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

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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

Category	Frequency	Frequency
Degree completion	Bachelor's degree	3
	Master's degree	1
	Medical or doctoral degree	8
Begun a career	Have found a job in industry	1
	Have found a job in academia	2
	Have found a job in my field (unspecified)	5
Further career decision-making	Make choices about moving to or remaining in industry or academia	1
	Have achieved satisfaction with career choice	2

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

How often did you…	Never	Rarely	Sometimes	Often
...post a new discussion thread?	76.5% (13)	17.6% (3)	5.9% (1)	0.0% (0)
...receive a response from a peer to your posts?	82.4% (14)	5.9% (1)	0.0% (0)	11.8% (2)
...receive a response from an instructor to your posts?	76.5% (13)	5.9% (1)	11.8% (2)	5.9% (1)
...respond to posts initiated by student peers?	64.7% (11)	11.8% (2)	23.5% (4)	0.0% (0)
...respond to an instructor's note, post, or biography?	52.9% (9)	23.5% (4)	17.6% (3)	5.9% (1)

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

	Not at all 1	A little 2	Some-what 3	Very 4	Extremely 5
...the peer interaction you experienced in WitsOn?	16.7% (2)	0.0% (0)	50.0% (6)	8.3% (1)	8.3% (1)
...the instructor interaction you experienced in WitsOn?	8.3% (1)	8.3% (1)	25.0% (3)	41.7% (5)	8.3% (1)
...the lead mentor interaction you experienced in WitsOn?	16.7% (2)	8.3% (1)	41.7% (5)	16.7% (2)	8.3% (1)
...your overall WitsOn experience?	8.3% (1)	8.3% (1)	58.3% (7)	25.0% (3)	0.0% (0)

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 4: Career decision-making self-efficacy domains

Category	Mean	SD
Self-appraisal	6.84	1.98
Gathering occupational information	6.92	1.90
Goal selection	7.18	1.90
Planning	7.00	1.93
Problem solving	6.92	1.98

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

Category	Likelihood of encountering barrier		Extent of career progress hindrance	
	Mean	SD	Mean	SD
Choice of career	1.91	1.75	2.22	2.01
Finding a job	2.64	1.69	2.77	1.89
Job performance	1.83	1.45	2.28	2.00
Balancing a job with other life aspects	3.00	1.92	2.50	1.90

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

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

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

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Thank you!