

New Instructors' Socialization Process in Research Intensive University

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Abstract

We assessed the socialization process of new faculty in chemical and biological sciences departments at a research intensive university. Eleven new faculty were interviewed when they arrived and three years later. Through an iterative process by three researchers, four main themes were chosen as foci: teaching challenges, teaching and learning resources, teaching philosophy, and socialization process. We identified three different socialization processes that new faculty members could experience in their first three years, which fit with self-determination theory: Gaining competence through relatedness; Gaining competence through autonomy; Seeking competence. Changes in teaching philosophy were evident, including modification of goals and use of appropriate terminology. Based on the finding, we suggest resources that universities could offer to ease new faculty member's adjustment.

Objectives or Purposes

This study explores the socialization process of new chemical and biological science faculty members in terms of their teaching responsibilities in a research-intensive university. In the last decade, there has been a strong national and international recommendation (AAAS, 2009, 2010; AAMC-HHMI, 2009; NAS, 2007; Woodin, Carter, & Fletcher, 2010) to improve teaching in higher education, especially in STEM fields. These recommendations stem from the high level of dissatisfaction among STEM undergraduates with the instructional methods used (Seymour and Hewitt, 1997; Henderson, Beach, & Finkelstein, 2008, 2011). The recommendations have emphasized changing teaching strategies from passive student learning to active engagement as a means to promote critical thinking (Handelsman, Miller, & Pfund, 2007; Knight, & Wood, 2005; Redish, 2003; Wiggins & McTighe, 2006; The White House, 2009).

One way to help instructors incorporate these national recommendations in their classrooms is through university teaching and learning centers. Our university established a disciplinary Teaching and Learning Center (TLC) in the college of Chemical and Life Sciences whose mission is to provide support to new and experienced faculty members, both individually and through faculty learning communities. We followed 11 new faculty members for three years as they adjusted to their teaching positions. We focused specifically on new faculty members because they often experience social isolation on campus (Boice, 1991; 1992; Williamson, 1993). Teaching, in particular, represents a challenge for them, especially if they receive poor teaching ratings from students and lack support and information regarding teaching (Boice, 1991). Thus, the services provided by the TLC had the potential to ease their adjustment.

We focused on the following research questions: 1) What are new faculty members' concerns? 2) What teaching and learning resources did faculty members use in

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adjusting to their new position? 3) Can we identify different socialization processes based on new faculty members' experiences? 4) Did the new faculty members' teaching philosophy change over time, and if so, how did it affect their reported teaching practices? We collected qualitative and quantitative data. We will describe more of our findings and bring rich data in the paper.

Theoretical Framework

One way to view a new faculty member's socialization process is through self-determination theory (SDT; Deci & Ryan, 1985), which posits that in order for people to function optimally in their roles, they need to fulfill three innate psychological needs: competence, relatedness, and autonomy (Ryan & Deci, 2003). **Competence** refers to engaging in challenges, gaining skills and knowledge, and feeling effective. For new instructors this might involve feeling effective in their ability to teach and learn new teaching strategies. **Relatedness** refers to securing, maintaining, and deepening one's connectedness to social groups. New instructors might fulfill this need by forming relationships with other faculty members. **Autonomy** refers to developing and expressing interests, values, and capacities. For new instructors, this might involve feeling a sense of control and independence in their teaching. Fulfilling all three needs has been found to increase intrinsic motivation and enhance performance, persistence and creativity (Ryan & Deci, 2000). Social and cultural factors play a large role in facilitating or undermining the fulfillment of these needs. Within the context of a university, we would expect the department, college, and campus environment to greatly influence a new faculty member's adjustment.

Methods and Data Sources

Sample

We interviewed 11 faculty members, first in 2007 shortly after they came to our university and again three years later in 2010. Demographics of those interviewed was: five females and six males; nine tenure-track faculty (with research and teaching responsibilities) and two non-tenure-track lecturers (with only teaching responsibilities). Seven faculty members joined faculty learning communities after their arrival.

Instrumentation and Data Analysis

We used a semi-structured survey with open-ended questions that has previously been used in science education research (Author, 2005). It was adapted for this study and validated with department chairs, a science educator, and an outside evaluator (Appendix 1). The interviews were conducted in the office of each interviewee, and lasted 40-100 min per interview. All of the interviews were audiotaped and later transcribed. Three researchers (the two who conducted interviews and an outside evaluator specializing in educational psychology) analyzed the transcribed data. Four main themes were chosen as foci (teaching challenges, teaching and learning resources, teaching philosophy, and socialization process). The transcribed interviews were individually analyzed by each researcher and were summarized to create a two page case study for each interviewee (Appendix 2). Through an iterative process by the three researchers, a summary paragraph was constructed and supplemented with attendance and participation data for workshops and other professional development activities. Finally, the summaries were reviewed by a fourth researcher.

Results

(1) What are new faculty members' concerns?

Based on analysis of the interview transcripts, we identified six themes relating to concerns of new faculty members when they entered their new positions. These themes are balancing teaching and research (9 of 11 faculty members), engaging students in the classroom (6), developing a teaching style that benefits the students as well as the instructor (4), dealing with procedural challenges (4), writing assessment tools and grading (4), and feeling insecure about the topic that they were assigned to teach (2).

(2) What teaching and learning resources did faculty members use in adjusting to their new position?

Based on the information collected through interviews and attendance records, we identified four main categories of resources used by faculty (Appendix 3): 1) individual assistance from other departmental faculty, 2) workshops and seminars, 3) individual assistance from the TLC or campus teaching center, and 4) faculty learning communities. The interviews provided insight into the ways in which new faculty members benefited from each type of resource. We will elaborate on each in the full paper.

(3) Can we identify different socialization processes based on new faculty members' experiences?

Based on our analysis of the interviews, we identified three different socialization processes that new faculty members could experience during their first three years. These processes fit with self-determination theory (Deci & Ryan, 1985), therefore when creating names for the processes, we used the language of the theory. The processes are: I) Gaining competence through relatedness, II) Gaining competence through autonomy, and III) Seeking competence. It should be noted that competence here refers to faculty members' perceptions rather than objective measures of competence. In the paper we will elaborate on each trajectory via case studies that exemplify each of the three socialization processes.

- I. Gaining competence through relatedness** refers to a process in which faculty members gained a sense of effectiveness in teaching by developing relationships with peers and engaging in collaborative professional development opportunities. Relatedness was primarily manifested in faculty communities centered on teaching. Six individuals fell into this category, and all of them joined communities. They reported that they received support from the communities through individual mentoring in teaching, collaborating on large-scale initiatives with experienced faculty members, and regular opportunities to discuss classroom issues, obtain ideas, and receive feedback. One faculty member explained how stepping into an existing, innovative course made it easier for him to adopt new teaching approaches because he had assistance from the community members who had originally developed the course. The new faculty members described how they received encouragement from other community members to engage in professional development activities. "You have the support for doing innovation. Also [they gave] me ideas for doing things, like concept maps It's having that meeting once

a month and knowing that there are people that think what you're doing is important.”

II. **Gaining competence through autonomy** refers to a process in which faculty members developed a sense of effectiveness as instructors in an independent manner. This does not mean that these faculty members never sought assistance, but when they did so it was for specific reasons rather than for general and consistent support. Thus, their socialization process was more characterized by autonomy rather than relatedness. Three faculty members fell into this category. They each reported that the professional development opportunities they participated in were selected for very specific reasons. For example, one faculty member wanted to learn about clickers as a way to relate to the diversity of students in a large class, so he attended a workshop focused on clickers. Each of the faculty members in this category sought advice from departmental colleagues, however, they did not generally feel the need for additional peer support for their teaching. “I think I’m the one who ultimately has to prepare the course and when I taught it for the first time there were certain areas where I thought, 'okay I will have to do this differently next time or explain this differently next time,' but I’m not sure anybody outside could help me with that.”

III. **Seeking Competence** refers to faculty members who struggled to adjust to their new position and after three years had yet to feel a strong sense of competence as instructors. Two faculty members are included in this category. One individual made use of many teaching resources, such as joining a community, whereas the other individual did not seek assistance. However, both felt that after three years they had not reached the level of competence in their teaching that they desired. This illustrates that new faculty can face barriers even when they seek out professional development opportunities. One of the faculty members described his difficulties co-teaching with an experienced instructor when he first came to his new position. He said that students always compared him to the experienced instructor and complained about his teaching style and grading. In addition, he indicated that co-teaching made it difficult for him to develop his own teaching style.

(4) Did the new faculty members’ teaching philosophy change over time?

At the time of the first interview, only one of the faculty members had formally thought about and prepared her teaching philosophy. The others reported that they had not given much thought to their teaching philosophy and had never needed to craft a formal statement of teaching philosophy. After three years, the faculty members had developed more formal teaching philosophies that incorporated a variety of goals and objectives. We categorized these into the following four different themes and related them to the faculty members' reported teaching practices: I) Teaching for understanding instead of memorization, II) Interacting with and engaging students, III) Relating to student diversity, and IV) Relating to everyday life and scientific research (Appendix 3). These changes in teaching philosophy reflect increased alignment with national recommendations to teach in a way that fosters active engagement of students and

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promotes critical thinking (AAAS, 2009, 2010; AAMC-HHMI, 2009; NAS, 2007; Woodin, Carter, & Fletcher, 2010). In the full paper we describe how individual faculty members changed their philosophy over time and how those changes influenced the teaching practices they used in their classrooms.

Scientific Significance of the Study

In this study we looked at the socialization process of new faculty coming to a research university. We found that most new faculty members came without a formal teaching philosophy and all desired some kind of assistance with teaching. This highlights the importance of providing comprehensive professional development resources to help faculty members adjust to their new roles. While some faculty members used and benefited from many professional development resources, others used very few. The interviews revealed that there is no single optimal model for supporting new faculty members in their transition, since what helps one faculty member (e.g., team teaching) could hinder another. Instead, support needs to be flexible, and institutions should offer a menu of professional development opportunities from which faculty members can choose. Moreover, the socialization process of new faculty members followed three different trajectories that aligned with self-determination theory. Understanding the trajectory of individual faculty members could be important for identifying and addressing unfulfilled needs. This represents a unique study in that it utilized longitudinal research to characterize the experiences of new faculty members over their first three years. The qualitative nature of this study provided rich data with which to explore the teaching experience of these faculty members at a research university.

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Appendix 1: Interview for new instructors (pre-interview)

1. Did you have any experience as a teacher (TA, guest lecturer, etc)?
2. What is your teaching philosophy?
3. What should chemical and life-science majors acquire in their undergraduate studies?
Pay attention to the following aspects:
 - a. Content knowledge
 - b. Laboratory skills
 - c. Scientific writing and reading
 - d. Understanding the dynamic nature of science
 - e. Understanding the applicability of science to everyday life
 - f. Understanding of what scientists do?
 - g. Historical views
 - h. Motivation to continue in the field
4. As a student (undergraduate/graduate), were you exposed to approaches for teaching and learning other than lecture? Do you think that you will use them in your teaching? (How?)
 - a. Case studies and/or problem-based-learning
 - b. In-class discussions
 - c. Out-of-class discussions (virtual chat, bulletin board)
 - d. Critical writings (reflective journals, summaries, essays, critiques)
 - e. Group work
 - f. Visual-based instruction (streamed video or CD)
 - g. Games & Simulations
 - h. Problem solving
 - i. Online Presentations
 - j. Role-play
 - k. Directed research
5. As an undergraduate student, how did you interact with your instructors after classes (e-mail, office hours, web, question box...)
6. How do you think that you are going to interact with your students?
7. How do you envision your class sessions? (for example, review of the last session in the first 10 minutes, time for questions, etc.)
8. How did you build the syllabi? Do you use the Blackboard?
9. How do you build the course assessment? Do you use any alternative assessment?
10. How do you learn about your students' background knowledge in order to relate to the diversity in the class?
11. How do you feel about teaching? Do you like teaching? Why or why not?
12. What do you think would help you to prepare to teach your first class (workshops from CTE, mentoring from your colleagues, participating in a support group, etc.)
13. How do you plan to divide your time between research and teaching? Are you concerned about being able to do a good job at both?

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Appendix 2: Example of a case study that was built for each interviewee

Brian (pseudonym) is a male who started his position as an Associate Professor in a tenure-track position. He came with some experience in teaching small classes as a postdoc. In his first interview he has a teaching philosophy that included several themes, such as wanting students to enjoy the class and helping them develop skills that will allow them to work on their own.

I want the students to enjoy the class as much as possible... and I do want to push them to work hard. I want them to feel that... they're really working on developing, beginning to develop some really important skills. For example, the lab component we're working on right now for our class, the philosophy is to use all kinds of tools that will be available to them once they leave this class and the University... I can't teach them everything about [the course topic] so, but I do want them to feel that they can actually go and do it on their own. They can either through purchasing books and continuing their training or going to other labs and being able to develop things on their own....

In the first interview, he expressed his enthusiasm for teaching, "Oh I like it, I like it. I think I enjoy it, I put a lot of energy into it, I'm definitely committed to it and I will enjoy it." When he was asked what would help him in his teaching, he replied that he would like to get advice about what would be the best method to present information to the students and he reported that he sought advice from other faculty.

... What have been the formats that are most successful because this is something I did actually talk to many people about, do I use chalk on the board, PowerPoint... and I've gotten all kinds of answers from faculty members, some that I like and some that I do not like. It seems writing and really slowing down lecture to me it seems like really an ineffective way of delivering material and I would really much rather focus on delivering material and making it a full learning experience.

In the second interview, he described how he joined a community and benefitted from the interaction with faculty and the director of the TLC.

Yeah I mean, the [name of community] has been fantastic. Because I had not taught before coming to campus. I had taught in small workshops, a couple of lectures. I had taught to graduate students, I had taught medical students... and I had not taught undergraduate students. I think our [community] has been great. And our interactions with the director of the TLC.

Brian also reported that he participated in almost all TLC activities, "I learned a lot actually. The 'less is more' is definitely something I've learned from workshops and from experience.... I've been wanting to build a concept list, real clear concept list for my class." He reported that in his classes he is using case studies, problem-solving, class discussions,

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group work, visual-based instruction, and occasionally directed research. In the second interview, Brian had a teaching philosophy that included the themes of teaching fewer concepts in more depth, using many components of active learning, and emphasizing how the course material connects to everyday life and current scientific research.

My team-teaching philosophy has been evolving since I came here. I think it's a cliché one, but I think my philosophy right now is "less is more." ...My first year, when I first taught, I taught a lot of concepts. And the final exam time was really depressing because I realized how little they had learned. And I realized I was throwing too much at them and not realizing how much they were not learning. So the year after, I reduced the concepts I wanted to cover by about 10% I would say. And I still have the same difficulty. Now I think I have reduced maybe 20-25% of the material I cover.... I've been illustrating things more, ... the class participates quite a bit more. I really try to engage them, and I succeed in doing that actually... [I use] illustration as much as I can on the board. I use PowerPoint, the board. I illustrate with things that I brought to the class actually, and they really like that. I've shown movies about certain processes that I get from the web. Every once in a while I hear a news report that's very relevant to our classroom. I bring it to the class. So we start with what I heard on NPR an hour ago. They like that component because it shows them that what they're doing is real, it's happening out there, it's not just a hypothetical or theoretical. People are using these technologies today. What I succeed certainly in conveying is what they're learning is very important today and at the leading edge of research today.

In the second interview, Brian again reported that he likes teaching, but he acknowledges that it is demanding and involves procedural challenges.

I like it. Not when I'm doing it, I like it later. It takes a lot of time. I like to do it well, and it's very demanding. I like it when they learn, when they provide nice answers, when they come back a year later and say you've changed my life, my career, my scientific career...I like that. The part I really don't like is when two of them miss the midterm. The day-to-day dealing with the undergrad students and their various issues. This year I have one student dealing with severe mental health problem. Another one is dealing with severe substance abuse problem and they're missing classes and I spend a lot of time trying to reschedule their exams.... I mean, these are things that you don't get trained to do...

When he was asked about his concerns, he responded that he is concerned about balancing research and teaching.

Oh, I'm always concerned. Yeah, I can do a better job at teaching and I still think that I don't have time to do enough. And I could do a better job at research... it's very difficult to balance both. We are expected to be very good teachers. We are expected to bring in a lot of grants. I'm sure you'll hear this from everyone...

Appendix 3: Main resources used by new faculty and summary of their post-interview teaching philosophies

Rank / Gender	Main resources used*	Summary of post-interview teaching philosophy**
Lecturer/ Female	1) Faculty learning community (founder and leader) 2) Workshops 3) Individual TLC assistance	1. Leading students toward understanding (I) 2. Presenting material in different ways (III)
Lecturer/ Female	1) Faculty learning communities (several) 2) Workshops 3) Individual TLC assistance	1. Highlighting importance of students' questions (II) 2. Acting as "more of a facilitator rather than a teacher" (II)
Assistant Professor/ Female	1) Faculty learning community 2) Workshops/books 3) Individual TLC assistance	1. Increasing students' engagement (II) 2. Teaching in an interdisciplinary manner (IV) 3. Emphasizing relevance to everyday life (IV)
Assistant Professor/ Male	1) Faculty learning community 2) Workshops 3) Individual TLC assistance	1. Focusing on student learning rather than grades (I)
Assistant Professor/ Female	1) Faculty learning community 2) Workshops	1. Teaching for understanding content for long-term usage (I) 2. Engaging students (II) 3. Being aware of differences in prior knowledge (III)
Assistant Professor/ Female	1) Workshops 2) Individual TLC assistance	1. Keeping students interested in the material (II) 2. Relating to students' different learning styles (III)
Assistant Professor/ Male	1) Workshops	1. Emphasizing learning for understanding (I) 2. Relating to students' different learning styles (III) 3. Relating material to real-world problems (IV)
Assistant Professor/ Male	NA	1. Encouraging students to think not just memorize (I)
Associate Professor/ Male	NA	1. Trying to guess what the students find most confusing about the topic –striving for clarity (I)
Associate Professor/ Male	1) Faculty learning community 2) Workshops 3) Individual TLC assistance	1. Teaching fewer concepts in more depth (I) 2. Using active learning (II) 3. Providing links to everyday life and current scientific research (IV)
Associate Professor/ Male	1) Faculty learning community 2) Workshops	1. Achieving clarity (I) 2. Emphasizing students' engagement in the learning process (II) 3. Connecting the material to everyday life and to research (IV)

*In parentheses are the teaching philosophy categories: (I) Teaching for understanding instead of memorization; (II) Interacting with and engaging students; (III) Relating to student diversity; (IV) Relating to everyday life and science research