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Students' Reactions to a Student-Centered Learning Environment in Relation to Their Beliefs about Teaching and Learning

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With the growing interest in student-centered approaches to learning, it becomes important to look at student learning experiences in the self-directed learning environment as students may feel uncomfortable and unprepared for the demands associated with student-centered learning environments (SCLEs). This qualitative study explored student beliefs about teaching and learning and described how students reacted in a technology-intensive SCLE. The results showed that students' learning experiences in the SCLE resulted in different types of reactions in relation to their beliefs about teaching and learning: match, conflict, confirmation, appreciation, withdrawal, and transformation. This study suggests that teachers and educational practitioners acknowledge individual differences, provide personalized support and guidance, and encourage students to become self-directed learners.

There is a growing interest in student-centered learning approaches, changing the educational paradigm regarding when, where, and how learning occurs, and who plays an active role in learning environments (Wolfe et al., 2013). Wolfe et al. (2013), in their book *Anytime, Anywhere*, state that student-centered approaches align closely with research in brain science and, because of advances in educational technology making personalized learning possible, it is more feasible for teachers to implement student-centered practices in classrooms.

Rooted in constructivist epistemology, student-centered learning approaches focus on the learner's active construction of knowledge and understanding (Baeten et al., 2013; Elen et al., 2007; Hannafin & Land, 1997; Ke & Kwak, 2013; Neumann, 2013). With an emphasis on learning rather than on instruction, student-centered learning focuses on how students learn and how teachers can facilitate learning (Blackie et al., 2010; Wright, 2011). The learner-centered psychological principles of the American Psychological Association assert learning as being active and reflective, and thus emphasize that students should be active in their learning contexts (Alexander & Murphy, 1998).

Student-centered learning is transformative in that it requires reconsideration of both students' and teachers' roles in and their perceptions of learning contexts (Weimer, 2002). In such a learning environment, teachers act as a guide or facilitator, providing students with guidance so that students can find relevant information and useful resources. In this sense, students are viewed as active learners who take responsibility for their own learning. Thus, it is essential for teachers and students to understand the concepts of student-centered learning environments (SCLE) and agree with their roles in SCLEs (Elen et al., 2007). However, students may have different beliefs about or expectations of teaching and learning because they have been taught mostly in teacher-directed learning environments. The difference in beliefs influences student perceptions of SCLEs (Lee & Branch, 2018) and may hinder student participation in learning activities and knowledge construction. Therefore, it is important to understand how students react to SCLEs in relation to their beliefs about teaching and learning.

Student Beliefs about Teaching and Learning

Although beliefs have been regarded as an important topic in education, the term *belief* has not been clearly defined (Pajares, 1992; Pedersen & Liu, 2003). In some cases, for example, belief has been used synonymously with other terms, such as conception and perspective (Pedersen & Liu, 2003). In other cases, the word belief has been used very narrowly, focusing on specific academic content, including beliefs about teaching math and science (Kagan, 1992). Student beliefs about teaching and learning in this study refer to students' implicit assumptions and understandings about teaching, learning, and learning environments (Lee & Branch, 2018). While all students hold a range of beliefs and bring them into the learning context, student beliefs about teaching and learning are tied to the expectations of and attitudes toward teaching and learning (Chan & Elliott, 2004; Fang, 1996). Research has shown that student beliefs influence their own learning approaches, motivations to learn, attitudes toward learning, perceptions of learning environments, and learning outcomes (Edmunds & Richardson, 2009; Lee & Branch, 2018; Rezaei, 2011).

Student beliefs seem to be relatively stable because they have been formed over time, and changes in beliefs about teaching and learning are unlikely to occur easily (Prawat, 1992). However, the findings from Howard and colleagues (2000) imply that epistemology may be less stable than was previously recognized, suggesting that constructivist approaches may bring about epistemological changes. Likewise, constructivist, SCLEs may promote changes in their beliefs about teaching and learning in accordance with the

assumptions of student-centered learning. Once students have positive learning experiences and appreciate student-centered learning, they may change their beliefs to be more consistent with the constructivist approach. In the first part of this study, the authors found that student beliefs interacted with a SCLE, affecting their perceptions of the learning environment (Lee & Branch, 2018). Students' perceptions and their learning experiences may, in turn, be likely to influence their beliefs about teaching and learning.

The purpose of this research was to describe students' reactions to a SCLE in relation to their beliefs about teaching and learning. Although Northcote (2010) acknowledged that student beliefs can be influenced by their learning practices, few studies have looked at how students' learning experiences would influence their beliefs. As different beliefs bring about different perceptions of SCLEs, students' learning experiences in the unique learning environments can impact their beliefs about teaching and learning (Lowyck et al., 2004). Given the new active role of students required in SCLEs, it is essential to understand how their beliefs will be influenced by the unique approach.

Method

Strauss and Corbin (1988) acknowledged that qualitative methods are suitable for studies intended (a) to understand the experiences of people, (b) to explore areas to gain novel understandings, and (c) to obtain rich and detailed information about phenomena. Therefore, a qualitative approach was selected because this study was intended to describe students' learning experience and their reactions to a SCLE in relation to their beliefs about teaching and learning.

This study was conducted in studio courses (see Rieber, 2000), which exemplified a *learning by designing* approach, at a large southeastern university in the United States. The studio courses were considered technology-intensive as students were required to use technology in-depth to learn about technology in their course work (Fulford & Ho, 2002). The studio courses comprised three required courses (beginning, intermediate, and advanced courses) designed to teach instructional design and multimedia development tools, such as Dreamweaver and Photoshop, to graduate students. Instead of teaching how to use the computer tools in a step-by-step manner, the studio courses provided a constructivist learning environment where students could learn various tools and gain knowledge and skills related to instructional design by designing and developing educational artefacts. The studio courses focused on learning in authentic contexts, and students were expected to be active constructors of meaning while the teachers provided scaffolding for knowledge construction and skill acquisition.

A total of 32 students were enrolled in the three studio courses during a regular 16-week semester. Among them, after a brief survey asking student information, 11 students (8 females and 3 males) were purposefully selected with diverse backgrounds in terms of experience in the studio courses, epistemological beliefs, and majors. The participants were interviewed about their beliefs about teaching and learning and their learning experiences two to three times throughout the semester. The first interview focused on initial beliefs of the participants and their initial perceptions of SCLEs. The second and third interviews asked again about their beliefs and perceptions as well as their learning experiences to see if they would change their views. Also, the students were required to write a reflective weekly journal, in which they shared their reflections, beliefs, and understanding about their own learning experiences. The interviews lasted 30 to 60 minutes and were audio-recorded and transcribed for data analysis purposes.

Based on the first interviews, two main categories regarding the initial beliefs about teaching and learning emerged: *teacher-centered* and *student-centered beliefs* (Kember, 2001; Lee & Branch, 2018). The teacher-centered belief category focused on the transmission, acquisition, and retention of new information. The participants with the teacher-centered belief emphasized the role of the teacher and placed the focus on teachers rather than on students and believed that student learning would depend largely on how teachers organize and present information. Selected answers from the students with the teacher-centered belief included "Teaching to me is both a process of imparting knowledge and information from a mentor to a student or a mentor to a mentee" and "The outcome of learning would be to acquire knowledge or information and be able to retain that information and recall it whenever it is needed." The student-centered belief, on the contrary, mainly focused on the roles of students in the classroom. The participants with the student-centered belief regarded teaching as guidance and support on the side rather than one-way instruction from a teacher to students. Some of the examples were "It [Teaching] is about learning together and empowering people to find what they want to do and what they're gifted at or can be gifted at" and "The teacher is supposed to help guide the student, but not necessarily dictate, but be there as a helper to help them and facilitate their learning." Table 1 shows the participants' profiles.

The constant comparative method was used to analyze the interviews (Lincoln & Guba, 1985). Data analysis began with initial coding (Charmaz, 2006) of the interview transcripts and students' reflection journals, followed by the initial categories. The

Table 1
Participants' Profiles

Course	Pseudonym	Age	Beliefs about Teaching and Learning
Beginning	Susan	48	Susan regarded teaching as guidance-providing skills to help students prepare their professional works. She believed that students should be responsible for their own learning.
	Jennifer	23	She regarded teaching as a process of continuous learning. Helping students learn and reach their fullest potential, teachers mutually benefit by continuing to learn and grow professionally.
	Mary	39	She believed that one of the most important tasks for a teacher was not to pass knowledge on to students but to get students to know where and how to find information and resources and how to learn from them.
	Brian	50	He regarded teaching as a process of imparting knowledge and information, helping learners grow and develop their expertise. Thus, teachers should help students expand their knowledge and their perspectives.
	Julie	49	For Julie, the focal point in any learning situations should be placed on students. Julie strongly believed that learning is a student's responsibility and students benefit from learning through hands-on experiences. It is more effective with the responsibility to learn through experience.
Intermediate	Emily	27	Emily emphasized the role of a teacher in learning contexts. As a math teacher, she focused on presenting information in such a way that students could understand it easily.
	Tom	33	Tom's beliefs seemed to be aligned to the teacher-centered belief, but he explained that his teaching practice had been moving toward student-centered learning. He believed that teaching involved imparting knowledge and helping students grow with knowledge.
Advanced	Sara	56	Sara recognized that teaching had varying meanings in different settings and that there are different ways of teaching. She liked to consider teachers as guides on the side who were available to help people learn. She also appreciated individual learning styles, personalities, and interests in various learning contexts.
	Scott	32	For Scott, teaching meant instruction, or providing knowledge and skills. Thus, he considered teachers to be a vehicle for knowledge. Scott believed that teachers should manage and facilitate student learning and growing.
	Beth	27	Beth believed that teaching means helping others transfer knowledge to contexts outside of the classroom. In order to increase transferability of knowledge, students should develop thinking and problem-solving skills. Teachers need to be flexible and accommodating to students' learning styles, personalities, abilities, and individual needs.
	Katie	29	She believed that the aim of teaching is to introduce new information to people and also to get students to ask questions and make them want to know more.

participants' experiences in the studio courses and their beliefs about teaching and learning were compared within and between the categories for the authors to identify students' different reactions to the courses.

Findings

At the beginning of the semester, there were two types of initial reactions in their beliefs and the studio courses: match and conflict. *Match* refers to students' initial perceptions of congruence between their beliefs about teaching and learning and the expectations of the studio courses. After being introduced to the studio approach, the participants with the student-centered belief felt that the studio approach matched their beliefs. The strong case was Julie, who believed that the studio would perfectly match her beliefs about teaching and learning. The teacher-centered belief, on the contrary, conflicted with the assumptions and expectations of the studio courses. *Conflict* refers to the differences between students' initial beliefs and the assumptions and

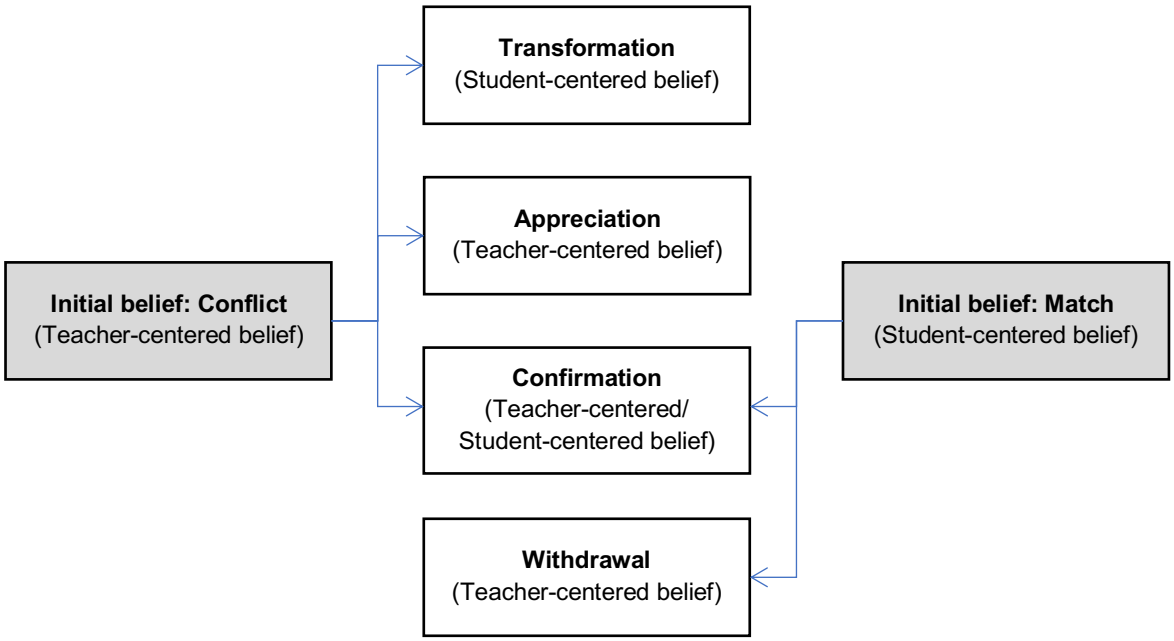
expectations of the studio.

Not all the participants, however, who believed that the studio matched their beliefs enjoyed learning in the courses, nor did all the students holding the teacher-centered belief dislike their experiences in the studio. Their beliefs alone could not explain different perceptions about the courses and their experiences fully. For example, among those holding the teacher-centered belief, some confirmed that their beliefs were valid, but others appreciated the constructivist approach. Likewise, while some students holding the student-centered belief enjoyed the studio approach, others felt frustrated and overwhelmed. Through constant comparison, students' self-efficacy about technology, or beliefs about self-confidence in learning technology, emerged to be important for understanding different experiences and reactions in the studio courses centered around technology learning. In fact, there was a substantive difference among the participants in previous experiences in technology and self-assessment of technical knowledge, and the difference had a significant impact on their experiences in the studio. For example, those who held the student-centered belief and high technology self-efficacy enjoyed learning independently and confirmed their beliefs. Also, students with the teacher-centered belief and high technology self-efficacy were able to adapt to the studio approach and appreciated the new way of teaching and learning. However, students with little background knowledge and skills in computer tools were mostly frustrated in this SCLE. Even students who understood the student-centered learning approach and their expected roles expressed concerns about the lack of support and guidance.

At the end of the semester, students' learning experiences resulted in four different types of reactions in their beliefs as shown in Figure 1: (a) confirmation, (b) withdrawal, (c) appreciation, and (d) transformation. *Confirmation* refers to students' affirmation that their initial beliefs about teaching and learning are valid. The participants with the student-centered belief and a solid background of computer tools enjoyed the self-directed learning in the course. For example, although Mary had not previously experienced SCLEs, she believed that student-centered approaches could engage students more and make learning outcomes last longer. She felt that the studio experience gave her a better understanding of what student-centered learning was, and she came to confirm her belief. Mary said, "I understand it [the student-centered approach] a lot better and I would like to try it in my middle school setting." Similarly, Julie had a challenging yet rewarding experience in the studio. She confirmed her initial belief that the studio "reinforced a lot of my convictions that student-centered learning is definitely superior."

Figure 1

Students' Reactions to the Studio Experience in Relation to Their Beliefs About Teaching and Learning



For those holding the teacher-centered belief, the studio approach was challenging. Although Beth came to understand the approach, her belief that learning in SCLEs would be difficult had been solidified. She was disappointed in the SCLE, believing that she would have learned more in a teacher-directed classroom. Likewise, Emily liked direct instruction in a structured course and felt frustrated and overwhelmed.

Withdrawal refers to the retraction of the initial student-centered belief. It was an alteration of beliefs toward the teacher-centered belief following negative learning experiences. This particularly occurred to those having little skills and knowledge of the computer tools; these students reported having a hard time learning the tools independently. They complained about the lack of support and interaction, had a hard time in the courses, and withdrew their beliefs, thinking that the studio approach did not serve them as well as they had originally thought. Initially, for example, Jennifer had a relatively strong student-centered belief and liked to learn things independently. However, because she had little prior knowledge and skills, she felt that she did not receive any support or help, causing her to feel more frustrated. She said, "Even if I had gone into a course where I didn't know anything, I've never struggled or felt the frustration that I felt with this course." Jennifer came to realize that she would need teacher-directed, step-by-step instruction.

Not all participants who initially experienced the conflict, however, had negative experiences in the studio courses. The participants with strong backgrounds in technology were able to learn the tools independently and appreciated the new approach. *Appreciation* refers to students' recognition of the worthiness of the constructivist approach. Although those with the teacher-centered belief did not change their initial beliefs, they came to acknowledge that the studio approach was also effective and worthy. They saw great potential in the approach and thought that students should be exposed to this different way of teaching. Sara, for example, enjoyed the extent to which she was able to choose what she wanted to accomplish in her course. She appreciated the unique approach and felt that students would need to learn in different ways.

Transformation refers to changes in student beliefs from the teacher-centered toward the student-centered belief. Transformation of student beliefs did not occur easily. It occurred to one student when he overcame difficulties and conflicts that challenged his belief and abilities. The more that students are challenged and frustrated, the more possibility there is for them to change their beliefs once they overcome the difficulties. In this study, Brian had a relatively strong teacher-centered belief and expected to be "a vessel that was going to get filled with all this new knowledge" at the beginning of the semester. Despite his strong technology-related skills, due to the lack of direction and support, he struggled and felt that he was not prepared for the studio approach. He described his struggles as a "tsunami" experience and even considered dropping the course:

> It felt like a tsunami had hit me with my new role of, essentially, finding my own way with curriculum materials and course goals. It was overwhelming to me. I would concur that this was a dramatic shift in roles from the classical teacher-student relationship I was used to in an academic environment.

However, after discussing the issue with the instructor and sharing his experience with other students, he realized that he could succeed in the course and that "it's not going to be a failure." After having the studio experience, Brian mentioned, "It turned out, interestingly enough, to match my style a lot more closely than I thought it would." Brian came to believe that teaching is working with students, instead of transferring knowledge onto students, and that students should have some flexibility in their own learning process. He described the studio approach as an "enriching and eye opening" course, and finally became a proponent of the approach:

> I'm a huge proponent of it now. I wasn't so much early on, I didn't know anything before I came into the course but if I were teaching, this would likely be the kind of course I would want to teach maybe as opposed to a more teacher-centered course so I'm a big fan of it.

Brian felt that his confidence level in the SCLE had increased, and he would be less afraid next time with this type of learning experience. However, he felt that he should have basic subject knowledge and skills to be successful in SCLEs.

This study showed that the studio courses allowed students to better understand the student-centered approaches and their roles in the SCLE. Most participants appreciated the new approach and believed that they became more adaptive to different types of learning environments, which is a necessary skill for lifelong learners. Table 2 presents how student beliefs about teaching and learning as well as their technology self-efficacy were associated with their learning experiences and reactions to the courses.

Implications

This study was conducted in technology-intensive graduate courses. Furthermore, because of the nature of qualitative research with the small number of participants, this study did not intend to generalize its.

Table 2
Students' Learning Experiences and Their Reactions to the Studio Courses

	Technology Self-efficacy	
	Low	High
Student-centered belief	*Match - Withdrawal* A student had difficulty learning the new computer programs without step-by-step instruction. A withdrawal from the student-centered belief occurred without appropriate support and guidance. (Jennifer)	*Match - Confirmation* The students had a great learning experience, enjoying much freedom and self-directed learning in the studio. They confirmed their student-centered beliefs. (Mary, Susan, Katie, & Julie)
Teacher-centered belief	*Conflict - Confirmation* The students wished to learn the computer tools in teacher-led classrooms. They confirmed their teacher-centered beliefs. (Beth & Emily)	*Conflict – Appreciation* Although the students had difficulty learning in the studio initially, they were able to adapt to the approach. They came to appreciate the new approach to teaching and learning. (Sara, Tom, Scott) *Conflict - Transformation* A transformation of the beliefs occurred when a student experienced and overcame the hardship. (Brian)

results to other populations across disciplines; therefore, the results of this study should be interpreted accordingly.

Student beliefs have been formed throughout their life, thus changes in their beliefs may not occur easily. However, this does not mean that the beliefs are static and remain the same over periods of time. Beliefs about teaching and learning can evolve as students experience new learning environments. This study found that students' learning experiences resulted in different reactions to a technology-intensive SCLE. Findings from this study indicated that successful implementation of a SCLE was highly related to how and when support and guidance should be provided for student learning. The following are recommendations for teachers and educational practitioners when they consider the design and implementation of SCLEs.

Individual Differences

Students bring different aptitudes, preferences, and motivations, and they learn at different paces. Different student profiles interact with the learning environment and bring about different learning outcomes (Hinton et al., 2013). Therefore, student-centered learning begins with knowing and understanding students, and teachers should accommodate individual differences. The findings of this study showed that students' technology self-efficacy varied, bringing about different learning experiences in technology-intensive courses. Emphasizing the analysis of students' current knowledge and skills is nothing new. The primary reason for understanding individual differences in SCLEs, however, is to provide support and guidance tailored to the different characteristics of students.

Personal Support and Guidance

One of the common misconceptions about student-centered, self-directed learning is that there may be less teacher input in these types of classes than in teacher-led classes because of the student-centeredness and the focus on self-directed learning. However, SCLEs require more input from teachers in different ways. For example, for students who lack prior knowledge and skills and are not good at taking ownership of their learning, SCLEs may not be effective (Clark, 2000). For some students, learning by viewing can be faster and more effective than learning by doing (Stull & Mayer, 2007), and they may have different levels of readiness for SCLEs, particularly in technology-intensive courses. In some cases, teachers may need to provide well-structured, teacher-led instruction of basic knowledge and skills when students do not have the prerequisites and do not know how to begin their own learning. Tailored support and guidance can optimize students' learning experiences in SCLEs.

Gradual Transition

A transition from teacher-centered to student-centered approaches will be successful only when teachers and students understand the concepts of SCLEs (Elen et al., 2007). Students may want to remain teacher-dependent, and it will take time for students to become self-directed learners. Considering that student-centered learning responds to individual differences and needs, teachers should help students transition their roles into self-directed learners when they are in learning contexts that are unfamiliar to them (Grow, 1991). Introduction to the ideas of SCLEs at the early stage of these types of courses, as well as frequent communication, may help students understand their expected roles and the goals of those courses.

Teachers should also provide opportunities for students to understand their beliefs about teaching and learning and encourage them to reflect on the beliefs. Encouraging self-reflection about their beliefs and their learning experiences, for example, allows students to make their beliefs explicit, understand the idea of student-centered learning, and appreciate different ways of teaching and learning. Self-reflection makes learning more meaningful to students, allowing students to understand their roles and experiences and to transform their roles accordingly (Mezirow, 1991).

Conclusion

One of the main goals of education is to empower people to be self-directed, lifelong learners who can continue developing themselves as whole persons. Teachers and educational practitioners need to encourage students to become independent, autonomous learners by changing the learning context to being more student-centered. Along with the overt knowledge and skills that students knew were being covered in studio-like courses, there was a *hidden curriculum* (Snyder, 1971). The hidden curriculum of SCLEs is to encourage students to become self-directed learners. Students learning through this new approach are expected to be independent from teachers and to take responsibility for their own learning. Therefore, it is important for teachers and instructional designers to understand and respond to students' different beliefs, thereby encouraging and facilitating self-directed learning. Future research should examine student beliefs and their learning experiences in SCLEs in other disciplines with more diverse student populations.

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