

Situated Learning and the Development of Relationships: Bridging the Gap between Veterinarians and Researchers

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Abstract: The development of the student teacher relationship has been largely ignored within the tenets of situated learning. Here we report the results of a mixed method study that explored relationships between researchers and veterinarians in a biomedical techniques training program designed theoretically and practically from the lens of situated learning.

Introduction

Research has shown that there is a significant lack of attention to the role of teacher-learner relationships and their impact on adult learning (Robertson, 1996; Tiberius, Sinari & Flak, 2002). “This lack of attention given to the relationships between teachers and learners can be seen as problematic, as it has been argued that not only are teaching and learning activities embedded within the context of relationships, but research has found that nearly half of the variance in the effectiveness of teaching is associated with relational variables” (Jarecke, 2012, p. 313). Furthermore, this oversight is particularly problematic when understanding learning within context of situated learning (Lave & Wenger, 1991). Even though situated learning emphasizes the social aspects of learning, significant questions remain about the development of relationships and implications they have for a community of practice.

In response to this oversight a recent study provided the opportunity to explore the development of relationships at a nearby research medical facility that was implementing a training program about the humane care and use of laboratory rodents. The program was designed theoretically and practically from the lens of situated learning, based on two assumptions: a) that promoting authentic learning experiences is an important strategy in promoting adult learning, and b) that pairing experts (veterinarians) with novices (researchers) in “cognitive apprenticeships” would help assimilate learners into a community of practice (laboratory animal science) (Dobrovolny, Stevens, & Medina, 2007). Even though research demonstrates that students benefit from authentic experiences (hands-on training) while learning biomedical techniques (Cavalieri, 2009; Moore & Noonan, 2010), this body of work overlooks the peripheral impact of researchers becoming members of a community of practice (developing relationships with veterinarians) and the implications for relationships as an outcome of authentic *in-situ* training.

Therefore, the purpose of this mixed method study was two-fold: a) to examine the perceptions of researchers of their relationships with veterinarians as result of participating in a hands-on laboratory rodent training program framed theoretically in situated learning; and b) the role of *in situ* training experience in the development of those relationships.

Theoretical Framework

This study is theoretically framed under the tenets of situated learning theory, recognizing that students learn, as apprentices, within a community of practitioners, using the tools and language of the field. Situated learning emphasizes the social nature of learning

whereby the goal is to increasingly involve the student in a community of practice (legitimate peripheral participation—moving from the margin to the center) as they become members (Young, 1993). Furthermore, it emphasizes the importance of creating authentic and supportive learning environments allowing for the exploration of complex challenges of everyday life. Despite this emphasis on the “social,” it theoretically overlooks the complexity of learner-teacher relationships as a construct (Jarecke, 2012). More specifically, it does not recognize how these relationships are shaped by social and institutional norms; the imbalance in power between learner and teacher; the potential “relative vulnerability and discomfort of the learner compared to the teacher” within these relationships (Tiberius, Sinai, & Flak, 2002, p. 466) and the impact of these relational factors on legitimate peripheral participation (newcomers) and learning in communities of practice.

For the purposes of this study, “relationship” is defined according to relational-cultural theory (Miller & Stiver, 1997). This theory recognizes power differentials that exist within both sociocultural contexts and in interpersonal relationships. Experiences between individuals that foster growth psychologically and are relationship-sustaining are called connections, while events that interrupt mutually empowering or mutually empathetic interpersonal interactions are disconnections. This theory asserts that connections and disconnections occur in all relationships and that future outcomes are dictated by how those events are handled.

Methodology

A quasi experimental mixed method approach (Creswell & Plano-Clark, 2007) was used to compare student perceptions of their relationships with veterinarians and animal care staff (teachers) before and after a training session on laboratory rodent handling. This work was based on a larger study that measured comfort levels with laboratory animals and willingness to collaborate with veterinarians as a result of attending hands-on training sessions theoretically and practically based in situated learning (Whitcomb & Taylor, 2014). The training program was established in 2010 and prior to this date training was only available in a computer based format.

The Responsible Care and Use of Laboratory Animals Training Program is a series of eight training sessions, each lasting 2-3 hours. The course director is a veterinarian, board-certified in laboratory animal medicine, and sessions are facilitated by volunteer veterinarians, animal care technicians, and researchers. During each hands-on training session, students work closely with teachers (3 students or less with each teacher), using materials and instruments commonly available in the laboratory setting (tools of the trade). Scaffolding is utilized by the teachers (Dobrovolny, Stevens, & Medina, 2007) to support students until they are able to perform each technique independently. Discussions during class center on managing common complications and alternative methods in order to help students cope with everyday challenges of biomedical research.

Data collection involved participants completing anonymous online surveys before (n=49) and after (n=35) the training sessions. Discrepancies in the pre- and post- survey response rate are explained by transient students who left the institution before they could complete the last survey. Survey questions were comprised of both Likert-Style questions and open ended questions. Likert-Style questions asked participants to rank (1=poor, 5=excellent) the likelihood that they would contact veterinarians for specific types of assistance before and after training. Open ended questions asked participants to describe aspects of the training program that promoted or did not promote collegial relationships between instructors and students. The first survey was designed to collect demographic information and provide opportunities for self-

reporting of the participant's perception of the veterinarian-researcher relationship prior to the training. The follow-up survey was designed to allow self-reporting about the nature of the veterinarian-researcher relationship after completing the first training session. The surveys were separated by three weeks in order to allow all participants to complete the first training session. Semi-structured interviews were conducted with a purposeful sample of study participants (n=10); a sample restricted to those who had completed the online surveys, had attended at least one training session and were not employees of the Department of Comparative Medicine. Open-ended electronic survey questions and transcripts of recorded interviews were analyzed using open and axial coding followed by constant comparative method (Merriam, 2009) until a consensus was reached on the interpretation of the data. Responses to Likert-Style questions were analyzed using a two-tailed t-test with significance assigned at $p < 0.05$.

Findings

Survey questions relevant to understanding the impact of the training program on relationships focused on two areas: a) the likelihood of contacting veterinary staff and b) whether veterinary staff were the best source of information for laboratory animal care. Participants ranked their likelihood of contacting veterinary staff (trainers) for questions about animal techniques, animal physiology, and animal illness. When these questions were posed before training, mean scores (Likert-Scale, 1= very unlikely, 5= very likely) were 3.82+/-1.00 (SD), 3.76+/-1.03 (SD), and 4.27+/-0.98 (SD) respectively. After the training was complete, mean scores increased significantly ($p < .009$, $.021$ and $.002$) for each question: 4.35+/-0.85 (SD), 4.18+/-0.77 (SD), and 4.72+/-0.57 (SD) respectively. Study participants were also asked to rank their degree of agreement with the assertion that the members of the veterinary staff are the best source of information for laboratory animal care (1=strongly disagree, 5= strongly agree). Mean responses showed a trend toward improvement in score (pre-training: 3.77, post-training: 4.14), but the p value (0.146) did not fall below our established cut off for significance ($p < 0.05$).

Exploring these questions in greater depth in the interviews revealed two themes relevant to understanding the development of relationships within this community of practice: a) Pre-training obstacles to relationships between researchers and veterinarians (*physical and social separation of workspaces, veterinarian as regulatory enforcer*), and b) Factors essential to fostering collegial relationships during training (*creating comfortable social environments, teacher accessibility and spending time getting to know one another*).

This group of students described significant *obstacles to developing relationships* with veterinarians prior to training. All respondents reported that there were limited opportunities to interact with veterinarians either because of physical or social separation. One research technician with over 20 years' of animal research experience captured the nature of the physical separation that she perceived between herself and the veterinarians in this way:

I think we're so far removed from where any of our animals are housed down there we usually are taking our animals up to the lab at the far end of the building so we don't actually see them [veterinary staff] on a day-to-day basis.

Likewise, a research technician in her late 30's with 10 years' experience pointed out that the veterinarians spent most of their time in the animal facilities (located in the basement of the facility), while the researchers mainly work in laboratory spaces on the upper floors of the building: "we're not always down stairs all the time and they're [veterinarians and animal care staff] always down here so you don't always see them..." Many study participants reported that social contact with the veterinarians was not something that naturally occurred to them.

One undergraduate student researcher expressed a common sentiment among participants as he shared that he “never really thought of the veterinarians before we started coming down here [for classes].” Two other research technicians with nine and sixteen years’ experience each echoed this sentiment as they described having no communication or relationship with the veterinarians prior to the training sessions. The technician with the most experience also did not speak English as a first language and for her, asking technicians in her own laboratory for help was more likely since she already had an established relationship with them:

I have a close relationship with my lab mates so I would ask them first (if there were a problem with the animals)...I believe the veterinarians are very professional and I trust them...but I would ask my lab mates first because we are working on the same program and maybe there is something there that they have already encountered.

Beyond the practical aspects of physical and social separation between researchers and veterinarians, two participants reported a disincentive for social contact with the veterinarians as a result of their reputation as enforcers of animal welfare regulations. One participant, a research technologist with over 25 years’ experience, noted that in her experience, the veterinarians only made contact with their laboratory under negative circumstances: “We didn’t have very much contact unless there was a problem with one of our animals and then we’d get a call or something like that.” A graduate student with one year of experience at another institution and two years of experience at our institution explained what she believed to be a global researcher perspective on the role of the veterinarian in animal research:

I think there just is this stigma that gets developed when it comes to Comparative Medicine (the academic department to which the veterinarians belong) that...you’re afraid that they are here to watch you work with the animals...I think everyone’s always nervous that you come up with an experiment...and the veterinarians are going to be your biggest enemy. [You] know that they have to protect the animals.

Despite these significant obstacles to the development of positive relationships between veterinarians and researchers, both practical and apocryphal, study participants reported significant improvements in these relationships as a result of features of the training sessions.

Features of the training sessions that researchers found to be key in developing collaborative relationships with veterinarians were: *creating comfortable social environments*, *teacher accessibility* and *spending time getting to know one another*. Multiple study participants reported feeling comfortable within the classroom environment as a result of “informality of the session” and “trainers who were very welcoming and friendly.” There was a perception that the teachers “seemed to really want to help us.” As the research technologist with the most experience expressed: “I think it was very personable...you could ask questions...it was very relaxed but professionally done.” Working in small groups contributed to the social comfort within the training sessions as participants reported an easing of perceived pressure to perform: “Working in groups with my peers helped me feel more comfortable...if they could do it, then I had confidence I could as well.” “Small groups made it less intimidating if the student were to make a mistake or have a question.” Study respondents also reported that feeling that their teacher was easily accessible in time of need contributed to improvement in relationships: “...they are very good about making themselves available to help, so why would I want to struggle through it [alone]?” “[My] trainer was very open and willing to answer questions. She encouraged me to contact her with questions in the future. I feel that she is very accessible if I should need her.” Finally, participants reported

appreciating the opportunity to spend time getting to know the veterinarians. As one researcher concisely put it: “I think just seeing and interacting with the trainers was enough...getting to introduce myself and interact with the staff over the sessions made me feel much more comfortable with going to them for help.” According to this researcher, it is ultimately the time spent getting to know one another that can bridge the gap between researchers and veterinarians:

Realizing that they're [veterinarians/trainers] real people too, like we have ice breakers at the beginning and just going around the room and realizing that they're real people and they're here to help you not that they're here as veterinarians, you know? They do have this additional role of not only taking care of the animals but helping you do research that involves animals. I think just getting...to know them helped a lot with bridging that gap for me.

Discussion

While there is a dearth of evidence of training in the field of laboratory animal science being framed from the perspective of situated learning, it has been reported that relationships between researchers and the veterinarians who are obligated by federal law to train them are at risk for conflict (Silverman, Christenson, Petursson, & Sramek, 2002). Because this inherent tension exists, it is of particular importance to understand how teaching framed theoretically by situated learning theory impacts the teacher-student relationship. This research finds that students (researchers) valued the time that teachers (veterinarians) took to get to know them and valued having time together in the same space. However, it is important to note that it is likely that the positive relationship building occurred informally and unintentionally, a byproduct of the hidden curriculum, through collaborative involvement among veterinarians and researchers in training activities. Consistent with Jarecke's (2013) research, she found that “relationships are not only a context for the formal learning among students, but also for the informal learning, which is often associated with the hidden curriculum” (p. 260). These findings reveal that as individuals become members of a community of practice much is taking place (e.g., becoming comfortable with each other, working through power differences, trust building) among the members that has a significant impact on learning that is not accounted for in the theory of situated learning. Furthermore, this particular study reveals the importance of making the “hidden” known and a more intentional activity when engaged in relationship building.

This study also reveals features of the apprenticeship model (seeing then doing, working in small groups with an expert, and working together in a relaxed social environment) were meaningful for the students and were significant in developing positive relationships. As a result, researchers (students) reported being more likely to contact veterinarians (teachers) when assistance was needed. This building of positive relationships stands to promote open communication between researchers and veterinarians, creating increased opportunity for collaboration and promoting animal welfare.

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