 2.0 platforms, instead of how to use them.

- *Using Twitter in teacher education classes can help teacher candidates envision its potential professional uses in the classroom. There are both challenges and benefits to using Twitter in teacher education classes* (Krutka, Nowell, & Whitlock, 2017). Krutka, Nowell, and Whitlock (2017) aimed to understand both instructors' and students' perceptions of Twitter as well as teacher candidates' perceived uses for social media in their future professional practice. Interestingly, they found that teacher candidates reported technical and organizational shortcomings of using Twitter for a college course. Additionally, some participants (n=20) had limited professional visions for using Twitter in the classroom. About a quarter of the participants (n = 18) reported differences in the faculty's expectations for Twitter uses in the classroom and students' expectations. Successes of using Twitter included building stronger relationships with peers, better understanding of the course content, and more opportunity for students to participate. Eighty percent of the participants indicated they were more likely to use Twitter in teaching after having experienced its use in an educational setting.

Topic 2: Professional Learning/Development

- *Professional development can increase teachers' adoption of technology to support content-area instruction* (Gonczi, Maeng, & Bell, 2017). This paper bridges topic one (intensions) and two (professional learning) of the twenty-fifth volume. It examines the potential influence of professional learning on adoption of technology. Gonczi, Maeng, and Bell (2017) studied elementary science teachers' use of computer simulation in the classroom before and after participating in professional development based on Innovation Adoption Theory. They demonstrated a 35% increase in the number teachers who used computer simulation post- professional development. Their results also suggest that the professional development increased teachers' confidence in using the simulations. Obstacles for adoption included a lack of access to devices, and insufficient instructional time and materials.

- *Hospital teachers' professional learning needs are technological, pedagogical, and personal* (McCarthy, Maor, & McConney, 2017). McCarthy, Maor, and McConney (2017) examined the unique setting of hospital schools and their teachers. More specifically, they explored teachers' professional learning needs regarding mobile technology integration within this teaching context. Through a mixed method design, the authors showed that hospital teachers' professional learning needs were technological, pedagogical, and personal in nature. Teachers cited access, time, confidence as obstacles to using mobile technologies in hospital schools. This paper brings attention to the technology-related professional needs of hospital teachers, but also speaks more broadly to the challenges teachers of children in hospitals encounter such as the misalignment of the hospital school's needs and the hospital's technology policies.
- *Blended professional learning can help mathematics teachers develop their content knowledge and teaching strategies* (Luebeck, Roscoe, Cobbs, Diemert, and Scott, 2017). In this paper, the authors describe a blended professional development program for K-12 mathematics teachers. Teachers participated in online modules as well as face-to-face sessions over four years. Findings show that the blended professional development helped teachers strengthened their content knowledge, helped them utilize quality materials, learn to navigate and understand CCSS, and aided in fostering positive communication with colleagues.
- *Online induction programs can help teachers reflect on their practice* (Ellis, Polizzi, Roehrig, & Rushton, 2017). This study examines the Teacher Induction Network, an online induction program for beginning secondary mathematics and science teachers. This professional network aimed to support teachers professionally and socially but also challenged them to take on a leadership role. This online learning support for beginning teachers aided in building reflective professional communities.

- *Twitter can both restrict or extend professionalism of preservice teachers* (Gomez & Journell, 2017). Gomez and Journell (2017) explored the restricted and extended professionalism affordances of Twitter for professional learning. Their participants, middle school social studies preservice teachers tended to use microblogging for narrowly focused professionalism involved in everyday instruction rather than deeper theoretical questions about pedagogy. However, preservice teachers also engaged in weekly social studies chats (#ss-chat) which helped them engaged in more extended professional conversations about social studies instruction. They also report on some of the logistical challenges of using Twitter in teacher education. The authors encourage teacher educators to consider ways in which Twitter can be used for extended professionalism.
- *Teacher educator technology competencies are a potentially important step towards supporting prospective teachers' technology use* (Foulger, Graziano, Schmidt-Crawford, & Slykhuis, 2017). Foulger, Graziano, Schmidt-Crawford, and Slykhuis (2017) worked collaboratively to develop twelve competencies (attitudes, skills, and knowledge) teacher educators need to support prospective teachers' understanding and use of instructional technology. These competencies include practices such as modeling technology, using content-specific technologies, using technology to differentiate instruction, and engaging in socially-responsible uses.

Topic 3: TPACK Framework

- *TPACK is a useful framework for assessing technological knowledge in teachers' digital portfolios* (Koehler, Greenhalgh, Rosenberg, & Keenan, 2017). In this article, the authors aimed to show how the TPACK framework can be used to assess teachers' understandings of TK, TCK, TPK, and TPCK as represented in students' portfolios. This content analysis revealed that masters' students had strong TK and moderate levels of TCK, TPK, and TPCK. The researchers caution, however, that using TPACK as a lens for evaluating teachers' knowledge requires that the portfolios contain rich artifacts, meaning ones that specifically and deeply examine the intersection of technology, pedagogy, and content knowledge.

- *The ongoing faculty TPACK development model supports building confidence and knowledge, and promotes instructional risk taking* (Mourlam, 2017). Using a mixed methods approach, Mourlam (2017) examined TPACK professional development experiences of teacher educators. This study attends to the gap in the research literature TPACK development for faculty in teacher education programs. Faculty found the ongoing and recursive nature of the professional development to be effective. Of importance was also the facilitator's support, specifically being available to faculty and willingness to problem-solve. Thus, faculty gained confidence and were more willing to take risks in their teaching. Teacher candidates also benefitted from the TPACK development; students' beliefs about their TPACK knowledge increased on all TPACK domains.
- *A mentor teacher's TPACK and frequency of using technology in the classroom potentially impacts preservice teachers' intentions to integrate technology in future practice* (Nelson, 2017). Nelson (2017) examines how a mentor teacher's TPACK and use of technology influences preservice teachers' intentions to use technology in future instructional practice. As preservice teachers observed frequent use of technology, they expressed more intentions to integrate it in their own practice. The mentor teacher's TPACK also had a positive effect on teachers' intentions. These effects were not found to be mediated by usefulness and ease of use.

Topic 4: Virtual tools for practice and mentoring

- *Virtual role-play provides a means for teacher candidates' to practice responding to bullying situations* (Schussler, Frank, Lee, & Mahfouz, 2017). This paper explored the use of a virtual role-play (VPR) tool to support teacher candidate's responses to classroom bullying. This tool, a programmed chatbot name Eli, was a medium through which teacher candidate's engaged in practice conversations about bullying. In comparing candidates who practiced conversations using virtual role-play and those who practiced traditional role-play, the authors found the VPR candidates relied less on their notes, maintained better eye-contact, and adhered more closely to some aspects of the communication protocol learned in class. They found the repeated practice afforded by the VPR helped improve candidates' fluency when responding to bullying.

- *Teacher candidates perceive virtual coaching as an effective means to receive immediate, non-invasive and real-time corrective feedback on instructional practice* (Wake, Dailey, Cotabish, & Benson, 2017). This study examined teacher candidates' perceptions of and concerns about using Skype and a bug-in-ear bluetooth device, providing live corrective feedback. Overall, participants found virtual coaching to be an effective way to receive feedback during their teaching internships and had positive dispositions toward virtual coaching experiences. Some candidates believed they could have received more live feedback during their teaching.
- *Simulations provide a means by which preservice teachers can practice interacting with parents* (Accardo & Xin, 2017). Accardo & Xin (2017) investigated the use of a simulation to assist in preservice teachers' interactions with parental avatars. This technology can be useful for transcending confidentiality regulations and for providing preservice teachers with meaningful practice facilitating parent-teacher conferences and making teaching decisions. Teacher candidates' self-assessments revealed significant differences between control and intervention groups in favor of using simulations for parental collaboration.
- *A virtual coaching partnership model between teacher and principal candidates is feasible* (Stapleton, Tschida, & Cuthrell, 2017). This paper explores the use of virtual coaching software, GoReact, to support and connect principal candidates and teacher candidates. The authors investigated candidates' perceptions and reflections on the virtual coaching partnership model. Eighty percent of teacher candidates found the experience benefitted their instructional practice and found the feedback useful. Ninety-four percent of principal candidates believed the teaching videos aided their coaching practice. Overall, both teacher and principal candidates viewed the experience positively and felt it supported their coaching and instructional practice.
- *Videos and animations can be an effective alternative to live observations when conducting lesson study* (Skultety, Gonzalez, & Vargas, 2017). Skultety, Gonzalez, and Vargas (2017) explored the use of videos and animations to support teachers' attention to student thinking in a lesson study. Unlike prior studies which found these means to be limiting, this article shows that the use of videos and animations in lesson study can help improve teachers' attention to student thinking.

Themes across articles

The research of the twenty-fifth volume attends not only to these topics, but several themes can be derived from the discussions and implications of these papers. Even in 2017, access to technology (individual devices and resources) and funding continues to be an issue for teachers (Amundson, 2017; Cohen, 2017; Gonczi, Maeng, & Bell, 2017; McCarthy, Maor, & McConney, 2017). These calls for access underscore the fact that though technologies can support instructional practice, they are not ubiquitously available.

Our authors this year also highlighted how teacher education faculty and mentor teachers' expectations, attitudes, and competencies support, facilitate, or at times, resist teacher candidates' use and integration of technology (Amundson, 2017; Cohen, 2017; Foulger, Graziano, Schmidt-Crawford, & Slykhuis, 2017; Krutka, Nowell, & Whitlock, 2017; Luebeck, Roscoe, Cobbs, Diemert, & Scott, 2017; Mourlam, 2017; Nelson, 2017). Teacher educators continue to play a critical role in the development of preservice and inservice teachers' adoption and instructional integration. Thus, research on instructional technology professional learning for mentor teachers and teacher education faculty continues to be an area in need of more studies.

This year's volume clearly continues to examine the affordances of various digital tools, artifacts, and social media platforms (Accardo & Xin, 2017; Amundson, 2017; Gomez & Journell, 2017; Gonczi, Maeng, & Bell, 2017; Koehler, Greenhalgh, Rosenberg, & Keenan, 2017; Krutka, Nowell, & Whitlock, 2017; Schussler, Frank, Lee, & Mahfouz, 2017; Stapleton, Tschida, & Cuthrell, 2017; Wake, Dailey, Cotabish, & Benson, 2017). Virtual coaching and simulations have emerged as positive experiences for teacher candidates, providing a means for timely and targeted feedback. These studies focus primarily on participants' perceptions of these tools and experiences. Future studies may explore their long-term effectiveness on teaching practice.

Finally, those authors who examined professional development explored how technology facilitated learning of teachers, teacher and principal candidates, and teacher education faculty. (Ellis, Polizzi, Roehrig, & Rush-ton, 2017; Foulger, Graziano, Schmidt-Crawford, & Slykhuis, 2017; Gonczi, Maeng, & Bell, 2017; Luebeck, Roscoe, Cobbs, Diemert, & Scott, 2017; McCarthy, Maor, & McConney, 2017; Mourlam, 2017; Skultety, Gonzalez, & Vargas, 2017). These studies underscore the importance of professional learning for *all educators* and that it is ongoing from the preservice level through higher education.

Looking ahead to 2018

The articles published in the twenty-fifth volume certainly do not represent the variety of papers we received. We continue to look forward to the new and innovative strategies and tool that will be examined for their current and potential impact on teacher education. There are two special issues planned for 2018. The first relates to “technological supports for practice-based teacher education”; the second examines “teacher preparation and professional development in computing education.” In addition these, there are a number of questions (in our field or in our articles) that have been asked that deserve attention. For instance:

- How do we measure the effectiveness of tools? More specifically, we have evidence of the potential positive outcomes of using simulations and virtual environments, but what factors are most suitable for examination (e.g. feedback, teaching skills, etc.)?
- Innovative tools ranging from drones to virtual reality continue to become cheaper and more affordable. Many have called for their use in education; these calls often result in article submissions on preparing teachers to use them. What about their actual use in teacher preparation?
- Many articles, as presented here, still underscore the availability of new tools (even with their increased affordability). How do we balance the scales both in terms of teacher preparation programs as well as professional development when they enter in schools with varying levels of technology implementation?
- McCarthy, Maor, and McConney (2017) remind us that alternative educational settings are generally understudied in teacher education literature. The intersection of these settings and technology continues to be an area in need of more research. These studies help us understand how technology can be useful beyond the traditional classroom.
- Foulger et al. (2017) introduced the concept of teacher educator technology competencies. As outlined in their article, there are a number of questions about research and practice that will be important to ask and answer in 2018.

In conclusion, we would like to thank our editorial review board for their commitment to providing reviews for all our submissions this year. We appreciate their willingness to give critical and meaningful feedback to all papers being considered for publication. Thank you also to our authors for submitting your work to the *Journal of Technology and Teacher Education*. We are looking forward to reading your work in 2018!

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