Using Threshold Concepts as a Means for Transformative Teaching: Experiences from an Undergraduate IS Course

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Agenda

- Introducing Threshold Concepts at our school
- Need for Threshold Concepts in Info. Systems
- Searching for Threshold Concepts
- Implementation
- Conclusions
Introduction of Threshold Concepts

- October 15, 2015 (Teaching Enhancement Workshop on Threshold Concepts)
  - Dr. Julie Timmermans from University of Waterloo,
    Michael Potter, CTL Lorie Stolarchuk, Allyson Skene and
    Erika Kustra, CTL

- November 8, 2015 (Threshold Concepts in Required Courses)
  - Dr. Maureen Gowing
Need for Threshold Concepts in IS

What is the appropriate course title?

- Management Information Systems
- Managing Information Systems
- Business Information Systems
- Information Systems Management
- IT and Organizations
- IT, People and Organization
- Information Technology in Business
What do students say?

- I hope to learn some programming because there are lot of jobs in this field.
- I hate coding. I hope I won’t be bored in this class.
- Is it similar to Organization Behavior (OB) class?
- Do you teach Excel? My friends got jobs because of Excel and Access.
- Why is it not called Information Technology class?
- Do I need strong math background to excel in this class? I am kind of worried because I am not good at math and computer.
Need for Threshold Concepts in IS
Need for Threshold Concepts in IS

- Identity crisis in Information Systems discipline
    - Research concern in IS
    - under-investigating phenomena intimately associated with IT-based systems
    - and over-investigating phenomena distantly associated with IT-based systems
Need for Threshold Concepts in IS

- Identity crisis in Information Systems discipline
    - Will lead to micro focus
    - Potentially dangerous for the field
    - Elimination of IS from academic programs
    - Propose alternative heuristics
    - Emphasize transformational aspect of IT (Macro focus)
    - With deep knowledge of underlying artifact
Need for Threshold Concepts in IS

- Identity crisis in Information Systems discipline
  - IT and Organizations
  - IS Development
  - IT and Individuals
  - IT and Markets
  - IT and Groups
  - Conclusion: Relatively stable research identity
Need for Threshold Concepts in IS

- All papers are about IS research
  - The conclusion was that IT TRANSFORMS
    - Organization
    - Individuals
    - People and Society

- How about TEACHING?
Searching for Threshold Concepts in IS

Features of Threshold Concepts

- **Transformative** - Once understood, a threshold concept changes the way in which the student views the discipline
- Troublesome
- Irreversible
- Integrative
- Bounded
- Reconstitutive
- Discursive
- Liminal
Searching for Threshold Concepts in IS

Classical Hierarchy

✓ Data
✓ Information
✓ Knowledge
✓ Wisdom

"Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?"

T.S. Eliot (The Rock)
### Levels of understanding of IS Concepts (Cope & Prosser, 2005)

<table>
<thead>
<tr>
<th>Level</th>
<th>Meaning</th>
</tr>
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<tbody>
<tr>
<td><strong>6</strong></td>
<td>A number of communicating information systems within a single organisation</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>A computerised data manipulation system and people gathering data, disseminating information and communicating to support a single organisational function.</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>A computerised data manipulation system supporting many people within a single organisational function.</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>A data manipulation system supporting an individual within a single organisational function</td>
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<tr>
<td><strong>2</strong></td>
<td>A simple information retrieval system.</td>
</tr>
<tr>
<td><strong>1</strong></td>
<td>A personal search of a static information source</td>
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</tbody>
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Eureka! The Threshold Concept in IS

Information Technology

Transforms

Organizations.
The Threshold Concept in IS

Social determinism

Information Technology (Database, Programming, Web, Social media, Analytics, Open Source, Cloud Computing)

TRANSFORMS
Cognition + Affect + Action
(changes, enables, improves, makes it difficult, helps to innovate, disrupts, helps in decision making, complicates, simplifies...)

Organizations (as well as Individuals, Society, and Nations influencing economic, culture, and politics)

Psychology, judgement and decision making

Deep transformational knowledge of IT artifact

Unit of application

Technological determinism
Implementation

Winter 2016, 2 Sections

- Same chapters covered as before
- Lecture method and focus changed
- Lab focus changed
- Learning objectives and assignments changed
- Evaluation emphasis changed
Focus on IT (Transformational aspect)

- What is so TRANSFORMATIONAL about a particular technology?
- Dynamics of Open Source Software development
- Data analytics -> Visualization & architecture
- How does social media transform? Collaboration, peer production, network effects.
Nature of Transformation

- Invention? Innovation?
- Disruption?
- Failure?
- Challenges? Privacy & security?
- Change management?
- Adoption/resistance?
Unit of application

- Organization (small, medium, large)
- Individuals and society (demographics, culture)
- Nation (Culture, economy, politics, governance)
Overarching pedagogical philosophy

Weaving of Information Technologies, Organization, and People to bring about transformations.
Outcomes

- Lectures are better organized and integrated
- More leeway in creating assignments/tests (fewer MCQs)
- Consistent theme across all seemingly disparate chapters and lab exercises
- Synthesized resources (video, cases, data)
- Easy to frame and structure case studies
- Better student attendance and engagement
- Informal feedback (Positive)
Key take-aways

- Threshold concept is not necessarily about content always
- Granularity, focus, and reinforcement are also critical
- In my case:
  - Threshold = Transformative = Integrated
  - Synthesis = Threshold (Video)
- It is discipline specific (Micro → Macro)
References