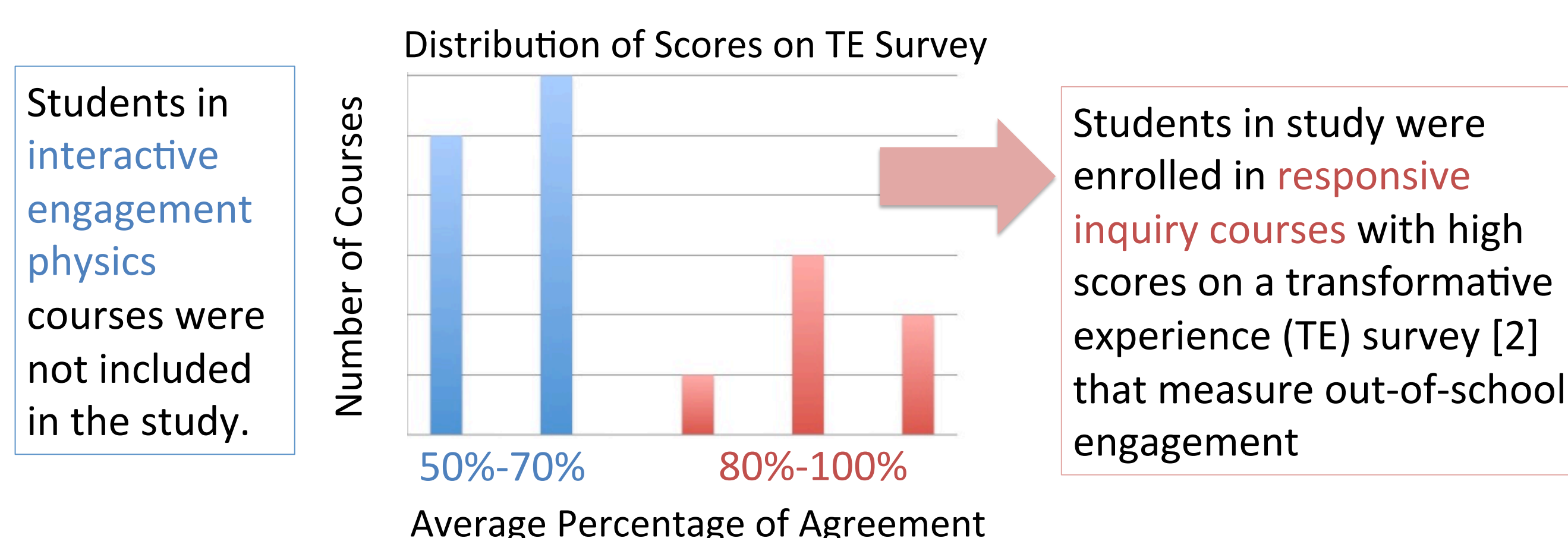


Abstract

Based on written responses to surveys and interviews with students enrolled in undergraduate science courses, I share and analyze examples of students' sharing their science learning with family and friends. These examples highlight the role that positive self-efficacy and pride play in motivating students' choice to engage family and friends and also how students' satisfaction in engaging others can be influenced by the interest, capability, and knowledge differential of their interlocutors.

Context for Research: High TE Courses

This study took place in the context of a **physical science course for elementary education majors**. The course covers fewer topics in more depth, including astronomy, energy, and light and color. The course pedagogy is best described as a balance of **guided inquiry** and **responsive teaching** [1]. In contrast to physics courses making use of interactive engagement, the responsively taught inquiry course fosters a high degree of engagement that transfers to out-of-school settings.



Data and Methods

Data used for this study included the **written comments** made by students that were included as part of taking a transformative experiences survey (N = 67) and from follow-up **interviews** about students' engagement outside-of-class (N = 10).

The corpus of data was analyzed in a manner consistent with **thematic analyses** [3], identifying themes inductively through multiple passes and then working to establish relationships among themes. A priori assumptions include (i) the researcher's sense that sharing science learning with family and friends is an important marker of students' engagement and (ii) commitment to capturing students' own experience in sharing their science learning (consistent with a **phenomenographic approaches** [4]).

References

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2. Frank, B.W., & Atkins, L.J. 2013 PERC proc. (2104)
3. Braun, V., & Clarke, V. (2006). Qualitative research in psychology, 3(2), 77-101.
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Students relate sharing science learning to self-efficacy and pride

Sharing, Self-Efficacy, and Pride as Themes

- **Sharing knowledge** with family and friends
 "I have also been spreading my knowledge like gospel in my everyday life."
- **Self-efficacy** with respect to specific science content
 "I feel like I am becoming an expert in this and my opinion is valid when the topic comes up, so I love hearing it come up."
- **Pride** related to the hard work they put into achieving that understanding.
 "I was not told about the moon; I figured it out for myself, with the help of my classmates. I worked hard to gain my own understanding."

Relating Sharing, Self-Efficacy, and Pride

"I like that I could successfully talk about the moon to a variety of people and be confident in what I know. I like knowing that information. Not many people really understand the moon and I now can enlighten them.... I think it's because I was invested in our claims and I worked hard to come to the claims that we feel are valid. By doing that, I feel like I am more passionate about what I have learned and I want to share that."

"When you have a better grasp on something, you are going to talk about it. Especially because I could explain the moon and the phases. That's why I really enjoy it. As much as it was hard for me in the beginning, I've really enjoyed it because I can pass on knowledge that I was not just given."

Students describe interlocutors in terms of their interest, capability, and knowledge

Interest, Ability, & Knowledge as Themes

When students described their experiences engaging family or friends, they often described their interlocutors in terms of three dimensions that impacted how students experienced those engagements, including a person's

- **Interest (or disinterest) in science**
 "My friends could care less about the moon and I don't blame them I am the same way."
- **Ability or inability to understand**
 "I don't see my mother understanding. I don't see my mother getting it. My husband is a very smart man. So I knew that if I could talk to him, we would bounce ideas off each other."
- **Knowledge or lack of knowledge of the topic**
 "Yet, he didn't know it. So, it was kind of funny. He didn't realize that the metal really had a filament connected to it. He didn't understand how it was going through, so I actually showed him."

Comparing and Contrasting Sharing Experiences

"I was explaining it to him and he would see if it made sense to him; and it made sense to him, so I knew I could send that paper in, feeling confident. Because he knew nothing about the moon. He thought the shadow theory was like, legit, like everybody else... And, well he's really into science and technology and this kind of stuff, so he actually really appreciates it more than I guess an average person would... He's really into computers, I don't get computers. I mean I get the basic, how to work with them, but he likes to program and do all that kind of stuff. And um, and I think that just kind of, and he really gets biology, and the human body especially. He really just gets everything about it. So I think, the science just kind of, I don't know. He just, it just makes sense to him. So if it makes sense to him, if my paper made sense to him then I was good. I was fine."

A student describes her boyfriend as interested and capable of understanding, but just an unknowledgeable about the moon as everyone else. In contrast, she describes her sister and mom as not understanding and not interested, respectively.

"Then I explained it to my sister, this summer break when I went to go visit her, and she did not get it. I think I was rushing her, but she did not understand it. And um, I think I've tried to explain it to my mom, but she doesn't really care, so it's like, 'Okay mom'... Um, well my mom just, I mean, she likes listening about school, but not in depth. 'As long as you're making good grades, I really don't care.' But that's just her."