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Research Participants Discuss STEM Conference Participation and Impact on Thinking and Practice

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Research Participants Discuss STEM Conference Participation and Impact on Thinking and Practice

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University System of Georgia
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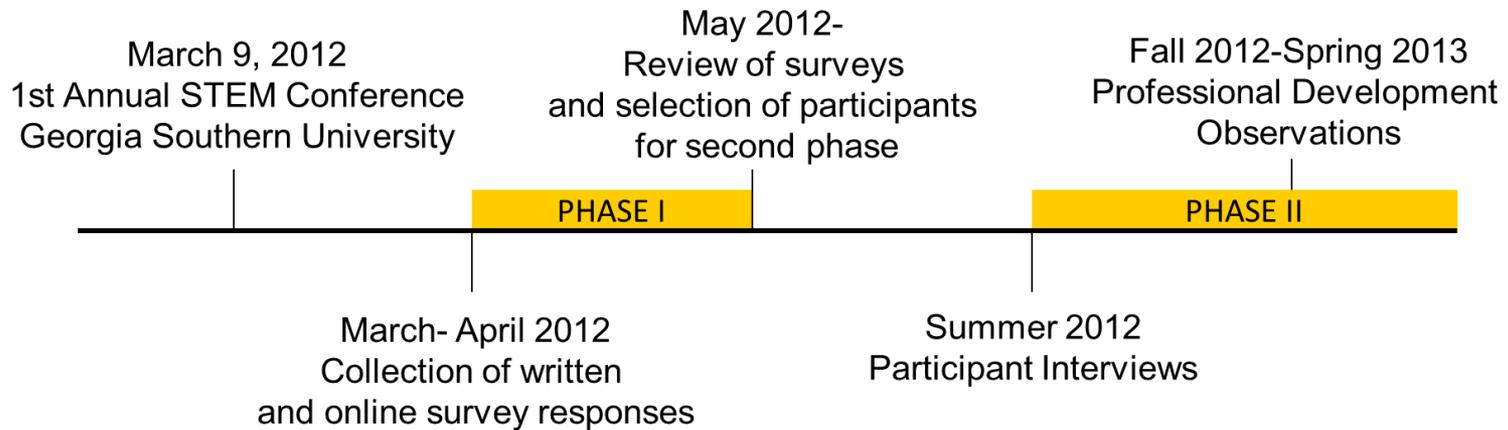
PURPOSE

To investigate in-depth one model of professional development and determine its influence on university STEM faculty members' pedagogical content knowledge and their teaching practice.

Our work extends beyond the traditional assessment of participant satisfaction.

The question that guided the research is: How does conference participation impact STEM faculty members' thinking and practice?

TIMELINE



CONTEXT & FRAMEWORK

With sponsorship from the University System of Georgia's Board of Regents, Georgia Southern University hosted a one-day Scholarship of STEM Teaching and Learning conference

The study is grounded in understandings of academic development that support professional growth and reform-based practice, with focus on what constitutes evidence of conference impact.

Concentrations - (a) changes in participants' thinking about teaching, (b) relationship between thinking and action, and (c) links to student learning.

RESULTS FROM PHASE I

Evaluation went beyond asking about participants' satisfaction. Of the survey respondents:

- 81% rated the conference as having met their professional learning goals,
- 95% indicated that they learned something of value from the conference,
- 62% found opportunities for collaboration at the conference, and
- 95% reported that the conference was a worthwhile experience.

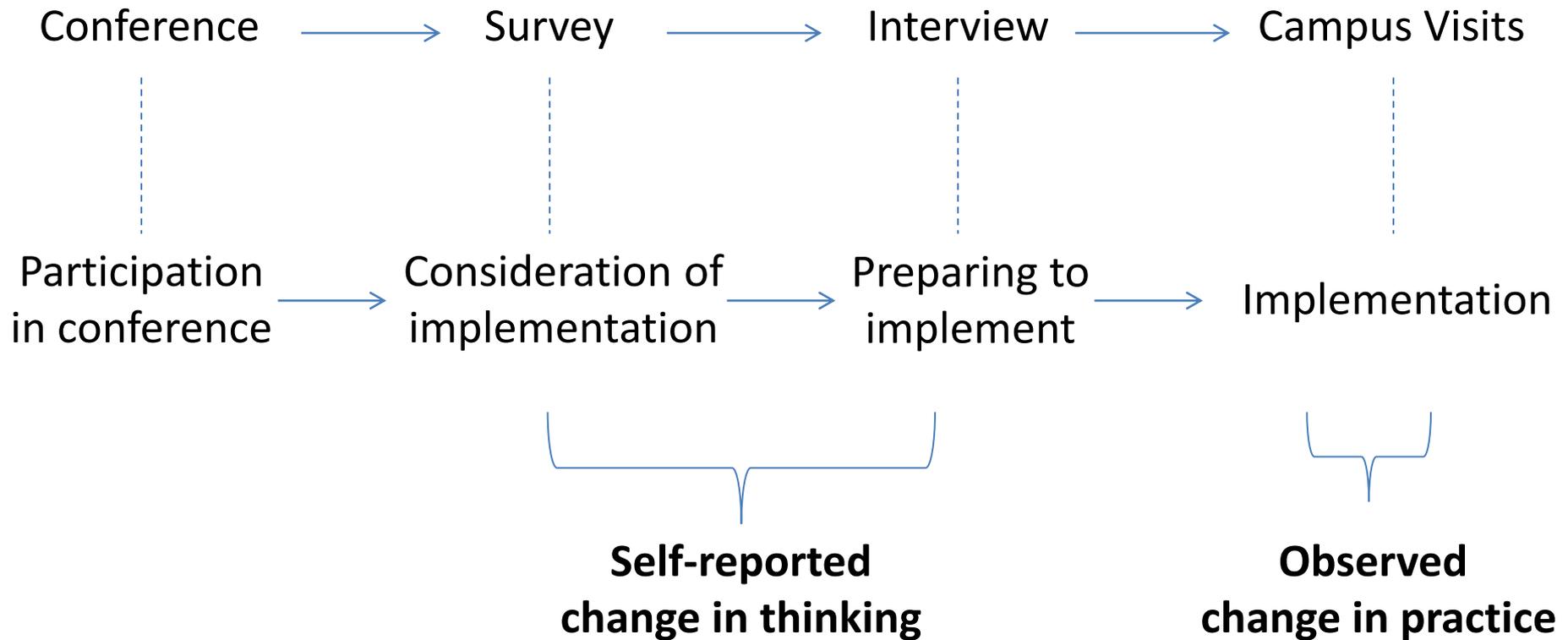
Respondents' comments "on the changes that you will likely make to your teaching practice as a result of participating in this session" revealed strong associations between participation in specific sessions and self-reported changes in thinking and practice.

RESULTS FROM PHASE II

Phase II is complete and involved a subset of Phase I participants in two data collection activities:

- Summer interview
- Visit to the participant's campus during fall semester 2012

RESULTS FROM PHASE I & II



SURVEY	INTERVIEW	CAMPUS VISIT
<p>Most Valuable Learning Experience The “hall talk” or meeting with like-minded colleagues and STEM folks who care.</p>	<p>“I think talking with people in the halls and you know, the pick-up conversations you get are very often where you really learn things and really figure out what’s going on” (p 3, line 106) “I didn’t really understand what the whole initiative was and so I found out a lot more about it when I was there by walking around and talking to people” (p 4, line 114)</p>	
<p>Science Classes Online Can Improve Instruction & Online Homework in Organic Chemistry I only saw the “online class talk” and it was very good. I might teach online- I would not have said that yesterday.</p>	<p>“I really want to design a new non-majors science course on integrated science or the nature of science and take an integrated approach to all the content areas” (p11, line 373) “As I sat listening to that woman, I thought, maybe what I want to do is design it as an online course” (p11, line 391-393) “That online inspiration I got has really taken off and I am moving a great deal of my energy and research in that direction,” “I am using eLearning extensively in both courses” (email, 10/21/2012)</p>	<p>Currently using <i>LearnSmart</i> and <i>Connect Technologies</i> in non-majors biology course. (11/15/2012) “It would be a cold day in you know where for me to devote time to online learning. But after attending the sessions, I thought I’d give it a try.” (S. Jones, 11/15/2012) Through her work with the <i>LearnSmart</i> staff, she has been invited by McGrawHill to develop new questions for the system. (11/15/2012)</p>
<p>Using Backwards Course Design to Reinvigorate STEM I already work with my younger colleagues, and I am going to see about doing more.</p>	<p>“One thing is I very actively stick up for and mentor my new colleagues...I sometimes try to step up and be a buffer between them and old colleagues” (p8, line 278-281)</p>	<p>Participant spoke about how the session encouraged her to think about the support that she could provide to untenured colleagues. (11/15/2012)</p>
	<p>“The most direct thing that would link to the STEM conference...was my...realization that I needed to go back and be even more active in my mentoring and encouraging them to develop into the kind of teachers they want to be” (p15, line 516-518) “if you guys came I would really like to do something different which would be to get my junior colleagues together and talk about teaching because I think that’s where you’ll see some of the things that I went home with from that conference” (p 16, line 556-558) “The most direct thing that I took home was this desire to keep working with my colleagues” (p16, line 561)</p>	<p>Participant discussed advocating on behalf of younger, untenured faculty for resources and travel funding. She stated that she felt comfortable confronting other senior faculty members who were not always supportive of the younger faculty. (11/15/2012) She has discussed the <i>LearnSmart</i> system with her colleagues who view her work as something that will benefit the entire biology department once minor problems are detected and corrected through recommendations by her and her students. (11/15/2012)</p>

SURVEY	INTERVIEW	CAMPUS VISIT
<p>Session: A medley of successful active-learning methods “Use whiteboard to encourage collaborative learning my class.”</p>	<p>“Walking out of Sarah’s session, I am now very tempted to actually use the whiteboard...to encourage more collaborative problem solving during my class.” (p. 3, line 96)</p>	<p>During the campus visit, researchers observed whiteboards in the Dr. Basu-Dutt’s office. The participant described implementation in summer workshop with faculty and in classroom with students during the fall semester</p>
<p>Session: Using caselets for reflection on teaching dilemmas “Develop similar caselets for peer leaders and supplemental instructions for undergraduates.”</p>	<p>“So once I came back from the conference, I have actually talked to the people who lead these (PLTL) initiatives on our campus and showed them examples.” (p. 4, line 135)</p>	<p>Researchers spoke with colleague and verified Dr. Basu-Dutt’s intention to implement caselets for peer leaders on campus.</p>
<p>Session: STEM II Initiative-Nathan Moon, Tim Howard, Judy-Awong Taylor, Rosalie Richards “Improve programs related to STEM II funding at Univ. of West GA.”</p>	<p>“I was really happy to hear Judy’s group at GGC doing extremely well with service learning. So you know, when we came back to our campus, we went back and re-thought about how we can increase that experience with our students” (p6, line193)</p>	
<p>Session: STEM II Initiative-Pamela Gore, Dabney Dixon, Charles Kutal, Farooq Khan “Improve West Georgia’s program.”</p>	<p>“I kind of took ideas from Georgia Tech as well as UGA’s website that they had developed for their STEM II initiative” (p6, line 210)</p>	

SURVEY	INTERVIEW	CAMPUS VISIT
<p>Most Valuable Learning Experience: Excellent lunch keynote- focus on individual student.</p>	<p>“I was in the mood to ...think and reflect and he kind of helped me do that” (p1,line36) “it kind of brought me back to the point to remembering the reason that I do all of this is for the individual students in my classroom and focusing on them and encouraging their learning, supporting their learning” (p 2, line 40) “he just kind of made it personal for me that you are teaching individual students with individual needs” (p2, line48)</p>	<p>Participant discussed the influence of the speaker; his remarks encouraged her to focus on the “individual student” and she now provides several opportunities for students to demonstrate their learning. She increased number of assignments and dropped lowest grade as a result of this session.</p>
<p>Session: Preparing and Fostering Learner-Centered Faculty – Soleil & Llewellyn Many ideas for training new science/math faculty-> will be implemented in summer</p>	<p>“We are developing a workshop for all of the new faculty coming into our college...and this session was very helpful for that” (p2, line 68) “I took away a lot of references that I pulled from there. It kind of helped me. (p3,line 73) “Their session really got me going in the right direction” (p3, line 100)</p>	<p>Participation in the conference sessions provided suggestions that were incorporated into a Summer Workshop led by the participant and two others. Journal articles referenced in the session were shared. A research study was initiated to learn more about the impact of the workshop on new faculty members’ teaching.</p>
<p>Session: Fixing the Leaky Pipe at the Source – Weigert Consider freshman seminar course in department.</p>	<p>“That was something we’re thinking, we’re talking about with the department and we also want to incorporate” (p5, line 143) “I hope over the next week this might be something that we can talk about a little bit more and maybe incorporate into our curriculum” (p3, line 146)</p>	<p>Dr. Gatch initiated discussion with colleagues regarding the need for either a freshman or senior 1-credit hour course for the purpose of ensuring that students are learning what they should learn. Her desire is that all GSU physics majors achieve the same level of understanding across a specified set of learning outcomes.</p>
<p>Session: Inquiry-Oriented Pedagogy & the Nature of Science – Jones, very active session</p>	<p>“This is where it really brought it back to the classroom level for me and working with my individual students because it got me thinking again about activities” (p6,line 192) “Do I need to develop some new activities to think about some things in a different way? So it was useful” (p6, line 196)</p>	<p>The session encouraged Dr. Gatch to consider how to incorporate more hands-on/minds-on experiences into her introductory physics courses. Some of the experiences could involve students working collaborative during lecture sessions. She considers this difficult to accomplish in course sections of about 170 students, but is continuing to explore options that especially addresses the needs of her more technology-oriented students.</p>

SURVEY	INTERVIEW	CAMPUS VISIT
<p>Most Valuable Learning Experience More collaboration. More reflection.</p>	<p>“When I go to a conference, such as the one I attended at Georgia Southern, I will find interesting ideas from sister disciplines...that I can incorporate in my classroom” (p 3, line 88-90) “I can simultaneously think from the broader angle and from a narrow angle and benefit in both respects by attending a conference such as yours”(p 3, line 105)</p>	
<p>Session: A Medley of Successful Active Learning Methods – Sarah Formica Excellent session. <i>No rating.</i></p>	<p>“As a result of this participation, I wrote a mini-grant as a part of my STEM Initiative and I’m going to incorporate some of her ideas” (p 4, line 117) “I came back inspired by what she had been able to do with existing tools...we can meaningfully place materials online so that one can use one’s class time more effectively” (p 4, line 124-127)</p>	<p>Dr. Kahn learned about online tools that Sarah uses in physics courses and saw application of the tools in Physical Chemistry courses. Student chemistry course super leaders, Chris and Elise, confirmed Dr. Kahn’s efforts to incorporate online tools into lectures, labs, and workshops, particularly in the Quantum Mechanics course in the Physical Chemistry sequence.</p>
<p>Session: Guided Inquiry and Tablet PCs in Chemistry I will attempt to implement these!</p>	<p>“As I develop my mini-grant further I’m going to look at the possibility of developing materials that are suitable for viewing by students on an iPod or an iPhone” (p 5, line 166)</p>	<p>Chris and Elise also described their conversations with Dr. Kahn about making use of Tablet PCs in Physical Chemistry courses Artifact: Dr. Khan’s mini-grant proposal</p>
<p>Session: STEM II Initiative-Gore, Dixon, Kutal Very informative to see approaches at sister schools.</p>	<p>“I haven’t had a chance to incorporate any of the ideas but it certainly makes me more informed” (p 6, line 186) “We are thinking of developing questionnaires and inventory of sorts where we examine what the students know at the end of the first year, second year, third year, etcetera” (p 6, line 192)</p>	<p>Conversation with Dr. Swamy Mruthinti, Associate Dean of College of Science and Mathematics, and Dr. Myrna Ganter, PI of STEM II Initiative at West Georgia, confirmed that Dr. Kahn is now looking at learning and assessment as linked in significant ways. Rather than viewing assessment solely as a means of generating student grades, Kahn now sees assessment can serve a diagnostic function.</p>
	<p>“I came back thinking more broadly about some of the ideas that I have and I felt that what I’m trying to do on a very small scale indeed does play a role in its own small way as a part of a bigger puzzle...it was in part inspirational, in part comforting to know that some of the work that I’m thinking falls in line with ideas that other individuals have” (p 7, line 219-222)</p>	