Women in Technology
Sharing Online (WitsOn):
Assessing Usage, Satisfaction, and Outcomes from an E-Mentoring Course

Julia Nelson Savoy
Presentation Goals

- Study overview
  - Introduction
  - WitsOn program description
  - Research objectives
  - Theoretical framework
  - Research methods
  - Findings
  - Discussion

- Questions and comments
Introduction

- Mentoring in research
  - Mentoring research is plentiful (Crisp & Cruz, 2009; Haggard, Dougherty, Tuban, & Wilbanks, 2011; Jacobi, 1991)
  - Varying definitions of mentors, mentoring (Anderson, 2005)
  - Multiple functions of mentoring (Jacobi, 1991; Kram, 1985; Nora & Crisp, 2008)
  - Important foundation work for studying impact and positive outcomes

- Mentoring in practice
  - Formal or informal programs in a variety of settings (Henry, Bruland, & Sano-Franchini, 2011)
  - Intentionally or randomly assigned pairs (dyads)
  - Research or project-based interactions
Introduction

- Growth of (electronic) e-mentoring
  - Expanded mentoring offerings with comparable success to face-to-face programs (Haggard, Dougherty, Tuban, & Wilbanks, 2011; Leck, Elliott, & Rockwell, 2012)
  - Distinct advantages (Bierema & Hill, 2005)
  - Unique challenges and limitations (Cozza, 2011)

- Mentoring for women students in STEMM
  - Research evidence suggests alternative formats to expand access and opportunity (Leck, Elliott, & Rockwell, 2012)
  - Several dyadic e-mentoring programs have shown successful outcomes (e.g., MentorNet, 2013; Single, 2005)
WitsOn program description

- Collective, connectivist e-mentoring MOOC
  - Fall 2012: 6-week, self-directed massive online open course
  - Offered nationally; over 70 institutions participated
  - Instructors served as mentors and discussion moderators
  - Weekly “lead mentor” videos from highly successful leaders in industry and academia (WitsOn, 2012)

- Program goals
  - Connect female undergraduate STEMM students with many successful mentors
  - Help students envision themselves in STEMM careers
  - Encourage student action toward career goals
  - Motivate students to seek out offline mentoring (Lewin, 2012; WitsOn, 2012)
Research objectives

Study purposes

- Assess WitsOn as a tool to support retention and persistence over time
- Evaluate program goal achievement
- Gather user feedback for future programming

Achieved by investigating

- Participants and their characteristics
- Amount and type of Witson engagement
- Satisfaction with WitsOn
- Career decision-making expectations and beliefs
- Outcomes attributed to WitsOn participation
Theoretical framework

- Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994).
  - Central concept is self-efficacy (Bandura, 1986, 1997)
  - Analysis includes contextual factors like barriers and supports, personal characteristics
  - Self-efficacy expectations influence career choice, performance, persistence (Hansen & Pedersen, 2012)

- Interpreting the WitsOn experience through SCCT
  - Mentoring can provide two of the four sources of self-efficacy (Bandura, 1997; Concannon & Barrow, 2010)
  - Women may form self-efficacy expectations differently than men, through these same self-efficacy sources (Zeldin & Pajares, 2000; Zeldin, Britner, & Pajares, 2008)
Research methods

- **Participants**
  - 65 WitsOn participants from one participating institution

- **Instrumentation**
  - Two-part online self-administered survey
  - Part I assessed usage, satisfaction, outcomes
  - Part II asked about characteristics, career decision-making beliefs
    - Demographic information
    - Likelihood of persisting in major
    - Career decision-making self-efficacy expectations
    - Anticipation and perception of career barriers
Research methods

- Data collection and analysis
  - 5 week collection period (pre-notice, invite, 3 reminders)
  - Descriptive statistics of numerical data
  - Content analysis for open-ended items (Mayring, 2000)
Results: Participants

- **Response rates and demographic characteristics**
  - 17 of 65 responded (26%)
  - All female undergraduates from variety of STEMM fields
  - 92.3% Caucasian or White, 7.7% Asian
  - None were Hispanic or Latina

- **Past, present, and planned academic programs**
  - None were first-generation college students
  - Most had not changed schools or majors while enrolled
  - Very unlikely to change majors, transfer to another school, or drop out
    - Only two would change majors
    - Only one would transfer to another school
Results: Participants

- Long-term (ten year) career goals
  - Program completion, including advanced degrees
  - Begun a career
  - Engage in further career decision-making

Table 1: Respondents’ long-term career and academic goals

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree completion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Master’s degree</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Medical or doctoral degree</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Begun a career</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have found a job in industry</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Have found a job in academia</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Have found a job in my field (unspecified)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Further career decision-making</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make choices about moving to or remaining in industry or academia</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Have achieved satisfaction with career choice</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Results: WitsOn Usage

- Respondents spent less than one hour per week
  - 52.9% 0-20 minutes
  - 29.4% 21-40 minutes
  - 17.6% 41-60 minutes

- Most logged on for about half or more of the course
  - 58.8% logged on 2-3 weeks
  - 23.5% logged on 4-5 weeks
Results: WitsOn Usage

- Respondents spent the most time reading
  - Self-reported contribution to content was relatively low
  - Most likely to respond to posts of instructors, then peers
  - Least likely to initiate their own new thread

Table 2: Respondents’ contribution to content in WitsOn

<table>
<thead>
<tr>
<th>How often did you...</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>...post a new discussion thread?</td>
<td>76.5% (13)</td>
<td>17.6% (3)</td>
<td>5.9% (1)</td>
<td>0.0% (0)</td>
</tr>
<tr>
<td>...receive a response from a peer to your posts?</td>
<td>82.4% (14)</td>
<td>5.9% (1)</td>
<td>0.0% (0)</td>
<td>11.8% (2)</td>
</tr>
<tr>
<td>...receive a response from an instructor to your posts?</td>
<td>76.5% (13)</td>
<td>5.9% (1)</td>
<td>11.8% (2)</td>
<td>5.9% (1)</td>
</tr>
<tr>
<td>...respond to posts initiated by student peers?</td>
<td>64.7% (11)</td>
<td>11.8% (2)</td>
<td>23.5% (4)</td>
<td>0.0% (0)</td>
</tr>
<tr>
<td>...respond to an instructor's note, post, or biography?</td>
<td>52.9% (9)</td>
<td>23.5% (4)</td>
<td>17.6% (3)</td>
<td>5.9% (1)</td>
</tr>
</tbody>
</table>
Results: Satisfaction with WitsOn

- Respondents were satisfied with their experience
  - 71.4% would continue to participate if given the opportunity
  - 71.4% felt it was worth the time they spent
  - 38.5% recommended to a friend/peer during the course
  - 64.2% would recommend to a friend/peer in the future

- Most beneficial aspects of the experience
  - Reading mentor biographies
    - Positive examples of success, overcoming barriers
    - Career pathway examples
    - Specific advice on balancing work-life responsibilities
  - Interactivity in the online community
  - Self-directed nature of the course
Results: Satisfaction with WitsOn

- Satisfaction with specific elements
  - Most satisfied with instructor interaction and overall experience
  - Least satisfied with lead mentor and peer interaction

Table 3: Respondents’ satisfaction with WitsOn

<table>
<thead>
<tr>
<th></th>
<th>Not at all 1</th>
<th>A little 2</th>
<th>Somewhat 3</th>
<th>Very 4</th>
<th>Extremely 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>...the peer interaction you experienced in WitsOn?</td>
<td>16.7% (2)</td>
<td>0.0% (0)</td>
<td>50.0% (6)</td>
<td>8.3% (1)</td>
<td>8.3% (1)</td>
</tr>
<tr>
<td>...the instructor interaction you experienced in WitsOn?</td>
<td>8.3% (1)</td>
<td>8.3% (1)</td>
<td>25.0% (3)</td>
<td>41.7% (5)</td>
<td>8.3% (1)</td>
</tr>
<tr>
<td>...the lead mentor interaction you experienced in WitsOn?</td>
<td>16.7% (2)</td>
<td>8.3% (1)</td>
<td>41.7% (5)</td>
<td>16.7% (2)</td>
<td>8.3% (1)</td>
</tr>
<tr>
<td>...your overall WitsOn experience?</td>
<td>8.3% (1)</td>
<td>8.3% (1)</td>
<td>58.3% (7)</td>
<td>25.0% (3)</td>
<td>0.0% (0)</td>
</tr>
</tbody>
</table>
Results: Career Decision-Making

- Moderate to high career decision-making self-efficacy
  - Used the Career Decision-Making Self-Efficacy-Short Form (Betz, Klein, & Taylor, 1996)
  - Most confident in goal selection and planning tasks
  - Least confident in self-appraisal tasks

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-appraisal</td>
<td>6.84</td>
<td>1.98</td>
</tr>
<tr>
<td>Gathering occupational information</td>
<td>6.92</td>
<td>1.90</td>
</tr>
<tr>
<td>Goal selection</td>
<td>7.18</td>
<td>1.90</td>
</tr>
<tr>
<td>Planning</td>
<td>7.00</td>
<td>1.93</td>
</tr>
<tr>
<td>Problem solving</td>
<td>6.92</td>
<td>1.98</td>
</tr>
</tbody>
</table>
Results: Career Decision-Making

- Low to moderate expectation, perception of career barriers
  - Used the Career Barriers Inventory (Swanson & Tokar, 1991)
  - Expected to encounter barriers in balancing work-life, finding a job
  - Expected these to most likely hinder career progress

Table 5: Expectations and perceptions of career barriers

<table>
<thead>
<tr>
<th>Category</th>
<th>Likelihood of encountering barrier</th>
<th>Extent of career progress hindrance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Choice of career</td>
<td>1.91</td>
<td>1.75</td>
</tr>
<tr>
<td>Finding a job</td>
<td>2.64</td>
<td>1.69</td>
</tr>
<tr>
<td>Job performance</td>
<td>1.83</td>
<td>1.45</td>
</tr>
<tr>
<td>Balancing a job with other life aspects</td>
<td>3.00</td>
<td>1.92</td>
</tr>
</tbody>
</table>
Results: WitsOn Outcomes

- Respondents reported an increase in each area
  - Reported the most impact on interest in pursuing goals, confidence in ability to set goals, motivation to achieve them

Table 6: Outcomes attributed to WitsOn experience

<table>
<thead>
<tr>
<th>To what extent do you feel your WitsOn experience has changed...</th>
<th>Strongly/somewhat decreased</th>
<th>Neither increased, decreased</th>
<th>Strongly/somewhat increased</th>
</tr>
</thead>
<tbody>
<tr>
<td>...your confidence in your ability to set your ten-year goals?</td>
<td>0.0% (0)</td>
<td>42.9% (6)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>...your confidence in your ability to achieve your ten-year goals?</td>
<td>0.0% (0)</td>
<td>57.1% (8)</td>
<td>42.8% (6)</td>
</tr>
<tr>
<td>...your interest in pursuing your ten-year goals?</td>
<td>0.0% (0)</td>
<td>35.7% (5)</td>
<td>64.3% (9)</td>
</tr>
<tr>
<td>...your motivation to pursue your ten-year goals?</td>
<td>0.0% (0)</td>
<td>42.9% (6)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>...the likelihood that you will achieve your ten-year goals?</td>
<td>7.1% (1)</td>
<td>64.3% (9)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>...your interest in participating in another e-mentoring program?</td>
<td>23.1% (3)</td>
<td>38.5% (5)</td>
<td>38.5% (5)</td>
</tr>
<tr>
<td>...your interest in participating in a face-to-face mentoring program?</td>
<td>7.1% (1)</td>
<td>42.9% (6)</td>
<td>50.0% (7)</td>
</tr>
</tbody>
</table>
Results: Program Feedback

- Nearly half (47.1%) felt using WitsOn was easy
  - Overwhelmed by the number of threads
  - Desired more precise search results relatable to personal experience

- Suggestions for future iterations
  - Ability to review threads in specific disciplines
  - Wider variety of mentor-instructors, representing more disciplines
  - Ability to identify students in similar disciplines
Discussion

- Limitations
  - No comparative results (pre-post, to entire participant group, or to a comparable control group)
  - Self-reported outcomes only
  - Low response rate
  - Limited diversity among response group
Discussion

- **Program goal achievements**
  - Students were likely to persist in STEMM
  - Participants attributed positive outcomes aligned with program goals
  - Despite relatively low active contributions and time invested, students reported impact from the activity

- **Theoretical interpretation**
  - Respondents valued the stories of mentors’ experiences
  - Results consistent with other SCCT research

- **Research implications**
  - Several avenues for improved, broader research design
  - Continued need to assess impact for underrepresented groups


References


Thank you!