Journal of Effective Teaching in Higher Education

Learner-Centered Design: Is Sage on the Stage Obsolete?

Sheri Stover, Ph.D. Wright State University
Sharon G. Heilmann, Ph.D., Wright State University
Amelia Hubbard, Ph.D., Wright State University

Abstract. This quantitative research study examined one instructor's redesign of her introductory Anthropology course (N = 265) from Teacher-Centered (TC) to Learning-Centered (LC) and the resulting impact on her students' perceptions of Teaching Presence (TP), Social Presence-Interaction (SP-I), Social Presence-Participation (SP-P), Cognitive Presence (CP), and Satisfaction (SAT). Using the Community of Inquiry (CoI) survey (Swan et al., 2008) in a face-to-face classroom environment; results indicated that implementing a LC classroom compared to a TC classroom was found to have a significantly positive impact on students' perceptions of TP (p = .021), SP-I (p < .001), SP-P (p < .001), CP (p = 002), and SAT (p = .022). Multiple regression results indicated that TP, SP-I-, and SP-P were able to predict 42% of students' level of satisfaction score with TP having the highest level of prediction (β=.37). Preliminary evidence suggests that instructors who implement LC teaching methodologies can have a positive impact on TP, SP-I, SP-P, CP, and SAT.

Keywords: Learner-centered, Community of Inquiry, Teaching Presence, Social Presence, Cognitive presence

Faculty in higher education are educated to be content experts upon graduation, yet few college professors take pedagogically-oriented classes or get experience on the best methods to convey their content expertise to their students (Fertig, 2012). As a result, teacher-centered (TC) instruction is the most dominant form of instruction with more than half of faculty reporting a heavy reliance on lecture in "all" or "most" of the courses (Eagan et al., 2014). TC instruction can be defined as a classroom teaching methodology that is designed so that the instructor is the person primarily in charge of providing direct instruction or lectures to a passive student audience with little input from the students (Weimer, 2013a).

Scholarship on Learning-Centered (LC) instruction suggests that such approaches have many academic benefits including increased student retention and better preparation post-graduation (Matlin, 2002; Sternberg & Grigorenko, 2002). LC instruction can be defined as learning that requires students to become active learners where they become more responsible for their own knowledge creation (Weimer, 2013a). While there are benefits to a LC course design, faculty may feel nervous about moving away from a TC methodology, which can change the dynamics of classroom structure and create fear among faculty that such shifts may lead to poor student course evaluations (Carrell & West, 2010; Braga, Paccagnella, & Pellizzari, 2014). Therefore, before faculty change teaching models, it is important to determine whether such a change has any effect.

[1] Corresponding author's email: sheri.stover@wright.edu

Using the framework of the Community of Inquiry (CoI), this study explores the effects of switching from a TC to LC model on students' perceptions of Teacher Presence (TP), Social Presence (SP), Cognitive Presence (CP), and Satisfaction (SAT) in a large introductory Anthropology course. The instructor for this course subscribed to the belief that, "Education's role is to challenge inequality and dominant myths rather than socialize students into the status quo. Learning is directed toward social change and transforming the world, and 'true' learning empowers students to challenge oppression in their lives" (Stage, Muller, Kinzie, & Simmons, 1998, p. 57). To meet this educational goal the instructor, like others (Eagen et al., 2014), opted to redesign her course from Teacher-Centered (TC) to Learning-Centered (LC) in an effort to allow students to take more control of their own academic development with the expectation that such a change would improve students' perceptions of TP, SP, CP, and SAT.

Literature Review

The foundation for LC teaching is built upon the social constructivism theory, which was developed by Lev Vygotsky (1978). Vygotsky was a cognitivist who felt that students needed to be more responsible for constructing their own knowledge, and therefore could not passively listen to an all- knowing instructor's lecture. Vygotsky also argued that learning cannot be separated from a social context so that students must be part of a learning community. He felt that learning is a collaborative process where students can have higher levels of development (zone of proximal development) with the help and support of teachers and peers.

LC classrooms need to be designed with collaborative learning methodologies where students have opportunities to work together. Further, LC classrooms need to be designed so that activities are complex and relevant, authentic, require social negotiation, encourage multiple perspectives, require students' ownership of learning, and encourage self-awareness of knowledge construction (Reynolds & Kearns, 2017). In a LC classroom, students take more responsibility for their own knowledge creation. LC learning environments allow students to work collaboratively in a community of inquiry with the other participants in the class to help negotiate meaning of the course content, diagnose existing misconceptions, and challenge any currently held biases to move toward deeper and more meaningful learning outcomes (Garrison, 2011; Vega & Tayler, 2005).

In a TC classroom, the teacher is the sole leader and the person taking the active role in presenting lectures. The students 'primary job in the classroom is to listen and to take notes (Rogers & Frieberg, 1994). However, in LC classrooms, learning is the responsibility of the group who form a community of inquiry. Garrison (2011) defines a community of inquiry as "a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding" (p. 15). The Community of Inquiry (CoI) is a theoretical framework that emphasize the need for effective educational experiences to include high levels of the three interdependent elements of Teaching Presence (TP), Social Presence (SP), and Cognitive Presence (CP). TP can be defined as "the design, facilitation and direction of cognitive and social processes

for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Garrison, 2011, p. 24). SP can be defined as "the ability of participants to identify with a group, communicate purposefully in a trusting environment, and develop personal and affective relationships progressively by way of projecting their individual personalities" (p. 23). The final CoI element, CP can be defined as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry" (p. 24).

Students' perception of teaching presence may change when a class moves toward a LC design. Students' attention is focused on the instructor in the TC classroom because the instructor is the "centerpiece of instruction" (McCarthy & Anderson, 2000, p. 279). The instructor's role in a TC classroom is to be the expert who disseminates information to students usually using a lecture teaching methodology. Students have had years of experiences with TC learning environments and have come to believe it is the responsibility of the instructor to take control of the teaching (Howard & Baird, 2000). The advantage of teachers maintaining the expert role is the respect given by students for sharing their expertise in class lectures. The disadvantage of teacher as expert is that students rely on the instructor to disseminate information and can be intimidated to take ownership of their own knowledge creation (Roberson, 2014). The instructor's role changes in a LC classroom. Knowledge creation is no longer the sole responsibility of the instructor, and students become partners in their own knowledge creation. Wood (1994) found that students go through all the steps psychologists associate with trauma when they are forced to assume more control of their learning. They will go through shock, denial, strong emotion, resistance and withdrawal, surrender and acceptance, struggle and exploration, return of confidence, and integration and success.

Students' perception of social presence may also be impacted when moving toward a LC design. Students have few opportunities to interact with other students in TC classrooms as most instruction is direct lecture transmitted from the instructor. In a LC classroom, the class works collaboratively as a community of inquiry (Garrison, 2011) to help each other make sense of what they are learning (Brophy, 1999). Lipman (2003) discusses the power of having students work as a community of inquiry because students can build on each other's ideas and can help each other to draw inferences. Lipman identifies some of the class characteristics when students work as a community of inquiry to include inclusiveness, participation, shared cognition, relationships, quest for meaning, feelings of social solidarity, deliberation, challenging, reasonableness, questioning, and deciding. There have been many research studies to show the benefits of students working collaboratively to include social benefits (social support, building diversity, developing learning communities), psychological benefits (increased self-esteem, reduced anxiety, positive attitude toward instructors), and academic benefits (promotes critical thinking skills, actively involves students in the learning process, classroom results improved, models problem solving, personalizes large lectures, increased student motivation) (Laal & Ghodsi, 2011).

Implementing a LC classroom can have an impact on students' cognitive presence. LC classrooms are designed so students are more actively involved in their own learning and have opportunities to reflect and regulate their learning, so this results in more effective learning (Lambert & McCombs, 2000) Research has shown that students who have higher personal involvement in their own knowledge creation have higher levels of personal commitment and confidence which leads to higher levels of student achievement (Alexander & Murphy, 2000). Bandura (1963) developed the Social Learning Theory, where he posits that learning can only take place in a social context where students have an opportunity to observe and then model behaviors. Therefore, LC teaching has a positive impact on students' cognitive development.

The adoption of LC teaching methodologies may also have an impact on students' level of satisfaction. LC education can increase students' levels of satisfaction due to having more control over their own learning (Alexander & Murphy, 2000). However, not all students react well to LC teaching methodologies. By the time students come to higher education, many have a fixed mindset toward TC classrooms where they view the students' role as passively taking notes, listening to lectures, reading the course material, and taking tests. In a TC classroom students mostly work along and only seek the instructor if they have questions or issues (Doyle, 2008). Howard and Baird (2000) found that some students resist becoming active participants in a LC classroom because they feel they are the paying customer and the instructor is the one being paid to provide the information. Weimer (2014) suggested that students resist group work because they do not value the input of other students, and only value the faculty member because he/she is considered the expert knowledge provider. Instructors may be hesitant to incorporate LC teaching strategies such as group work into their classes due to issues such as free riding where only a few members do most of the work (Brooks & Ammons, 2003), social loafing where the group exerts less work than they would individually since they feel a reduced accountability (Kao, 2013), and conflict when group members cannot work together due to personality issues (Taylor, 2011). Students may report disliking group work because it requires students to do the hard work instead of passively listening to the instructor. Students may resent being required to struggle through the material instead of having it spoon-fed to them by the instructor. They may also dislike being accountable to their group members which means they will need to complete group prep work and cannot sleep during class (Taylor, 2011).

Research Hypothesis

This research study examines the impact of one instructor's redesign of her introductory Anthropology course from TC to LC. This study will examine the impact that the redesign from TC instruction to LC instruction had on her students' perceptions of Teacher Presence (TP), Social Presence-Interaction (SP-I), Social Presence-Participation (SP-P), Cognitive Presence (CP), and students' level of satisfaction (SAT).

H1: Students perception of Teaching Presence (TP) will be positively impacted by a Learner Centered (LC) course design.

H2: Students perception of Social Presence-Interaction (SP-I) will be positively impacted by a Learner-Centered (LC) course design.
H3: Students perception of Social Presence-Participation (SP-P) will be positively impacted by a Learner-Centered (LC) course design.
H4: Students perception of Cognitive Presence (CP) will be positively impacted by a Learner Centered (LC) course design.
H5: Students level of satisfaction (SAT) will be positively impacted by a Learner Centered (LC) course design.
H6: Students' perceptions of Teaching Presence (TP), Social Presence-Interaction (SP-I), Social Presence-Participation (SP-P), and Cognitive Presence (CP) will positively impact students' perceptions of Satisfaction (SAT) such that increased TP, SP-I, SP-P, and CP will have a corresponding, positive increase in perceptions of students' SAT correlation in predicting students' SAT.

Methodology

Participants

The participants in this study were enrolled in an introductory Anthropology class at a medium sized Midwestern university. While there were 265 students enrolled in these classes; absenteeism, opting out, or incomplete surveys resulted in 143 completed surveys, for a 54% response rate. Students identified as female (n = 76), male (n = 62) and other (n = 1). The majority of students were in the 18-24 range (n = 117), with other students in the age ranges of 25-30 (n = 7), 31-40 (n = 5), 41-50 (n = 2), and 50+ (n = 3). Most participants described themselves as Caucasian (64.3%), Other (15.7%), Black/African American (10.7%), Asian (5.7%), and Hispanic/Latino (3.6%). Students identified themselves as Freshman (33.3%), Sophomore (31.1%), Junior (17%), and Senior (18.5%). There were 11.8% of the students who reported being an international or foreign national student.

Class Structure

The professor teaching these classes participated in a year-long learning community designed to help her learn how to redesign her classes from passive TC format to a LC active-learning format. A researcher, other than the course instructor, observed a class during the 2015 Spring term, the 2015 Fall term, and the 2016 Spring term. The outside researcher took detailed notes by scripting class activities and documenting times for activities. The scripted class activities were then coded by the researcher into TC or LC activities. TC activities were those activities where the instructor was almost entirely in charge and usually conducting a lecture. The LC activities were those activities where the student was primarily in charge by completing activities such as a quiz or group project. Activities where there was a group discussion where all were participating were equally divided between TC and LC.

Table 1: Class Descriptive data

Class	*Term*	*N*	*Teacher-Centered*	*Learner-Centered*
Class #1	2015 Spring	99	82%	18%
Class #2	2015 Fall	72	32.5%	67.5%
Class #3	2016 Spring	94	38%	62%

Class #1 Spring 2015: This class was taught in a fixed-seat auditorium style classroom. The class was designed with primarily a TC design where the instructor conducted her classes showing PowerPoint slides accompanied by an instructor lecture. Students were passive learners for the majority of the class as their primary role was to listen to the instructor lecture and take notes. Most of the class was instructor lecture, and there was some opportunity for interaction with instructor questions and clicker polls.

Class #2 Fall 2015 and Class #3 Spring 2016: These classes were taught in a classroom specifically designed to support active learning activities. These classes were primarily taught in a LC design where the responsibility of learning was shared with the students. Students sat in groups of six at a round table where each student had his or her own laptop. The classroom was equipped with whiteboards throughout the classroom to allow group work; software on the laptops to permit active learning activities such as polling, quizzing, etc.; software on the computers that permitted the instructor to display individual and group work; software on the computers that permitted the instructor to manage and monitor all classroom computers; and a swipe system to monitor class attendance. The instructor completely redesigned her class toward more LC instruction where students were actively engaged throughout the class. The instructor conducted short min-lectures, and students would apply their knowledge many times during class by completing individual quizzes, group quizzes, group problem-solving at the whiteboards, group work, individual assignments, polling questions, class questions, and other activities.

Instrument

Students in this research study were given a survey that included the Community of Inquiry (CoI) survey (Swan et al., 2008) Then CoI framework was originally developed to guide research in online learning environments (Garrison, Anderson, & Archer, 2000). However, since the CoI attempts to measure learning environments that "support discourse and reflection in a community of inquiry" (Arbaugh et al., 2008), the survey was consistent with the goals of this research study and was chosen to utilize for this research study. The CoI survey was slightly modified to be administered to students so it was appropriate for a face-to-face classroom environment (see Appendix A). Swan et al. (2008) validated that the CoI survey appropriately measured for the three factors of Teaching Presence (TP), Social Presence (SP), and Cognitive Presence (CP) when delivered in an online learning environment. Stover and Ziswiler (2017) used the CoI survey in a research study conducted in a face-to-face learning environment that was conducted with students in 7 different classes with 417 students. Stover and Ziswiler conducted an

Exploratory Factory Analysis (EFA) with principal axis factoring and varimax rotation on the data gathered from results of the CoI survey to reduce the number of questions and determine the number of factors (Norris & Lecavalier, 2010). Items with a primary factor load of .4 or below and items with higher than a .32 cross-loading were removed (Tabachnick & Fidell, 2012). The Stover and Ziswiler (2017) EFA resulted with two different factors for the SP. One SP group (Q14, Q15, Q16) pertained to questions about students interactions in the class, so this factor was renamed Social Presence-Interaction (SP-I). The other SP group (Q17, Q18) pertained to questions about students participation in the class, so this factor was renamed Social Presence-Participation (SP-P). The EFA also resulted in a reduction of questions. Therefore, the revised four factor groupings and the reduced number of questions in each factor were used to analyze the data for this research study as depicted in Table 2.

Table 2: CoI survey item groupings after factor analysis

Teaching Presence TP	Social Presence Interaction SP-I	Social Presence Participation SP-P	Cognitive Presence CP
Q1	Q14	Q17	Q32
Q2	Q15	Q18	Q33
Q3	Q16		Q34
Q4			
Q5			
Q6			
Q8			
Q9			
Q13			

Note. Adapted from Stover, S. E., & Ziswiler, K. (2017, in press). Impact of active learning environments on community of inquiry. *International Journal of Teaching and Learning in Higher Education (29)*3.

The survey administered to the students in this research study also included a student satisfaction questionnaire. The semantic differential technique (Osgood, Suci, & Tannenbaum, 1957) was used so that the students were asked to select between 15 sets of bipolar adjectives (for example, Anxiety or Security) to express their feelings while participating in the class. Eight students outside the class enrollees were given a mixed up list of adjectives and asked to select the bipolar opposites. Results indicated 100% agreement on 7 terms, 87.5% agreement on 5 terms, 75% agreement on 1 term, and 62.5% agreement on 2 terms. Exploratory factor analysis (EFA) with principal axis factoring and varimax rotation was used to identify the underlying relationships between the student satisfaction adjective items (Norris & Lecavalier, 2010). In an effort to identify one group of adjectives to represent a student satisfaction, items were removed until all remaining items had a primary factor load of .4 or above and did not have any cross-loading of higher than .32 to ensure adequate item communalities (Costello & Osborne, 2005). After removing those items that did not meet the specified criteria, eight items bi-polar adjective remained to represent the factor of student satisfaction as shown in Table 3.

The survey was given to students during the final week of the academic semester and was administered by a researcher other than the instructor to ensure students' anonymity. Students completed the scantron survey and results were tabulated and saved to an Excel spreadsheet that was exported to SPSS for analysis.

Table 3: Student survey items after factor analysis

Items	Factor load
1. Dissatisfaction – Satisfaction	.90
2. Defeat – Success	.85
3. Lack of confidence – Confidence	.84
4. Anxiety – Security	.81
5. Confusion – Clarity	.80
6. Frustration – Well Being	.77
7. Disconnected - Connected	.75
8. Bored - Excited	.67

Bi-polar adjectives scored by students using a seven-point semantic differential technique

Results

The revised CoI Survey factors and revised Student Satisfaction (SAT) survey items were used to compare classes for TP, SP-I, SP-P, CP, and SAT. The Cronbach Alpha scores indicated good to excellent levels of consistency (DeVellis, 2012) for TP (α = .90), SP-I (α = .80), SP-P (α = .83), CP (α = .84), SAT (α = .93). Shapiro-Wilk's test ($p < .05$) (Razali & Wah, 2011) and a visual inspection of their histograms, normal Q-Q plots and box plots indicated the TP, SP-I, SP-P, CP, and SAT scores did not appear to be normally distributed. Therefore, the Kruskal-Wallis non-parametric method was used for analysis to compare TP, SP-I, SP-P, CP, and SAT scores between classes.

H1 Teaching Presence (TP)

A Kruskal-Wallis H test showed that there was a statistically significant difference in TP scores between the three classes, χ^2 (2) = 9.180, p = 0.01, with a mean rank TP score of 68.35 for Class #1, 62.66 for Class #2, and 87.82 for Class #3. Post hoc tests were conducted to evaluate pairwise differences among the three groups. The results of these tests indicated a significant difference between Class #1 and Class #3 (p = .021) and Class #2 and Class #3 (p = .004). Therefore, the LC classroom appeared to have a positive impact on students' perception of TP for Class #3. See Table 4 for all hypotheses results.

H2 Social Presence: Interaction (SP-I)

A Kruskal-Wallis H test showed that there was a statistically significant difference in SP-I scores between the three classes, χ^2 (2) = 26.742, p = .000, with a mean rank SP-I score of 49.28 for Class #1, 76.30 for Class #2, and 93.19 for Class #3. Post hoc tests were conducted to evaluate pairwise differences among the three groups. The results of these tests indicated a significant difference between Class #1 and

Class #2 (p = .001), a significant difference between Class #1 and Class #3 (p = .001p cannot be 0), and a significant difference between Class #2 and Class #3 (p = .028). Therefore, the LC classroom had a positive impact on students' perception of SP-I for Class #2 and Class #3.

Table 4: Class impact on TP, SP-I, SP-P, and CP

Class	*N*	Mean Rank	Class	*N*	Mean Rank	χ^2	eta^2	*p*
Teaching Presence								
Class #1	49	53.27	Class #2	52	48.87	.570	.006	.45
Class #1	49	40.08	Class #3	42	52.90	5.352	.059	.02*
Class #2	52	40.30	Class #3	42	56.42	8.155	.088	.004*
Social Presence-I								
Class #1	49	40.62	Class #2	52	60.78	12.163	.122	.001***
Class #1	49	33.65	Class #3	42	60.40	23.593	.262	.001***
Class #2	52	42.02	Class #3	42	54.29	4.812	.052	.021*
Social Presence-P								
Class #1	49	45.11	Class #2	52	56.55	4.003	.040	.05*
Class #1	49	35.94	Class #3	42	57.74	15.966	.177	.000***
Class #2	52	41.00	Class #3	42	55.55	6.917	.074	.01**
Cognitive Presence								
Class #1	49	49.54	Class #2	52	52.38	.239	.002	.63
Class #1	49	38.30	Class #3	42	54.99	9.148	.102	.01**
Class #2	52	40.91	Class #3	42	55.65	6.882	.074	.01**
Satisfaction								
Class #1	38	43.72	Class #2	52	46.80	.305	.003	.58
Class #1	38	33.84	Class #3	41	45.71	5.281	.068	.02*
Class #2	52	42.07	Class #3	41	53.26	3.948	.043	.05*

*Significant at < 05 level; **Significant at $\leq$ .01; ***Significant at <.001

H3 Social Presence: Participation (SP-P)

A Kruskal-Wallis H test showed that there was a statistically significant difference in SP-P scores between the three classes, χ^2 (2) = 17.473, p = .001, with a mean rank SP-P score of 56.05 for Class #1, 71.05 for Class #2, and 91.79 for Class #3. Post hoc tests were conducted to evaluate pairwise differences among the three groups. The results of these tests indicated a significant difference between Class #1 and Class #2 (p = .045), a significant difference between Class #1 and Class #3 (p = .001), and a significant difference between Class #2 and Class #3 (p = .009). Therefore, the LC classroom appeared to have a positive impact on students' perception of SP-P for Class #2 and Class #3.

H4 Cognitive Presence (CP)

A Kruskal-Wallis H test showed that there was a statistically significant difference in CP scores between the three classes, χ^2 (2) = 10.536, p = .005, with a mean rank CP score of 62.84 for Class #1, 66.79 for Class #2, and 89.14 for Class #3. Post hoc tests were conducted to evaluate pairwise differences among the three groups.

The results of these tests indicated a significant difference between Class #1 and Class #3 (p = .002), and a significant difference between Class #2 and Class #3 (p = .009). Therefore, the LC classroom appeared to have a positive impact on students' perception of CP for Class #3.

H5 Student Satisfaction

A Kruskal-Wallis H test showed that there was a statistically significant difference in Student Satisfaction scores between the three classes, χ^2 (2) = 6.219 p = .045, with a mean rank Student Satisfaction score of 58.07 for Class #1, 62.37 for Class #2, and 77.96 for Class #3. Post hoc tests were conducted to evaluate pairwise differences among the three groups. The test did indicate a significant difference between Class #2 and Class #3 (p = .047) and then also between Class #1 and Class #3 (p = .022). Therefore, the LC classroom had a positive impact on Student Satisfaction for Class #3.

H6 Prediction of Students Satisfaction Level

A multiple stepwise regression was computed in order to evaluate students' level of satisfaction based on their perception of TP, SP-I, SP-P, and CP. Results indicated an adjusted R^2 of 42%, a moderate to large size effect according to Cohen (1988). The multiple regression model statistically significantly predicted satisfaction level, F(4, 129) = 32.430, p < .0001, adj. R^2 = .420. Three of the four variables (TP, SP-I, SP-P) added statistically significantly to the prediction, p < .001. Regression coefficients and standard errors can be found in Table 5. As depicted in Table 5, TP (β=.37) was the most significant contributor in the model. TP, SP_P, and SP_I accounted for 42% of the explained variance, and CP was excluded from the stepwise regression computation. All Betas for the remaining variables were statistically significant at the p < 05 level.. Further, collinearity indices, variance inflation factor, and tolerance indicators all met rule-of-thumb requirements, indicating the model was not significantly impacted by collinearity (Best & Wolf, 2015).

Table 5: Summary of Linear Regression with Stepwise Entry

Predictor	ΔR^2	β
Step 1	.29	
TP		.54**
Step 2	.39	
TP		.42**
SP-P		.35**
Step 3	.42	
TP		.37**
SP-P		.24*
SP-I		.22*
Total *adj* R^2	.42**	
N	131	

*p < .01; **p < .001

Discussion

The goal of this research paper was to examine the impact of a redesign from TC to LC instruction on students' perceptions of TP, SP-I, SP-P, CP, and SAT. Implementing learner-centered instructional strategies requires many instructors to change their teaching paradigms and to redesign their classes to shift more of the responsibility of learning to the students. Students may resist moving to a LC design due to the requirement of increased cognitive efforts, student dependency on instructors doing most of the work, and resistance to working with other students (Tolman & Kremling, 2017). Instructors worry switching to a LC class format may result in lower student evaluations due to student resistance to the LC design. In order for instructors to begin to adopt LC teaching philosophies, they need to have training and support while redesigning their classes. The instructor for these introductory Anthropology courses joined a year-long learning community facilitated by the university learning teaching center that helped teach her strategies about redesigning her class for more LC active-learning methodologies. The training helped her redesign her class from the TC design in Class #1 to the LC design in Class #2. The redesign of her courses resulted in an increased in students' perception of CP and SAT and also increases in SP-I and SP-P at significant levels.

While the instructor was teaching Class #2, she asked a teaching assistant (TA) to take notes for any issues or concerns with each class that were brought up by class participants and observed by the TA. These TA observations led to the instructor making about 100 tweaks to the class before she taught Class #3. None of these TA observations resulted in changes to entire activities but more minor modifications to instructions and directions to add clarity or to clear up confusion that was noted during the previous class.

The instructor again taught the Anthropology class using the LC design for Class #3 during the 2016 spring term. While the activities and class structure remained the same as Class #2, the suggestions by the TA during the previous term resulted in clearer instructions and directions for class activities. These updates were noticeable by students and resulted in less confusion by the students. Class #3 resulted in improved scores at significant levels from Class #1 in TP (p = .021), SP-I (p =<.001), SP-P (p < .001), CP (p = .002), and SAT (p = .022), as indicated in Table 4. While the class activities remained almost exactly the same from Class #2 to Class #3, the instructor tweaks and clarifications resulted in improved scores from Class #2 to Class #3 at significant levels in TP (p = .04), SP-I (p = .028), SP-P (p = .009), CP (p = .009) and SAT (p = .047), depicted in Table 4. Since the course activities, course assignments, and course assessments remained the same from Class #2 and for Class #3, it can be argued that the significant increases in TP, SP-I, SP-P, CP, and SAT may be impacted by the instructor's course redesign. It also shows that implementing the class designed with learner-centered principles may take a semester of teaching the same course before the instructor has mastered the new teaching philosophies and make improvements to course activities. The changes implemented by the instructor for her third time teaching

resulted in improvements in students' perceptions of TP, SP-I, SP-P, CP, and SAT at significant levels, as depicted in Table 4.

Instructors that wish to move from a TC to a LC design will reformat their courses so that students are required to take more responsibility for their own learning. This means students will be the ones to do their own knowledge creation instead of coming to class and passively listening to instructor lectures. Instructors can hold students accountable for completing course assignments by requiring students to complete assessments at the start of each class with activities such as clicker questions or learning management system (LMS) quizzes. Students can use their cell phones to respond to clicker questions or complete LMS quizzes if they are in large auditorium classrooms without access to laptop computers. Incorporating educational technologies such a clickers and LMS quizzes allow assessments to be implemented in large classes due to the immediate automated grading capabilities that can provide immediate feedback to students. The inclusion of frequent assessment activities allows students to take more ownership of their own learning because it gives them frequent feedback about their learning progress so they can learn from their mistakes (Blumberg, 2015). Instructors can include LC activities during class by conducting short mini-lectures and then include case studies where students are required to work together to apply the course concepts to solve problems. The case studies should not have one correct answer, but be open-ended responses that empower students to construct their own meaning to solve the problem (Blumberg, 2015).

Instructors that do not have access to robust course redesign workshops may need to develop other support structures. Faculty can connect with other like-minded colleagues on campus to create their own learning community. The advantage of creating a faculty learning community is to share best practices, share support resources, and brainstorm ideas to overcome obstacles. Faculty can also attend an academic conference focused on teaching and learning to come away with strategies for LC class design.

While LC instruction requires students to become more actively involved in their own knowledge construction, it does not diminish the role of the instructor or make them obsolete. The instructor is working just as hard (and probably harder) before each class to design class activities, build quizzes, structure group projects, and other LC activities. The instructor also continues to conduct short min-lectures during class to provide meaning, add context, provide instruction, and clarify any misconceptions. The instructor also needs to continue to update the LC activities to make modifications when students are confused, make the activities more productive and effective, and keep them updated. The instructor's role changes in LC classrooms, but the instructor's presence continues to have a substantial influence on students' perceptions of SP-I, SP-P, and CP. Therefore, when designing LC classrooms, the design should always start with the instructor, and the importance of keeping the instructor involved in the learning process should not be forgotten. The LC model allows faculty and students to work together more interactively instead of limited interaction in a lecture environment.

Weimer (2013b) points out that academics tend to see teachers as either having a philosophy of TC with lectures (currently considered bad) or a LC teacher who actively engages students (which is now considered good). Instead of believing that TC instruction is juxtaposed against LC, perhaps a combination of both teaching philosophies can have the biggest impact on students' learning. Instructors can include short mini-lectures when they need to intervene and set boundaries to allow students to make choices and assume more responsibility of their own learning. Cox and Yearwood (2014) make the case that teachers are multifaceted individuals and feel that students need to know instructors not only as course designers, but also as sages who push students to develop deeper and more critical thinking skills. Perhaps the best mode of instruction is to have a combination of TC and LC instruction.

Faculty have terminal degrees in their discipline area and often do not have many opportunities to take courses in effective course design. Faculty may be nervous about receiving poor student evaluations with LC course designs (Carrell & West, 2010; Braga et al., 2014) due to negative perceptions caused by changes in instructor roles, increased requirements for more group work, impact on students' beliefs on knowledge creation, and decreased levels of satisfaction because of increased requirements to take control of their own learning. These results support the expectations that, in this course, the instructor's redesign to LC teaching methodologies had a positive impact on students' perceptions of TP, SP-I, SP-P, CP, and SAT. The results also show that we cannot forget the importance of the instructor on students in these areas as the multiple regression analysis showed that the presence of a teacher had the largest impact on students' level of satisfaction. While students assume more responsibility for their knowledge creation in LC classrooms, the presence of the instructor continues to have a substantial impact on students' level of satisfaction.

Study Limitations and Further Areas of Study

It is impossible to have perfectly controlled conditions in a live classroom. Conducting research in an authentic educational classroom opens up the research study to commonly occurring fluctuations that cannot be controlled such as technology issues, lack of control of student enrollment, term influences (fall, spring), external influences (politics, current events), and a plethora of other issues that instructors are faced with every day while teaching their classes. These fluctuations certainly have an impact on students' perceptions of TP, SP-I, SP-P, CP, and SAT. However, it is critical that research studies are conducted live classrooms to measure students' perceptions of design change in authentic environments. The data were gathered at one mid-western, mid-sized institution that has 96% acceptance rates. Therefore, it is unknown if the educational preparation or willingness to change for the students in this research study had an impact on their perceptions; therefore, the results cannot be generalized to other locations. Further research involving control and experimental groups is warranted.

The CoI Survey was originally designed for use in online classroom settings. Stover and Ziswiler (2017) conducted a factor analysis on data from a study in a face-to-

face classroom using the Community of Inquiry (CoI) survey (Swan et al., 2008). The factor analysis resulted in only 17 of the 34 questions meeting the guidelines for an Exploratory Factor Analysis. Instead of the three original factors identified in the CoI for delivery in online settings, the factor analysis identified one additional factor when implemented in face-to-face classroom settings. The questions on the CoI needed to be slightly modified to be appropriate for a class in a face-to-face teaching environment. Therefore, there need to be additional studies on the modified version of the CoI Survey to evaluate its validity in face-to-face classroom environments.

While the results of this research study cannot be generalizable, these data provide preliminary evidence that faculty wishing to migrate from TC to LC teaching methodologies can have a positive impact on their students' perceptions of TP, SP-P, SP-I, CP, and SAT. An additional area of research could be evaluating the impact of the LC classroom on students' learning, drop rates, and impact on minority students.

Conflicts of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article.

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Appendix A

Table A1: CoI survey with revised questions

Teaching Presence
1. *The instructor clearly communicated important course topics.
2. *The instructor clearly communicated important course goals.
3. *The instructor provided clear instructions on how to participate in course learning activities.
4. *The instructor clearly communicated important due dates/time frames for learning activities.
5. *The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. *The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. *The instructor helped keep the course participants on task in a way that helped me to learn.
9. *The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses.
13. *The instructor provided feedback in a timely fashion.
Social Presence
14. *Getting to know other course participants gave me a sense of belonging in the course.
15. *I was able to form distinct impressions of some course participants. **Revised:** I was able to form distinct impressions (ideas, feelings, or opinions) of some course participants.
16. *Online or web-based communication is an excellent medium for social interaction. **Revised:** Class Discussions are an excellent tool for social interaction.
17. *I felt comfortable conversing through the online medium. **Revised:** I felt comfortable talking during class.
18. *I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration. **Revised:** Class discussions help me to develop a sense of collaboration.

Cognitive Presence
23. Problems posed increased my interest in course issues. **Revised:** Course problems and activities increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.
26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives. **Revised:** Class discussions were valuable in helping me appreciate different perspectives.
29. Combining new information helped me answer questions raised in course activities. **Revised:** Applying new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.
32. *I can describe ways to test and apply the knowledge created in this course.
33. *I have developed solutions to course problems that can be applied in practice.
34. *I can apply the knowledge created in this course to my work or other non-class related activities.

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
*Questions remaining after factor analysis
(Swan, Richardson, Ice, Garrison, Cleveland-Innes, & Arbaugh, 2008)