The History of TPACK

1999-Present (2010)

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TPACK

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What is TPACK?

- A way of thinking about what teachers need to know about technology

- Short for *technological pedagogical content knowledge* (TPACK).
Ancient History (1999-2000)

- Traditionally, if you want to teachers to use technology ...
  - Teach them technology skills (assuming this is the barrier to their use of technology)
  - Hold a few workshops or training seminars, and teach them to make web-pages, use Microsoft Word, maybe iMovie, etc.
  - Assume that armed w/ this knowledge, they will put it to good educational use in the classroom.
Ancient History (1999-2000)

• In 1999 or 2000 Matt met Punya (and vice versa), and had a few conversations about this idea
  • We agreed that this approach doesn’t really work
  • And roughly, had an idea why (ie., learning skills out of context)
  • And we both favored a more hands on approach / learning by doing approach / learning in context approach
Ancient History (1999-2000)

• So we began a few “design experiments” (Brown, 1992; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Design Based Research Collective, 2003).

• Our teaching of ed tech masters students (and college faculty) became oriented around an approach that we called learning technology by design
  • People would learn about educational technology by designing educational technology

• We have been developing theory; developing teachers; and developing a curricular approach (learning technology by design).
Learning Technology by
Ancient History (1999-2000)

• Learning Technology design projects included:
  • Designing online courses that would be taught in the college of education (ed tech students and college faculty working in groups)
  • Designing a website or powerpoint to teach ______
• We thought the advantages were:
  • Collaboration allowed for sharing expertise
  • Learning about technology was always contextualized
  • Rich opportunities to learn about multiple technologies in one single design project
  • Engaging learning environment
History (2002)

- We collected data to see what people were learning:
  - Surveys
  - The artifacts that teams were designing
  - Transcripts of what people talked about
  - Copies of writings and emails
  - Interviews
History (2002)

• We were sure that it was working

• But... why? It surely had something to do about the learning technology in context, but what does that mean? What is the educational technology context anyway?

• We were struck by an very good description of teacher knowledge by Shulman (1986).
History (2002)

- Shulman argued that to date, there are roughly two things that scholars had identified that teachers need to know:
  - Content knowledge: Expertise about the topic they were teaching
  - Pedagogical knowledge: Knowledge about teaching techniques, assessment, etc.

- But what was missing was:
  - Pedagogical Content Knowledge: Knowledge about how to teach a particular subject matter, knowing about common student trajectories (and misconceptions), and ways to assess that knowledge for a particular subject matter

- This idea by Shulman is widely accepted (and cited) now by everyone
History (2002)

- We thought that when you threw technology into the mix, that traditional workshop approaches that teach technology in isolation were doing:

  C ——— P

  T
History (2002)

• Instead, we thought learning technology in context meant learning this:

- C: Content
- P: Pedagogy
- T: Technology
- R: Representations

Why?
Diagrammatic representations

- The tetrahedral model...
Diagrammatic representations

• The tetrahedral model…
History (2002)

- Ultimately, R (Representations) went away from our way of thinking:
  - Representations are usually one of the three categories: representations afforded by technology, representations of content or pedagogy (e.g., a formula to represent math or physics ideas)
  - Shulman often wrote about representations for a subject matter to be part of pedagogical content knowledge
  - It was really hard to code for
  - It wasn’t doing much for it

- Which leads us to 2003 and the present
Theoretical Framework

• The current framework has three, interconnected components
  • CONTENT
  • PEDAGOGY
  • TECHNOLOGY
An intermediate step
Still with lines… but with no way to represent TPCK

(First publication of the TPACK figure, then TPCK, 2004)
An intermediate step

Able to talk about connections between:

• Content and Technology
• Pedagogy and Technology
• Content and Pedagogy

*Nobody really noticed*
A More modern Representation

- These three components, each represent knowledge bases that ideally overlap.

Published in 2005

This was a year-long fight too! (What do overlaps mean? Subsets or different/new knowledge?)
A More modern Representation

Published in 2005

Nobody Notices
A More modern Representation

• All previous written TPCK work summarized and reformulated as a “framework” for tech integration

Published in 2006

Another year long fight

“Everybody” notices
• In our framework, there are multiple things that teachers need to know
  • *Content (C)* – The subject matter of what they are teaching
  • *Pedagogy (P)* – The methods of teaching
  • *Technology (T)* – Tools, software, and hardware (commonplace technologies like blackboards, as well as digital computers)
Theoretical Framework

- But not just the three in isolation, but their intersection as well
  - **Pedagogical Content Knowledge (PC)** – How to teach a particular subject matter, common student understandings and misconceptions, etc. (Shulman, 1986, 1987)
  - **Technological Content Knowledge (TC)** – how a subject matter is transformed by the application of technology
  - **Technological Pedagogical Knowledge (TP)** – how technology can support pedagogical goals (e.g., fostering collaboration).
Theoretical Framework

• But not just the three in isolation, but their intersection as well
  • Technological Pedagogical Content Knowledge (TPC) – understanding and negotiating the relationships between these three components of knowledge (Bruce & Levin, 1997; Dewey & Bentley, 1949; Rosenblatt, 1978)
  • Similar to ideas presented by Hughes, in press; Keating & Evans, 2001; Lundeberg, Bergland, Klyczek, & Hoffman, 2003; Margerum-Leys, & Marx, 2002
Current Representation (2008)

• TPCK gets its outer ring

Published in 2008
TPCK becomes TPACK (2007)

- Everyone can pronounce it now

EDITORS’ REMARKS
Ann D. Thompson
Punya Mishra

Breaking News: TPCK Becomes TPACK!

For those of us interested in the construct Technological Pedagogical Content Knowledge and the clarity it brings to our work with preservice and inservice teachers, the acronym TPCK has been somewhat problematic. The consonant heavy, TPCK is difficult to say and even getting the letters in the correct order is a challenge for most of us. It is not surprising, thus, that both undergraduate students and inservice teachers tend to be put off when confronted with this unfriendly set of consonants. We have found ourselves apologizing every time we introduce the idea because it does tend to suggest the type of educational jargon for which we educators have received much (justifiable) criticism. TPCK is actually a simple, yet powerful idea and the complicated name and acronym does disservice to its utility and power.

Published in 2008
Conclusions

- TPACK, and its representation, did not come easily.
- Changes over the years were iterative.
- Small changes in representation resulted in big changes in how TPACK resonated with other researchers.
- Talking about it in terms of explaining design teams is different than talking about it as a framework.