

Exploring Essential Conditions: A Commentary on Bull et al. (2008)

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The editorial by Bull et al. (2008) on connections between informal and formal learning made explicit one element of solving what Koehler and Mishra (2008) termed a "wicked problem." This wicked (complex, ill-structured) problem involves working with teachers for effective integration of technology in support of student learning. The technology, pedagogy, and content knowledge (TPACK) model suggests that some individuals may have expertise in technology, some may have expertise in pedagogy, and some may have content area knowledge, yet real success can be anticipated only at the convergence of all three areas of expertise (Bull et al., in press).

Bull et al.'s editorial reminds us of the importance of sociocultural context in implementing any instructional approach or professional development model—a context that should connect to and, where possible, take advantage of innovative technologies, including "emergent social media and communications technologies." The editorial prompted our own discussion of K-12 and preservice programs that had already connected informal and formal learning, and it challenged us to consider some essential conditions for supporting classroom applications of Web 2.0 technologies.

Connecting Informal and Formal Learning at the K-12 Level: The Digital Youth Network

One example of an innovative media literacy program is the University of Chicago Urban Education Institute's (UEI) Digital Youth Network (DYN). UEI's Director of Innovation, Nichole Pinkard, leads a team of real-life artists responsible for helping University of Chicago Charter School students develop technical and analytical skills. The result of their efforts is the production of powerful and authentic media experiences in which students learn to be prosumers (producers and consumers) of media. This program is conducted through both a mandatory media arts class and an afterschool program.

Students and mentor artists also communicate and critique media projects in Remix World, a private social network developed using Ning (<http://www.iremix.org/>).

Students' participation in DYN bolsters the University of Chicago Charter School's one-to-one laptop program and the technology integration efforts of its teachers. Because students become adept at technically producing multimedia as part of an afterschool program (informal learning), classroom teachers can focus on the content and collaborative process involved with project-based assignments that include multimedia formats (formal learning).

UEI's approach corresponds to Roblyer and Bennett's (2001) call for visual literacy instruction that emphasizes both decoding and encoding information; their forward-thinking article acknowledged that visual media would be "generated using sophisticated computer graphics and other software" (p. 14) and affirmed the importance of equitable access and skill-development for females and minorities in the use of such technology-based tools. Likewise Jenkins (2006) and Gee (2008) affirmed that "students need adults to help them learn to leverage technological 'know-how' to learn content, produce knowledge, and develop high-level expertise" (p. 2).

Connecting Informal and Formal Learning in Preservice Teacher Education at Arizona State University (Phoenix)

In their work with preservice teachers, Foulger, Williams, and Wetzel (2008) at the Arizona State University (Phoenix) examined a model built around communal constructivism, taking advantage of existing knowledge and collaborative investigation to model methods for learning about how to integrate new technologies in K-12 classrooms. Concerned about the proliferation of new tools, these teacher educators developed an "Innovations Mini-Teach" approach, where teams of preservice teachers learned about a variety of tools (e.g., wikis, blogs, Smartboards, and podcasting) with and for their peers. Out-of-class collaborative exploration (informal learning) led to resource postings to a class wiki and in-class demonstrations of innovations (formal learning).

Analysis of data gathered through focus groups suggested that preservice teacher participants began to change "how they viewed themselves as learners of technology," (p. 18), with a deeper understanding that "collaboration enhanced their learning opportunities" (p. 13). The intent is that modeling how to learn about new technologies in a preservice teacher education course will transfer to future collaborative work with their in-service peers to learn about and integrate innovative technologies when these students are hired as classroom teachers. In addition, Fougler, Williams, and Wetzel modeled teacher-student collaboration as they facilitated preservice teacher interest and shared learning as the operative instructional strategy, characterizing what Brown and Adler (2008) termed as "Learning 2.0" within a frame of reflection, inquiry, collaboration, and sharing (Pierson & Borthwick, 2008).

Differences Between Formal and Nonformal Learning

Bull et al. (2008) concluded that "the informal learning that occurs in the context of participatory media offers significant opportunities for increased engagement in formal learning settings" (p. 4). The TPACK model, then, provides a framework with which to implement participatory media (technology) for engagement (pedagogy) to achieve specific content-area objectives (content). However, we have much to ponder as we consider differences between formal and nonformal learning. Eshach (2007) identified three types of learning: formal learning (often school-based), nonformal learning (such as

on a field trip to a museum) and other informal learning (spontaneous learning during everyday living). His comparison of formal and nonformal learning provides insight into pedagogical differences. Although both are usually prearranged and structured, formal learning is usually sequential and compulsory and involves extrinsic motivation and evaluation of learning. Nonformal learning typically is voluntary, involves intrinsic motivation, and is not evaluated. The examples from the Digital Youth Network and Arizona State University demonstrate an instructional approach that intentionally connects learning from a nonformal setting in support of learning in a formal setting.

The Need for a Supportive Context

Bull et al. (2008) listed six factors currently limiting the effective use of social media within schools, including the need to achieve content area objectives within limited time, access to Web 2.0 tools, classroom management, and research-based models for best practice. In looking at how K-12 formal education settings are adopting participatory media technologies, we found that many were in an awareness or information stage. The administration and some teachers have participated in workshops and have an acquaintance with Web 2.0 terms like *blog* or *wiki*. Some may be using these technologies, but only as way of disseminating information rather than enabling participation and collaborative development of a shared site.

The full transition of these tools from informal to formal settings will be difficult for several reasons. First, school personnel often make conservative decisions and feel safe about technology use with products developed by large companies. These vendors can provide effective training, setup, and product support. Large companies can also ensure security of data and often the privacy of individuals. This practice presents a problem because many Web 2.0 products are open source or come from small start-up companies.

Second, school districts need to show a direct connection between any new initiatives and their school improvement goals. Web 2.0 technologies are in their infancy and lack the research base necessary to make this connection. Thus, a Web 2.0 initiative might be a teacher's small side project, but will not be adopted as typical teacher practice or endorsed as best practice by district-level leaders (e.g., an assistant superintendent for curriculum or technology director). A third hurdle may be the hierarchical structure of decision making within a school district. Embracing Web 2.0 initiatives requires a more democratic mindset and a trust in collaborative decision making.

Differences in student roles in informal and formal learning settings and their expertise with new technologies present both a challenge and an opportunity. The introduction of Web 2.0 tools in the classroom enables an expanded role for students. McAnear (2008) suggested that with the introduction of Web 2.0 tools "learning has come to be viewed as a social activity" (p. 5), and Bull et al. (2008) reminded us of the student-centered nature of informal learning. However, Eshach (2007) suggested that approaches to nonformal learning are usually supportive, while the approach to formal learning may be perceived as repressive.

Fourteen years ago, Dixon (1994), in his call for "Future Schools," discussed an already outdated model of childhood in which children were viewed as passive rather than as capable, self-directed, and assertive individuals. Encouraging students to take a leadership role in technology-supported teaching and learning may also require teachers to rely on a different type of student than they have in the past. The National School Boards Association report on *Research and Guidelines on Online Social—and Educational—Networking* (2007) discussed, at some length, the cutting edge knowledge

of nonconformist students who may not typically perform well academically. Nonconformists “seem to have an extraordinary set of traditional and 21st century skills, including communication, creativity, collaboration and leadership skills and technology proficiency” (p. 4).

Teacher educators face fewer of these constraints. They work with adult students, can *explore* the use of new technologies in a particular course rather than *adopt* new tools for college-wide use, and generally operate within a realm of academic freedom. Perhaps more important in higher education are constraints such as resources for technology and faculty development, a culture of collaborative learning, sustained leadership at multiple levels (Cohen, Pelligrino, Schmidt, & Schultz, 2007) and incentives (International Society for Technology in Education [ISTE], 2008; Vannatta & O’Bannon, 2002). The same may be true for educators working in nonformal settings, such as museums and afterschool, grant-supported programs.

Even if teacher educators or other professional developers are able to successfully model an approach that connects informal learning with formal learning, transfer to K-12 settings may be hindered by the contextual constraints previously described. If teacher educators and preservice teachers are *exploring* the use of participatory media projects, then what conditions need to be present for them to *adopt* similar projects when they are classroom teachers working in formal learning settings?

Essential Conditions for Integrating Web 2.0 and Other New Technologies in the Classroom

We reviewed the Essential Conditions identified by ISTE as part of the *National Educational Technology Standards (NETS) for Students* (ISTE, 2007) and *NETS for Teachers* (ISTE, 2008), finding key phrases, such as “digital-age learning,” “emerging technologies,” and “professional learning plans and opportunities with dedicated time to practice and share ideas” (ISTE, 2007, 2008). To “effectively leverage technology for learning,” the ISTE Essential Conditions point to a “shared vision” with “proactive leadership” and a “systemic plan” for implementation. Once again, we looked for examples, noting that those we found reflected strong administrative interest and support.

At the Science Leadership Academy in Philadelphia, former technology coordinator and principal Chris Lehmann leads the way in supporting effective technology practices. According to Lehmann (2008), new digital tools “allow all of us — students and teachers — to do five things better than we’ve ever been able to do them in our classes before: Research, Collaborate, Create, Present and Network.” When asked about ways he supports the use of new technologies, Lehmann emphasized giving teachers time to learn and play—through a weeklong summer gathering, weekly faculty workshops, common preparation time for teachers during the school day, and support for risk taking.

In another example, Homer (Illinois) Consolidated School District 33c Superintendent Michael Morrow, along with Assistant Superintendent for Instruction Dana Rzepka and several other key district stakeholders, developed a vision for participatory media projects in the classroom and established a proactive Web 2.0 pilot program for their district. With strong administrative support and a small budget, Andy Dole, Technology Teacher at Hadley Middle School, has set out to learn about and develop appropriate uses for podcasting, vodcasting, and digital movie projects (A. Dole, personal communication, July 20, 2008).

These two examples call attention to the important role administrators play in the adoption of Web 2.0 technologies in formal learning settings. The use of participatory media is occurring on a limited basis and may be better supported following reexamination of practices, structures, and policy under the control of school leaders (National School Boards Association, 2007). While the ISTE Essential Conditions envision “stakeholders at every level empowered to be leaders in effecting change” (2008, p. 3), school and district adoption of new technologies requires administrative approval and support.

Conclusion

In closing, we find the TPACK model to be a strong framework for examining the “wicked problem” of technology integration. Whether the new technologies being integrated in the classroom involve dynamic media, social networking, programming as a key literacy of the future (Prensky, 2008), or video games (Jenkins, 2006), teachers remain committed to achieving content-related objectives within limited timeframes. As evidenced in the Digital Youth Network and Arizona State University examples, connecting nonformal and formal learning experiences requires thoughtful coordination and design of instruction. However, adopting the pedagogical approaches of nonformal learning along with emerging technologies in formal learning settings may present a challenge for some teachers and teacher educators.

A pedagogical approach that allows students to be more self-directed and takes advantage of their prior knowledge and skills in the use of new technologies requires a supportive school context and a teaching and administrative staff willing to address critical media literacy and to work together in a context of inquiry and reflection. Jenkins (2006) encouraged us to address three concerns as we “think about meaningful pedagogical intervention” (p. 8), including how to ensure (a) student access to skills and experiences as well as new technologies, (b) socialization of students into the ethics of participatory communication, and (c) students’ ability to examine critically “how media shapes perceptions of the world” (p. 9). Each of these goals holds implications for instructional objectives, strategies, and assessment in shaping a student’s role as media maker.

Conditions for supporting design of classroom application of Web 2.0 technologies and connecting informal and formal learning include a context that supports the identification of appropriate uses, risk-taking by teachers, and development of collaborative wisdom. Leadership by administrators and other stakeholders in establishing a supportive context and school culture is essential. Based on their summary of multiple models of professional development in educational technology, Pierson and Borthwick (2008) concluded that the TPACK framework should be implemented in a context of reflection, inquiry, collaboration, and sharing.

Bull et al. (2008) affirmed the need for research-based models of best practice, and Dawson, Cavanaugh, and Ritzhaupt (2008) offered one promising way to accumulate results of preservice and in-service teacher inquiry through the use of an online database—Action Research for Technology Integration (ARTI)—hosted by the University of Florida. Whether through the use of ARTI or other data collection and dissemination systems, we need to track “patterns of performance, which leads to improved learning outcomes for students” (Dawson et al., p. 9).

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