SAMR and TPCK:
Intro to Advanced Practice

Ruben R. PuenteDura, Ph.D.
The SAMR Model
Substitution
Tech acts as a direct tool substitute, with no functional change

Augmentation
Tech acts as a direct tool substitute, with functional improvement

Modification
Tech allows for significant task redesign

Redefinition
Tech allows for the creation of new tasks, previously inconceivable

Enhancement

Transformation

Podcasts on iTunes U: http://tinyurl.com/aswemayteach
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The TPCK Model
TPCK + SAMR As Process
Advanced Strategies
Three Key Curricular Areas

• The Connected Approach to Learning
  • Connections between subject areas
  • Connections within subject areas

• Asking how we know what we know
  • Ways of knowing in the humanities, arts, sciences, and mathematics
  • Nonsense detection filters

• Integrating theoretical domains with applied practice
  • Micro theory into macro observation
  • Macro theories into micro observation
Connections Between Subject Areas
Example: Analytic Narrative
Connections Between Subject Areas
Example: the Social Sciences
Connections Within Subject Areas
Example: Visual Arts
Connections Within Subject Areas
Example: Literature

• “What binds the authors together in an intellectual community is the great conversation in which they are engaged. In the works that come later in the sequence of years, we find authors listening to what their predecessors have had to say about this idea or that, this topic or that. They not only harken to the thought of their predecessors, they also respond to it by commenting on it in a variety of ways.”

Mortimer Adler, “The Great Conversation Revisited”
Ways of Knowing
Example: the Process of Science
# Ways of Knowing

## Example: Making Sense of Historical Evidence

### Making Sense of Documents

- **Making Sense of Oral History**
  - Written by Linda Shopes, this guide presents an overview of oral history and ways historians use it, tips on what questions to ask when reading... [more]

- **Making Sense of Films**
  - Written by Tom Gunning, this guide offers an overview of early twentieth-century film and how historians use it, tips on what questions to ask when... [more]

- **Making Sense of Maps**
  - This guide offers an overview of the history of maps and how historians use them, a breakdown of the elements of a map, tips on what questions to ask... [more]

- **Making Sense of Numbers**
  - Written by Gary J. O’Hara and his wife, this guide offers an overview of quantitative methods, how historians use historical data, and step-by-step... [more]

- **Making Sense of Letters and Diaries**
  - This guide offers an overview of letters and diaries as historical sources and how historians use them, tips on what questions to ask when reading... [more]

- **Making Sense of Advertisements**
  - Written by Daniel Pepe, offers an overview of advertisements as historical sources and how historians use them, a brief history of... [more]

- **Making Sense of American Popular Song**
  - Written by Ronald G. Walters and John Spizer, Making Sense of American Popular Song provides a place for students and teachers to begin working with... [more]

- **Making Sense of Documentary Photography**
  - In this guide, James Curtis helps students and teachers understand the documentary images that often illustrate textbooks but are almost never... [more]

### Scholars in Action

- **Analyzing an 1804 Inventory**
  - In this interview Barbara Clark Smith discusses strategies for analyzing household possessions, specifically a 1804 inventory of the possessions of... [more]

- **Analyzing Political Cartoons**
  - In this interview, Michael O’Malley discusses strategies for interpreting political cartoons, specifically an 1876 Thomas Nast cartoon. The cartoon... [more]

- **Analyzing Blues Songs**
  - In this interview, Lawrence Levine discusses strategies for listening to and interpreting music, specifically two blues songs, “Two White Horses”... [more]

- **Analyzing Photographs**
  - In this interview, Frank Goodyear discusses strategies for interpreting a 1853 photograph of Niagara Falls taken by Platt Babbitt. The daguerreotype... [more]

- **Analyzing Letters**
  - In this interview, Teresa Murphy discusses strategies for reading letters, specifically three 19th-century letters written by labor activists... [more]

- **Analyzing Abolitionist Speeches**
  - In this interview, Carla Peterson discusses strategies for interpreting speeches, specifically abolitionist speeches. These two speeches, one by... [more]

- **Analyzing a Melville Story**
  - In this interview Hans Bergmann discusses strategies for interpreting literature, specifically a short story by Herman Melville published in 1853... [more]

- **Analyzing a Colonial Newspaper**
  - This interview with Barbara Clark Smith discusses strategies for interpreting colonial period newspaper coverage, specifically a 1775 article about a... [more]
Nonsense Detection Filters
Example: Dashboards, Radars, Filters

Mindful Infotention

- Requires
  - Infotention Filters
    - Are one kind of
      - Tool for Thought
        - Which includes
          - Cognitive
          - Social
          - Technological
    - Are necessary to create and use
      - Attention literacies
        - Are read and controlled through
          - include
            - Intelligence dashboards
              - Are constructed from
                - Smart RSS readers
          - Are viewed through
            - Info Filters
              - Create dynamic
                - Yahoo pipes
              - Use
                - Further filtered, sorted with
                  - Feeds from Postrak, other services
        - make use of
          - News Radars
            - Are built from
              - filtered for quality through
                - RSS feeds
                  - From
                    - News searches
                    - Persistent searches
                    - Blogs
                    - Delicious tags
                    - Flickr, Youtube tags
Rhetorical testosterone and analytical hallucinations
July 1, 2010 @ 9:01 am · Filed by Mark Liberman under Language and politics

In her most recent column ("Obama: Our first female president", 7/1/2010), Kathleen Parker argues that Barack Obama writes like a girl:

If Bill Clinton was our first black President, as Toni Morrison once proclaimed, then Barack Obama may be our first woman President. […]

No, I’m not calling Obama a girly President. But … he may be suffering a rhetorical-testosterone deficit when it comes to dealing with crises […]

What’s her evidence for this lack of "rhetorical-testosterone"? Along with a lot of vague stuff about how Obama is "a chatterbox" who shares with "Ronald Reagan and Bill Clinton" (!) the ability to "assume feminine communication styles effectively", the column includes exactly one relevant fact:

Obama’s [oil spill] speech featured 13 percent passive-voice constructions, the highest level measured in any major presidential address this century, according to the Global Language Monitor, which tracks and analyzes language.

If you’re not a regular reader, please take a few minutes to scan our last discussion of linguistic "analysis" from Paul Payack’s Global Language Monitor ("Language guru runs with the journalistic pack", 6/17/2010). According to Mr. Payack, president Obama’s address on the gulf oil spill was excessively "professorial" because its average sentence length was 19.8 words. I checked on president George W. Bush’ post-Katrina speech, and found that its average sentence length was 23.5 words, suggesting either that Bush was even more "professorial" than Obama, or that Mr. Payack was full of it.

So what about those passives?

The first thing to say is that there isn’t the slightest evidence that passive-voice constructions are "feminine". Women don’t use the passive voice more than men, and among male writers, number of passive-voice constructions doesn’t appear to have any relationship at all to real or perceived manliness. The "passive is girly" prejudice seems to be purely due to the connotations of (other senses of the term passive, misinterpreted by people who in any case mostly wouldn’t recognize the
Integrating Theory and Practice
Example: Pure Math/Applied Math
Multirelational organization of large-scale social networks in an online world

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The capacity to collect fingerprints of individuals in online media has revolutionized the way researchers explore human society. Social systems can be seen as a nonlinear superposition of a multitude of complex social networks, where nodes represent individuals and links capture a variety of different social relations. Much emphasis has been put on the network topology of social interactions, however, the multidimensional nature of these interactions has largely been ignored, mostly because of lack of data. Here, for the first time, we analyze a complete, multirelational, large social network of a society consisting of the 300,000 odd players of a massive multiplayer online game. We extract networks of six different types of one-to-one interactions between the players. Three of them carry a positive connotation (friendship, communication, trade), three a negative (enmity, armed aggression, punishment). We first analyze these types of networks as separate entities and find that negative interactions differ from positive interactions by their lower reciprocity, weaker clustering, and fatter-tail degree distribution. We then explore how the interdependence of different network types determines the organization of the social system. In particular, we study correlations and overlap between different types of links and demonstrate the tendency of individuals to play different roles in different networks. As a demonstration of the power of the approach, we present the first empirical large-scale verification of the long-standing structural balance theory, by focusing on the specific multiplex network of friendship and enmity relations.

complex networks | multiplex relations | quantitative sociology

Human societies can be regarded as large numbers of locally interacting agents, connected by a broad range of social and economic relationships. These relational ties are highly diverse in nature and can represent, e.g., the feeling a person has for another (friendship, enmity, love), communication, exchange of goods (trade), or behavioral interactions (cooperation or punishment). Each type of relation spans a social network of its own. A systemic understanding of a whole society can only be achieved by understanding these individual networks and how they influence and coconstruct each other. The shape of one network influences the topologies of the others, as networks of one type may act as a constraint, an inhibitor, or a catalyst on networks of another type. The existence of different link types between agents explains the overlap of community structures observed in social networks, where nodes may belong to several communities, each associated to one different type of interaction (5, 6). Methodological work on multiplex networks includes the development of multiplex community detection (7), clustering (8), and other network analysis algorithms (9). The role of multiple relation types in measured social networks has recently been investigated across communication media (10), in an online game (11), as well as in ecological networks (12).

Traditional methods of social science, such as small-scale questionnaire-based approaches, get more and more replaced by automated methods of data collection which allow for entirely different scales of analysis (13–15). This change of scale has opened new perspectives and has the potential to radically transform our understanding of social dynamics and organization (16). The empirical verification of social theories such as the strength of weak ties (17, 18) become possible with hitherto unthinkable levels of precision. However, this large-scale perspective suffers from the drawback of a relatively coarse-grained representation.

Fig. 1. Multiplex networks consist of a fixed set of nodes connected by different types of links. This multirelational aspect is usually neglected in the analysis of large social networks. In our MMOG dataset, six types of social links can exist between any two players, representing their friendship or enmity relations, their exchanged private messages, their trading activity, their one-to-one aggressive acts against each other (attacks), and their placing of head money (bounties) on other players as, e.g., means of punishment. In the organization of large-scale networks, for example, the existence of different link types between agents explains the overlap of community structures observed in social networks, where nodes may belong to several communities, each associated to one different type of interaction (5, 6). Methodological work on multiplex networks includes the development of multiplex community detection (7), clustering (8), and other network analysis algorithms (9). The role of multiple relation types in measured social networks has recently been investigated across communication media (10), in an online game (11), as well as in ecological networks (12). Traditional methods of social science, such as small-scale questionnaire-based approaches, get more and more replaced by automated methods of data collection which allow for entirely different scales of analysis (13–15). This change of scale has opened new perspectives and has the potential to radically transform our understanding of social dynamics and organization (16). The empirical verification of social theories such as the strength of weak ties (17, 18) become possible with hitherto unthinkable levels of precision. However, this large-scale perspective suffers from the drawback of a relatively coarse-grained representation.
Resources Cited
• The SAMR Model:

• The TPCK Model:
  - *TPCK - Technological Pedagogical Content Knowledge*

• TPCK + SAMR:

• SAMR Examples:
  - *The Tragedy of Macbeth (text hosted at MIT)*
    http://shakespeare.mit.edu/macbeth/index.html
  - *Flickr Shakespeare Group*
    http://www.flickr.com/groups/shakespeare/
  - *Many Eyes*
    http://manyeyes.alphaworks.ibm.com/manyeyes/
  - *UpStage*
    http://upstage.org.nz/blog/?page_id=2
  - *Macbeth Island Flythrough*
    http://www.youtube.com/watch?v=8QNxe2gePEQ
  - *Avogadro*
    http://avogadro.openmolecules.net/wiki/Main_Page
  - *GAMESS*
    http://www.msg.chem.iastate.edu/gamess/
  - *MacMolPlt*
    http://www.scl.ameslab.gov/~brett/MacMolPlt/
• PK Examples:
    http://www.nap.edu/openbook.php?record_id=6160
  • *Education Resources Information Center*
    http://www.eric.ed.gov/

• CK Examples:
  • *Science Daily*
    http://www.sciencedaily.com/
  • *Institute of Historical Research - Reviews in History*
    http://www.history.ac.uk/reviews/

• PCK Examples:
  • *National Council of Teachers of Mathematics - Lessons and Resources*
    http://www.nctm.org/resources/default.aspx?id=230
  • *Center for Applied Linguistics - CALdigests*
    http://www.cal.org/resources/digest/index.html

• TK Examples:
  • *Apple iLife Support*
    http://www.apple.com/support/ilife/
  • *EDUCAUSE Learning Initiative - 7 Things You Should Know About…*
    http://www.educause.edu/7495&bhcp=1
• **TPK Examples:**
  - *The Sloan Consortium - Effective Practices*
    http://www.sloanconsortium.org/effective/
  - *Education & Information Technology Library*
    http://www.editlib.org/

• **TCK Examples:**
  - *Harvard-Smithsonian Center for Astrophysics - MicroObservatory*
    http://mo-www.cfa.harvard.edu/MicroObservatory/
  - *VisualComplexity*
    http://www.visualcomplexity.com/vc/

• **TPCK Examples:**
  - Prof. Wyn Kelley: *MIT OpenCourseWare - 21L.003 Introduction to Fiction*
    http://ocw.mit.edu/OcwWeb/Literature/21L-003Fall2003/CourseHome/index.htm
  - Prof. Oded Meyer: *Carnegie Mellon Open Learning Initiative - Introduction to Statistics*
    https://oli.web.cmu.edu/jcourse/webui/guest/look.do?section=stats-excel
  - Prof. Edward L. Ayers: *Virginia Center for Digital History at the University of Virginia - The Rise and Fall of the Slave South*
    http://www.vcdh.virginia.edu/HIUS323/
  - Prof. Jon Beasley-Murray: *University of British Columbia - Murder, Madness, and Mayhem: Latin American Literature in Translation*
• Advanced Strategies:
  • Ruben R. Puentedura, *Rethinking Visualization: From Dynamic Illustration to Online Narrative*. (2010) Online at:
    http://hippasus.com/resources/swarthmore2010/1_RethinkingVisualization.pdf
    http://www.eigenfactor.org/map/maps.htm
  • Alfred Barr, *Cubism and Abstract Art*. (1936) Online at:
  • *Understanding Science*. (2009-2010) Online at:
    http://undsci.berkeley.edu/
    http://historymatters.gmu.edu/browse/makesense/
  • Howard Rheingold, “Mindful Infotention: Dashboards, Radars, Filters”. *City Brights: Howard Rheingold*. (September 1, 2009) Online at:
  • Mark Liberman, “Rhetorical testosterone and analytical hallucinations”. *Language Log*. (July 1, 2010) Online at:
    http://languagelog.ldc.upenn.edu/nll/?p=2422
  • *Wolfram|Alpha*: http://www.wolframalpha.com/
  • Justine Whitman, “Moon Motion and Tides”. *Aerospaceweb.org Q&A*. (19 February 2006). Online at:
    http://www.aerospaceweb.org/question/astonomy/q0262.shtml
  • Michael Szell, Renaud Lambiotte, and Stefan Thurner, “Multirelational organization of large-scale social networks in an online world”. *PNAS*. (July 19, 2010) Online at:
    http://www.pnas.org/content/early/2010/07/13/1004008107.full.pdf