Exploring Constructivist Perspectives in the College Classroom

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Abstract

The study used Explanatory Sequential Design (ESD) of Mixed-Methods to investigate college students' and instructors' perspectives of constructivist learning environment (CLE). Students, including graduates and undergraduates from a Midwestern university, rated their preference for personal relevance, collaboration, negotiation, and autonomy as key learning experiences embodied in CLE. Results indicated that undergraduates were more likely than graduate students to prefer collaboration and negotiation experiences. Expanding on the results of students' quantitative ratings, students' and instructors' perspectives of collaboration were explored. Eight participants (four students and four instructors) participated in one-on-one interview sessions. Themes that emerged from the qualitative analysis showed that the differences in students' preference for collaboration related to students' perceptions of unequal opportunities to collaborate, perceived benefits, and diverse backgrounds and orientations. In addition, conditions necessary for effective collaboration in the college environment were explored. Thematic analysis produced three themes: understanding collaboration process; monitoring, assessment, and evaluation system; and group composition. Implications for practice in the college classroom have been discussed.

Introduction

Postmodernity and its epistemological implications for knowledge and its acquisition have informed a range of learning theories that provide frameworks for enhancing students' active engagement. Constructivist frameworks of learning, along this trajectory, have become significant in most pedagogical decisions across different levels of education. The constructivist paradigm posits that all knowledge and meaning are contingent upon human practices and experiences (Crotty, 1998). In the college classroom, instructors and students' conceptions of constructivism shape the pedagogical landscape by framing their respective understanding of the nature of truth and their role expectations.

A growing body of literature aligns the constructivist learning environment (CLE) with the promotion of active student engagement anchored in a range of experiences, including metacognitive activities, collaborative learning, problem-based activities, higher order thinking, and authentic learning experiences (Gijbels, van de Watering, Dochy, & van den Bossche, 2006; Jonassen, 1994; Jonassen, Peck, & Wilson, 1999; Loyens, Rikers, & Schmidt, 2008; Sherman & Kurshan, 2005; Tenenbaum, Naidu, Jegede, & Austin, 2001). Within the higher education context, a myriad of theoretical traditions (e.g., Perry's, 1970, intellectual development model; Knowles's, 1980, andragogy-theory of adult learning; Mezirow's, 2000, transformational learning framework; and Baxter Magolda's, 1999, self-authorship and learning partnership models, etc.) illuminate frameworks that demonstrate a shift from the traditional notion of knowledge acquisition to the conception of the construction of multiple realities. The instructional implications of these models appear consistent with the assumptions inherent in constructivism (Jonassen, 1991), with emphasis on students' responsibilities and initiatives in determining learning goals and the regulation efforts toward achieving such goals (Mara, 2005).

Creating CLEs requires instructors to meaningfully integrate their understanding of students' conceptions and preferences in such a learner-centered environment (Kember, 2001; Mara, 2005). In addition, a consideration of instructors' own epistemological beliefs, conceptions, and perceptions about CLEs is critical, given the extent to which they act as facilitators in such a learning environment. Although several researchers (e.g., Loyens et al., 2008, 2009; Mara, 2005; Swan, 2005; Wang, 2009) have investigated various conceptions of CLE in the college environment, less is

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known about students' perceptions of constructivism in the context of their own preferred learning experiences. To expand researchers' understanding of constructivism in the college environment, the study investigated college instructors' perceptions of CLE and students' preferred learning experiences embodied in such contexts.

Conceptual Framework

Learning Paradigms

Varying philosophical perspectives have drawn increased attention to contrasted beliefs about the nature of knowledge and truth. These disagreements are generally extrapolated from researchers' epistemological and ontological positions regarding what knowledge is and how it can be acquired (Jonassen, 1999; Vrasidas, 2000). While some researchers reject the dichotomy of these philosophical traditions into positions (Cronjé, 2006; Jonassen, 1999; Renkl, 2009), others conceptualize them as learning paradigms that fall on a continuum (Carswell, 2001; Vrasidas, 2000), with the objectivist and the constructivist traditions marking the opposite ends of that continuum. For the purpose of the study, the researcher focused on the objectivist and the constructivist learning paradigms.

The objectivist tradition. The objectivist tradition is rooted in the philosophical belief that an objective reality exists outside the mind of the individual (Lakoff, 1987; Swan, 2005; Vrasidas, 2000). Instructors who ascribe to this underlying epistemological position use external stimuli to change the behavioral and the cognitive structures of learners toward mastering the content of the learning task (Fosnot & Perry, 2005). Consistent with the objectivist tradition, instructional strategies focus on transferring the "objective knowledge" to the learner through strands of activities perceived to be independent of the learner (Jonassen, 1999; Vrasidas, 2000). Vrasidas (2000) argued that most traditional methods of learning and teaching ascribed to the behavioristic and cognitive theories share philosophical assumptions that are fundamental in objectivism. These methods emphasize the role of memorization of facts, replication of content and structure, and the prescription of a series of steps that learners have to follow in the process of knowledge acquisition (Jonassen, 1991). Students acquire knowledge by learning a defined body of knowledge within instructor-prescribed boundaries, while instructors' role is to identify the course objectives required of students and then systematically arrange the content to reach those objectives (Carwile, 2007). While the objectivist cast focuses more on documenting changes in students' behavior and cognitive schemes, with limited emphasis on meaning-making (Vrasidas, 2000), its usefulness in the context of student learning is significant (Jonassen, 1999).

The constructivist tradition. Constructivism speculates that knowledge does not exist independent of the learner, but constructed by the learner (Moallem, 2001). Constructivism offers a more contemporary perspective that learning is an active process and that the learner is an active agent in the process of knowledge acquisition. Thus, students actively participate in the meaning-making process so that " . . . the knowledge they construct is not inert, but rather usable in new and different situations" (Jonassen, Davidson, Collins, Campbell, & Haag, 1995, p. 11). Within the individual learners' minds are the schemata that interpret events, objects, and perspectives based on their own cognitive and social experiences (Jonassen et al., 1995). While proponents of constructivism share the view of the existence of the real world, however, they argue that learners cannot fully understand the real world in a single way but in multiple ways (Jones & Brader-Araje, 2002; Piaget, 1970; von Glasersfeld, 1995; Vygotsky, 1978). Consistent with this claim, constructivists emphasize that classroom experiences should encourage multiple perspectives (Jonassen et al., 1995; Vrasidas, 2000).

Dewey (1938), Piaget (1970), Vygotsky (1978), and Bruner (1996) are few examples of the pioneering works that have laid the foundations for contemporary understanding of constructivism. Jean Piaget's cognitive development theories and the social constructivist perspectives of Lev Vygotsky have had the widest influence on the emerging and the contemporary perspectives on constructivism. A review of Piaget (1964, 1972), Vygotsky (1978, 1981), and other contemporary scholarships (e.g., Fosnot & Perry, 2005; Knight & Sutton, 2004; Tudge & Winterhoff, 1993) reveals a number of differences between the cognitive development and the social constructivist perspectives. Piaget's and Vygotsky's theoretical positions knit together significant intellectual foundations beyond their mere categorizations (Tudge & Winterhoff, 1993). Consistent with this view, the researcher's theoretical position was guided by both the tenets of the cognitive development theory, as well as the social constructivist perspectives.

Cognitive Development Theory

The study of cognition regarding the nature of knowledge and knowing became an important area for Piaget at the time when behaviorists' ideas about learning were widespread (Swan, 2005). From behaviorists' point of view, learning means a systematic change in human behavior in response to physical stimuli. With this fundamental understanding, educators use reinforcement, practice, and external motivation to influence the behavior patterns of learners (Fosnot & Perry, 2005). Opposite to this perspective, Piaget (1964, 1970) drew attention to the changes that occur within the internal mechanisms of cognition and how such changes can influence the process of meaning-making. Piaget (1964) maintained that

[T]o know an object is to act on it . . . [T]o know is to modify, to transform the object, and to understand the process of this transformation, and as a consequence to understand the way the object is constructed. (p. 20)

Knowledge development, according to Piaget (1964), is underpinned by what he termed "operational structures" (p. 20). He specified these structures as follows: sensory-motor stage (infancy), pre-operational stage (toddler and early childhood), concrete operations (elementary and early adolescence), and formal operations (adolescence and adulthood). Therefore, to understand the process of knowledge development is "to understand the formation, elaboration, organization, and functioning of these structures" (Piaget, 1964, p. 20). Transitions across these stages are marked with qualitative changes in successive order (Tudge & Winterhoff, 1993). According to Piaget (1964), these changes are mediated by a host of factors, including maturation, experience, social, or linguistic transmission, and what he called *equilibration*. Piaget (1964) used the term *equilibration* to explain the process of self-regulation toward achieving a balance between two intrinsic polar behaviors of assimilation and accommodation. Thus, according to Piaget, to know an object or an event involves active processes of assimilation and accommodation. The former relates to how learners translate incoming information into a form that they can understand, and the latter denotes how individuals adjust their current knowledge structures in response to new experience (Tudge & Winterhoff, 1993).

Social Constructivism Theory

Social constructivism provides a frame that shifts emphasis from the individual construction of knowledge to a view of collectively constructed meaning (Sivan, 1986). Although Piaget theoretically related development and knowledge to the internal changes, Vygotsky (1978) focused on the external changes, with an emphasis on cultural contexts mediated by language and other symbolic systems. According to Vygotsky (1978), the means by which culture and knowledge are transmitted influence the way learners think, act, and the meaning that they make. Social constructivist theorists posit that " . . . culture provides the context in which the tools and signs (e.g. language and numbers) and knowledge (a body of affective and cognitive information available to an individual) are shaped" (Sivan, 1986, p. 214). Language is viewed as a tool of thought and cognitive activity. For Vygotsky (1978), development and learning are not achieved by learners in an equal measure; therefore, there is always a qualitative gap between these dynamic processes, which he terms this gap the zone of proximal development. Thus, the zone of proximal development

   . . . is the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more peers . . . (Vygotsky, 1978, p. 33)

Tudge and Winterhoff (1993) argued that the zone is created in the course of social interaction. For Vygotsky, the nature and the form of historical developments in any given culture influence a number of experiences, including thinking, literacy, numeracy, and art which are also embedded in that culture (Tudge & Hogan, 1997).

Knowledge Construction in the College Environment

The mechanism of meaning-making by students is a dynamic process mediated by multiple experiences and structures in a given learning context (Jonassen et al., 1995). The consideration of Piaget's cognitive development theory and Vygotsky's social constructivist perspectives highlights frameworks that conceptualize learning as a dynamic activity situated in a unique physical, cognitive, social, and a cultural context. Students construct knowledge through their active engagement in their physical, social, cultural, and mental environments (Swan, 2005; Wang, 2009). Specifically, the intersection of these two theoretical dimensions accentuates the role of individuals' cognitive structures, as well as the social and the cultural milieu in the process of meaning-making (Fosnot & Perry, 2005).

The cognitive context. Piaget's model of cognitive developmental progression informs a frame of understanding that learning as a developmental process is an interplay between the structures of the mind and the knowledge that students construct. Learners build their knowledge structures by discovering and transforming information, checking new information against old, and by revising rules when they no longer apply (Loyens et al., 2008). Students make sense of their own experiences by building and adjusting their knowledge structures that collect and organize perceptions and reflections (Swan, 2005). Even though Piaget's theory was originally developed to explain the cognitive organization of how children and young adolescents come to know and construct new perspectives of their environment (Fosnot & Perry, 2005), its pedagogical relevance has been extended to the college classroom. Specifically, the cognitive development perspectives of Piaget remain significant foundations of the neo-Piagetian perspectives (Labouvie-Vief, 1992; Sutherland, 1999). The extension of Piaget's ideas in the study of adult cognitive development has shown that young and older students demonstrate varying functional and optimal levels of cognition in their abstraction of ideas and their ability to access at optimal levels (Knight & Sutton, 2004).

Perry's (1970) scheme of intellectual development describes nine progressive stages through which college students navigate during their intellectual development. Perry's scheme has informed a number empirical and theoretical works and educators' understanding about how college students' epistemological beliefs in the meaning-making process shift from a dualistic view to an understanding that one can approach a situation from different perspectives, and to

the development of a personal opinion, acknowledging that all knowledge and ideas are relative (Loyens et al., 2009). However, several other researchers (e.g., Baxter Magolda, 1992; Belenky, Clinchy, Goldberger, & Tarule, 1997) have observed that Perry's scheme is limited in accounting for a broader demographic representation of students because it was developed based on interviews with students of Harvard University who are predominantly of White middle-class. Kember (2001) examined students' beliefs about the process of teaching and learning in the college classroom by drawing from the assumptions that students bring to class a set of beliefs about the nature of knowledge, a conception of learning, and a belief about how teaching should take place. Kember argued that these beliefs constitute a major factor in the degree to which students are able to cope with learning. While the study concludes that the set of beliefs about knowledge, learning, and teaching is a fundamental factor in determining how well students cope with learning, it failed to address how these beliefs and conceptions of students are incorporated into the instructional decisions.

Several other researchers (see Harrington & Enochs, 2009; Loyens et al., 2008, 2009; Tenenbaum et al., 2001) investigated students' conceptions of the CLE using quantitative scales. For instance, Loyens et al. (2009) investigated students' conceptions of constructivist learning using quantitative measures of students' knowledge construction, cooperative learning, self-regulation, use of authentic problems, self-perceived inability to learn, and motivation to learn. In this cross-sectional study, the researchers found a significant difference in the questionnaire's scores between Year 1 and Year 2 (but not between Year 2 and Year 3) regarding students' conceptions about knowledge construction, self-regulation, and the use of authentic problems, but not for cooperative learning and motivation to learn. Based on the results, the authors concluded that differences in students' conception of knowledge construction, self-regulation, and the use of authentic problems can be observed between students who enter a new learning program and students who already have 1 year experience in higher education. Similarly, Tenenbaum et al. (2001) used a quantitative survey to investigate the presence of constructivist principles in the face to-face and in open and distance learning (ODL) environments within higher education. Their results indicated seven components of constructivist teaching and learning: arguments, discussions, and debates; conceptual conflicts and dilemmas; sharing ideas with others; materials and measures targeted toward solutions; reflections and concept investigation; meeting student needs; and making meaning and real-life examples. Although the generalized results of these studies have added to the growing literature in the field, they fail to provide in-depth understanding about how the background experiences of students affect their conceptions of CLE and what learning experiences students might prefer in such a learner-facilitated learning environment.

Mara (2005) was one of the few inquiries that used a qualitative method to examine the impact of the design of CLEs on college instructors' epistemological belief systems and how instructors' epistemologies might be affected by engaging in CLE design. Based on the themes that emerged from the data analysis, Mara concluded that instructors who were in a zone of "readiness" for intellectual growth could experience epistemological growth from this experience. However, Mara's study does not address how the instructors' epistemological beliefs influence their understanding and their pedagogical decisions in the CLE.

The social context. The social dimension of learning has become an important component in different learning environments, including online and face-to-face experiences (Moallem, 2003). In the adult learning environment, Vygotsky's social constructivist framework draws attention to the mediating role of the sociocultural context in which teaching and learning are situated. Specifically, Vygotsky's constructivist perspectives illuminate frameworks that help to explain how learners' construction of knowledge is influenced by the sociocultural landscape of the learning environment. From Vygotsky's perspectives, knowledge is the outcome of the mechanism of individuals' social, as well as cultural, experiences. Drawing from this perspective, researchers consider learning as a social process in which learners collaboratively construct knowledge through interactive processes of information sharing, active participation, negotiation, and modification (Gunawardena, Lowe, & Abderson, 1997; Swan, 2005; Wang, 2009).

Social learning takes the form of group projects, whole class discussions, collaboration, and cooperative learning experiences (Wang, 2009). Although constructivists differ on how peer learning, including collaborative learning, contributes to knowledge acquisition, they seem to speculate a shared understanding that social design of CLE facilitates construction of social relationships, social negotiation, and social interactions (Greeno, Collins, & Resnick, 1996; Loyens et al., 2008). Collaborative and cooperative learning experiences allow students to construct a shared understanding by negotiating appropriate meaning and solutions to learning tasks (Jonassen et al., 1995). Osterholt and Barratt's (2010) examined the use of collaborative learning as a tool to address social and emotional inhibitors that have the potential to impede beginning college students' successes. The authors found that central to creating a collaborative-facilitated environment are the instructors' knowledge and competencies to guide, model, and provide critical thinking opportunities for students as they learn and apply collaborative skills. Notwithstanding, Osterholt and Barratt's scope of the study was limited to beginning college students, failing to account for broader demographic dynamics.

McDuff (2012) compared students' comments, reflections, and evaluations in traditional and collaborative

learning classes and reported increased student active engagement and interest in the collaborative learning environment, compared with the traditional classroom environment. Chapman and van Auken (2001) used a path-analysis model to examine the role of college instructors in influencing students' attitudes, perceived benefits, and work and grade equity concerns regarding group activities. The authors found that students were more likely to have positive attitudes about group work if they had instructors who discussed group management issues (e.g., group dynamics) and used methods to evaluate individual performance within the group (e.g., peer evaluations). However, because both studies used quantitative measures to investigate students' attitudes and perceptions, they provide limited depth of understanding about how educators can use their understanding of group dynamics to provide enough accommodation for different learning styles when assigning group projects.

In sum, extant literature demonstrates that different aspects of students' and instructors' conceptions of the CLE have been studied in the college environment. While several conclusions drawn from these studies have provided a breath of knowledge, they do not fully address the multidimensional nature of the CLE (Jonassen et al., 1995; Taylor, Fraser, & Fisher, 1997). Thus, knowledge about students' perceptions of their preferred learning experiences in a CLE is limited. The consideration of this gap informed the scope of the current study.

Method

The study used Explanatory Sequential Design (ESD) to investigate college students' and instructors' perceptions of CLE. Consistent with the design, data were collected in two phases. First, the researcher collected and analyzed results of quantitative data (Quantitative phase) and then followed-up with an in-depth qualitative study for possible explanations to the quantitative results (Qualitative phase; Creswell & Plano Clark, 2010). Specifically, the researcher used the follow-up explanation model where the qualitative phase expanded on the quantitative results to offer a better understanding of the outcome (Creswell & Plano Clark, 2010; Ivankova, Creswell, & Stick, 2006).

Quantitative Phase

The purpose of the quantitative phase of the study was to investigate college students' preferred learning experiences embodied in the CLE. Specifically, the first phase of the study was guided by the following research question:

> **Research Question 1:** Do graduate and undergraduate students differ in their perspectives of their preferred learning experiences in constructivist contexts?

Sample

The questionnaire was administered to a sample of 150 undergraduate (75%) and 50 graduate (25%) students drawn from a Midwestern university. Participants included 165 (82.5%) females and 35 (17.5%) males. Their median age was 20 years (range = 18-64). More than half of the participants were White (75%), followed by Black/African American (15%), Hispanic/Latino (5%), American Indian/Alaska Native (2.5%), and Asian/Asian American (2.5%).

They were enrolled in different programs, including education (106), nursing (30), occupation therapy (36), and communication disorders (28) during fall 2014.

Procedure

Participants were given paper and survey designed to collect demographics and perceptual information on students' preferred learning experiences. The survey was administered in six different classroom settings during regular class sessions. In some cases, the instructors teaching the courses administered the survey. However, to minimize the potential for students to feel coerced to participate in the survey, participation was voluntary and completely anonymous. Instructors were blinded to the identity of the participants. In addition, no conditions such as earning extra credit were attached to participation. In all cases, participants had the same instructions, and they returned the completed survey to either the researcher or the instructor. Participants independently completed the questionnaire, which took approximately 8 min. Of the 220 surveys that were administered, a total of 200 were completed for a response rate of 89%.

Measures

Using Piaget's cognitive theory, Vygotsky' social constructivism, and conceptual perspectives (Jonassen et al., 1995; Taylor, Fraser, & Fisher, 1993, 1997) as lens, 20 items were designed to measure students' preference for personal relevance, collaboration, negotiation, and autonomy in their learning experiences. However, the constructs were named after performing principal components analysis (PCA). The four constructs constituted the dependent variables, and students' level of education which was dichotomized into two levels (graduate and undergraduate) represented the independent variable.

Personal relevance. The measure of personal relevance scale dealt with students' perceived preference for opportunities to relate learning experiences to their own personal and learning needs. Five items were included in this construct, with each item measured on a 6-point Likert-type scale (*strongly disagree* = 1, *strongly agree* = 6). Internal consistency (Cronbach's α) of this scale was .70.

Collaboration. The collaboration construct measured students' perceived preference for opportunities to work with other students to accomplish group tasks (Johnson, Johnson, & Stanne, 2000). This construct consisted of four items measured on a 6-point Likert-type scale (*strongly disagree* = 1, *strongly agree* = 6). Internal consistency of this scale was .85.

Negotiation. The negotiation scale assessed the perception of students' preference for opportunities to interact and negotiate meaning and build consensus by explaining and modifying their ideas in contexts of other students' ideas (Taylor et al., 1993). The scale was determined by three items measured on 6-point Likert-type scale (*strongly disagree* = 1, *strongly agree* = 6). Internal consistency (Cronbach's α) of this scale was .65.

Autonomy. The measure of autonomy related to students' preference for opportunities to exercise some degree of control over their learning experiences and to think independently of instructors and other students (Taylor et al., 1993). Five items measured the scale of student autonomy. Participants rated each item on 6-point Likert-type scale (*strongly disagree* = 1, *strongly agree* = 6). Internal consistency (Cronbach's α) of this scale was .74.

Data Analysis

Descriptive statistics were performed to explore variations and the overall distribution of study variables. Two negatively worded items were reverse coded. To analyze the construct validity, PCA was conducted using maximum likelihood extraction with varimax rotation (Pallant, 2011). This gave a four-factor structure that explained 44.9% of the systematic covariance among the items. These factors reflected different dimensions of constructivism and using theoretical and conceptual understandings, they were named as personal relevance, collaboration, negotiation, and autonomy. Included items had loadings >0.30 on the factor and were considered relevant in the conceptual category. Only factors with eigenvalues >1 were retained. The internal consistency reliability of each scale was determined, and Cronbach's alpha coefficients were reported. Three items not fitting any of the four factors were dropped and excluded from further analysis. Pearson correlation matrix was performed to determine the extent to which the subscales covaried. To assess the association between the independent variable (level of education) and the factors, Univariate *T* tests were performed. Mean values were presented and statistical significance was determined at $p < .05$.

Results

Examination of histograms and box plots, as well as skewness (−1.0 to +1.0) and kurtosis (−1 to 0) values, indicated that the sample was normally distributed, and there were no extreme outliers (Tabachnick & Fidell, 2001). Overall, participants' preference patterns were above the mean score. This indicated that students' preference for autonomy, personal relevance, negotiation, and collaboration in their learning experiences were generally high. Descriptive statistics (Tables 1 and 2) show mean scores and standard deviations for individual items and the factors.

PCA with factor loadings which yielding four factors (autonomy, negotiation, collaboration, and personal relevance) is shown by Table 3. The inter-correlation coefficients were positive and showed statistically significant relationships among all factors. However, collaboration and negotiation factors demonstrated the strongest correlation ($r = .42$, $p < .001$). All correlations were significant at α = .01 level. Correlation matrix has been reported with Cronbach's alpha reliability coefficients in Table 4. Results of the Univariate *T* analysis indicated that graduate and undergraduate students significantly differed in terms of their preferences for collaboration and negotiation. Specifically, undergraduate students reported significantly higher levels of preference for collaboration and negotiation, with relatively small effect sizes. The results (see Table 5) suggested the extent of shared commonalities between the concepts of negotiation and collaboration. The results of the quantitative phase motivated the exploration of perceptions that might explain the preferential differences between graduate and undergraduate students in terms of collaboration and negotiation learning experiences. A consideration of an expansion on the quantitative results allowed the researcher to explore other conditions or factors that might be important in making collaboration effective in the college classroom. These conclusions informed the qualitative phase of the study.

Qualitative Phase

Purpose and research questions. With the qualitative phase, the follow-up explanation model was used to explain and expand on the quantitative results (Creswell & Plano Clark, 2010; Ivankova et al., 2006). The purpose of the qualitative phase was to explore students' differential preference patterns toward social learning. Specifically, as *collaboration* being an umbrella term (Smith & MacGregor, 1999), shares conceptual commonalities with negotiation (Osterholt & Barratt, 2010). Based on this understanding, the second phase of the study focused on collaboration. This phase explored how differences in graduate and undergraduate students' preferences for collaborative experiences were a reflection of both student and instructor perspectives and classroom experiences. The study also explored conditions that were essential for creating collaborative learning experience in the college environment. Specifically, the study was guided by two main research questions.

Table 1. Student Preference for Autonomy, Personal Relevance, Negotiation, and Collaboration in Their Learning Experiences
(6 = *Strongly Agree*, 1 = *Strongly Disagree*) Mean and Standard Deviation.

Survey questions	M	SD
Autonomy		
1. I prefer lessons that provide opportunities for me to exercise control over my own learning experiences.	4.5	0.9
2. I rather prefer that instructors allow students to construct their own understanding.	4.1	0.9
3. I would rather prefer to learn to follow instructors' methods of investigating problems.[a]	4.5	1.0
4. I prefer to set my own learning goals in the classroom.	4.4	0.8
5. I like it when I have to determine my own learning pace.	4.6	1.0
Personal relevance		
1. I prefer lessons that offer practically relevant information.	5.3	0.8
2. I prefer lessons that relate ideas to real-life situations.	4.9	0.9
3. I understand new concepts better when they relate to my background experience.	5.1	0.8
4. I prefer to acquire knowledge that is useful in everyday life.	5.0	0.8
5. I do not like to learn things that are irrelevant to my everyday routines.	5.3	0.8
Negotiation		
1. I prefer having other students explain concepts to me than professors.	2.9	1.1
2. I like it when other students challenge my ideas.	4.1	0.9
3. I prefer to know the perspectives of other students in my class.	4.0	1.2
Collaboration		
1. I prefer lessons that are driven by group discussions.	4.4	1.2
2. I learn better when engaged in group activities with other students.	4.2	1.4
3. Group activities make me a better learner than individualized activities.	3.9	1.4
4. I would rather prefer individual-based inquiries than group activities.[a]	3.4	1.3

[a]Item that was reverse coded.

Table 2. Mean and Standard Deviation of the Dependent and Independent Variables.

Variables	M	SD
1. Age undergraduates	20.1	2.0
2. Age graduates	30.1	10.6
3. Autonomy	22.4	3.2
4. Personal relevance	25.7	2.8
5. Negotiation	11.0	2.5
6. Collaboration	15.8	4.3

Note. Descriptive statistics (Table 1) show two levels of the independent variables and the four factors that were used as dependent variables in the Univariate *T* tests analyses.

Research Question 2: How are college students' preferential differences in collaboration reflected in students' and instructors' perceptions of collaboration?
Research Question 3: What conditions are necessary for creating collaborative learning environment in the college classroom?

Participants

The participants were college students and instructors from a Midwestern university. Student participants had enrolled in various courses during the fall 2014 semester. Instructor

Table 3. Factor Loadings for the Constructivist Learning Experiences Survey.

Item	Autonomy	Personal relevance	Negotiation	Collaboration
a_8	.59			
a_19	.54			
a_22	.77			
a_24	.50			
a_29	.71			
pr_q3		.46		
pr_12		.63		
pr_15		.75		
pr_25		.62		
pr_26		.55		
ng_14			.76	
ng_16			.45	
ng_20			.64	
cl_7				.55
cl_11				.87
cl_18				.85
cl_21r				.82
% variance	11.3	8.8	5.0	11.2
Eigenvalue	5.4	2.5	1.4	3.0

Note. N = 200 college students. The factor loadings produced four factors (autonomy, negotiation, collaboration, and personal relevance). Three items were dropped.

Table 4. Correlation of Subscale Constructs and Measures of Internal Consistency.

Subscale constructs	1	2	3	4	α
1. Collaboration	—				.85
2. Personal relevance	.20**	—			.70
3. Negotiation	.42**	.29**	—		.63
4. Autonomy	.30**	.36**	.33**	—	.74

**p < .05, two-tailed.

participants taught courses during the fall 2014 semester. In all, eight participants (four students and four instructors) volunteered to participate in the qualitative phase. Table 6 provides a summary of participants' background information.

Procedure

The selection of student participants was open to instructors and students. However, consistent with the framework of the ESD, the researcher purposefully selected students and instructors who might provide useful discussions to the concept of collaboration (Maxwell, 2005). There were no specific exclusionary criteria for participant selection, except that participants had to be either currently teaching (instructor participant) or enrolled in at least one course during the fall 2014 (student participant). These courses included both online and face-to-face. Student participants who participated in the quantitative survey volunteered to participate in a follow-up qualitative study. Email correspondences with prospective participants, including instructors, were used at all stages of the recruitment process.

Data Collection

All the eight participants were engaged in two sessions of one-on-one interview, lasting approximately 45 min at each session. Participants were asked semi-structured questions with follow-up questions. All interview sessions were audio-recorded which allowed the researcher to take notes and guided participants into areas of more depth. All participants were assigned pseudonyms. This was to identity participants' quotes and comments for appropriate referencing. Using phenomenological lens (Charmaz, 2011), the researcher aimed at learning about participants' understanding of collaboration from their own perspectives, without any preconceived structure or concepts imposed on participants' perspectives.

Data Analysis

The researcher began the data analysis process with the transcription of all tape-recorded data from both faculty and student interviews. The researcher studied the transcripts and generated initial codes. The researcher further organized and examined the codes to identify similar phrases, relationships

among variables, and common patterns that were emerging. A consistent study of the common patterns and the relationships that had emerged allowed for further organization of the data into categories and themes. The researcher made some assertions based on the themes that emerged with composite descriptions of the phenomena (Creswell, 2013). The researcher triangulated qualitative data with the quantitative data which allowed for a broader understanding and also informed accurate and a complete account of the data collected (Maxwell, 2005). Thus, the qualitative findings were corroborated with the quantitative results.

Findings

Students' and Instructors' Perspectives of Collaboration

First, the researcher explored how the differences in college students' preference for collaboration reflected in the way students and instructors perceived collaboration. Second, the researcher explored conditions that might allow for effective collaboration in the college classroom. With the first part, three main themes emerged from the analysis of the qualitative data: opportunities for collaboration, perceived usefulness, and students' background and orientations.

Opportunities for collaboration. The findings indicated that undergraduate and graduate students seemed to have different range of opportunities to engage in collaborative activities. Nick who taught both graduate and undergraduate courses disclosed that undergraduates have more opportunities to work in small groups. However, it was found that graduate students' level of engagement in collaboration was relatively lesser than, perhaps, expected. As Gifty, a graduate student, indicated:

> I think collaboration learning is important in graduate education and should be used more often than it is being used because a lot of people come from different backgrounds with different ideas, different work experiences, and sharing that really helps other students who may not have had the experience to work in certain places . . . but it is not being used as much.

A different dimension to this finding was the indication that graduate students seemed to have different level of expectations for collaboration learning. The findings also showed that graduate students expected varied ways of collaboration. "I have always been grouped with someone so there has always been collaborative thing going on which is good, but I want something different and unique in collaboration and not the same old way of group work," Charity shared.

Perceived usefulness. Both students and instructors perceived collaboration as an important learning experience for social and community skill development, building relationships and networking, establishing a system of support, and encouraging

Table 5. The Comparisons Between Undergraduates and Graduates.

		Undergraduate	Graduate		
Construct category	Larger number means higher preference for . . .	M	M	p	d
Personal relevance	personalized learning experiences.	25.9	25.2	.14	0.01
Autonomy	exercising degree of control.	23.1	22.9	.20	0.01
Negotiation	negotiating with other students to modify understanding.	12.0	11.2	.01	0.03**
Collaboration	engaging in group activities.	16.3	14.4	.01	0.04**

**p < .05.

Table 6. Instructor and Student Participants' Background Information.

Participants	Sex	Race	Age	Status	Program/teach	Year of teaching/program
1. Nick	Male	Caucasian	48	Instructor	Undergraduate	8 years
2. Joel	Male	Hispanic	31	Instructor	Graduate	3 years
3. Nash	Male	Caucasian	36	Instructor	Undergraduate	2 years
4. Tasha	Female	Caucasian	42	Instructor	Undergraduate	15 years
5. Gift	Female	African	35	Student	Graduate	2 years
6. Dan	Male	Caucasian	20	Student	Undergraduate	2 years
7. Dove	Female	Caucasian	19	Student	Undergraduate	1 year
8. Charity	Female	African	34	Student	Graduate	3 years

multiple perspectives. Dove indicated, "When you interact with others and keep going back and forth with other people when you are struggling and find something and you ask for help you realize that collaboration gets you in a long way." While in their perspectives, undergraduates viewed collaboration as way of making up for their weaknesses and building upon their strengths, graduate students in the current study appeared to consider collaboration as a means of building academic and social networks beyond coursework experiences. Charity cited,

I see collaborative learning as a way for me to work with others and establish network relationships. You learn personal issues about people. It is not all about the coursework but it is also about learning about the person you are working with.

Students' background and orientations. The findings, again, showed that students bring their own cultural background and orientations in prescribing their preference for collaborative learning experiences. For instance, Nash emphasized:

Some of the students just want to work individually and then collaborate in discussions. They don't want to do the work collaboratively. I think it is a perfect thing to have but I think with some students, they need their space. They just want to work in a little corner and come back and share with the class. They don't want to rely on other people to help them. It is a nice thing in general, but to some people, they just don't want it.

Graduate students in the current study appeared skeptical about not just the opportunity but whom they actually work with. Gifty indicated:

I like opportunities to collaborate outside in order to seek help in areas that I struggle. As an adult learner, I really love working with some people, not all of them but with people that I can work with . . .

Tasha, an instructor, disclosed:

 . . . with collaborative groupings, you go round and observe and you see students who never speak in class. They never raise their hand and say anything in a large group but will say something in a small group.

In sharing her experiences, Charity cited:

Some people don't want to take your ideas into consideration. They think what they wrote or what they brought up, that is it, that is what has to be taken into consideration and if you try to not criticize but critique it in a good way, they feel you are putting them down in some ways.

Conditions Necessary for Effective Collaborative Experiences in the College Classroom

The second part of the qualitative phase explored conditions necessary for creating effective collaborative learning experiences in a college classroom. Three themes emerged from the analysis: understanding collaboration process; monitoring, assessment, and evaluation system; and group composition.

Understanding collaboration process. The findings of the current study demonstrated the need for both instructors and students to understand what and how it means for students to collaborate. Nash explained:

I think first of all, you have to know what collaboration is. I think they just use the word referring to working with other people but they don't understand the intricacies of it and I still don't get it. It is not just splitting up some work for students to do, it is not just getting them in groups.

What it meant to collaborate among students was to, according to Joel, "have students give off their energies as they interact toward a common goal and try to help each other, instead of taking some parts moving away and coming together. They have to keep working together and keep interacting." Understanding the process of collaboration, according to participants, also meant encouraging students to use their strengths and help each other with their weaknesses. This included ensuring the "togetherness of students." In sharing her experiences, Dove indicated that their collaborative effort often paid off well because they were able to work together as a group.

Monitoring, assessment, and evaluation systems. One other key issue with collaboration in the college classroom the current study found was how to effectively monitor, assess, and evaluate individuals' level of engagement as well as group efforts. "I think one important issue is how to assess students as they work together. Some people have certain traits and some can also combine a set of skills and I may not have time to assess all that," Nash disclosed. Students as well as instructors appeared to hold different assumptions about how to monitor and reward individual and group efforts. In sharing his experiences, for instance, Nich said:

I had assignment recently for undergraduate science class where they did a research whether it is quantitative or qualitative, and they did it with their partners. But I felt some of them were just following their partners, they just tended in one report with both names. When they shared in class one of them did most of the talking, I could tell.

However, Dan, an undergraduate student, shared a contrasted view by stating;

I think it is difficult to assess or evaluate our efforts fairly because the fact that someone is not talking does not mean he or she did not do the work. Someone talking does not also mean he or she did most of the work. We might not know the story behind how the work unfolded and if students don't report other students, the instructor may think all worked well in the group.

Group composition. Both student and instructor participants perceived group composition as an important factor in implementing collaborative experiences in the college classroom. Gifty disclosed, "I always want to work with students but only with people that I think we can work together so that I can get my stuff done." The individual uniqueness in the group, the group dynamics, the strengths and weakness of students, and student choices were identified by both instructor

and student participants as key issues in terms of student groupings. For instance, Charity expressed, " . . . as a student, I still prefer the professor to form the groups because I think professors know who works well with whom."

Discussions and Implications

Most contemporary classroom pedagogical decisions across different levels and multiple disciplines are ascribed to the constructivist traditions. This relates to the conception that CLE drives students' knowledge construction through their active engagement in deep and meaningful learning experiences (Jonassen et al., 1999; Rikers, Gog, & Paas, 2008). The idea that higher education seeks to provide students with opportunities to experiment with new ideas, new relationships, and new roles (Gurin, Dey, Hurtado, & Gurin, 2002) makes constructivist frameworks particularly important in the college classroom. Because limited studies have examined the preferential patterns of college students in terms of their learning experiences, less is known about how they perceive their own roles in an environment that is supposed to empower them. The current study used an ESD to investigate college students' preferred learning experiences embedded in the CLE and whether students' experiences differed with their level of education (quantitative phase). On the factors that students' preferences differed, those differences were explored as reflected in instructors and students' perceptions and experiences.

College Students' Preferred Learning Experiences Embedded in a CLE

Although there is lack of consensus on the dimensional limits of CLE (Rikers et al., 2008), researchers have studied different dimensions that reflect diverse learning perspectives. The basic assumption of constructivism is that knowledge is actively constructed by learners. Researchers have used dimensions of arguments, discussions, debates, conceptual conflicts and dilemmas, sharing ideas with others, reflections, concept investigation, and real-life examples to assess the extent to which college students perceive their learning environment as constructivist oriented (Gijbels et al., 2006; Tenenbaum et al., 2001). In the current study, college students' preference for constructivist learning experiences were investigated using multidimensional scales of personal relevance, student autonomy, collaboration, and student negotiation. The evidence from the current study indicated that undergraduates were more likely than graduate students to prefer collaborative learning experiences and negotiation. In a previous study, Loyens et al. (2008) found no significant differences among first, second, and third year students' conceptions on cooperative learning. In the current study, collaboration scale assessed students' perceived preference for opportunities to work together with other students to accomplish shared learning goals (Johnson et al., 2000). Negotiation scale assessed the perception of students' preference for

opportunities to interact and negotiate meaning, thereby, building consensus by explaining and modifying their ideas in the contexts of other students' ideas (Taylor et al., 1993).

Conceptually, collaboration and negotiation share instructional commonalities in terms of purpose and the overall outcome but might have different structures and processes through which they are carried out. This was statistically supported with a significant inter-correlation coefficient between collaboration and negotiation. They both constitute different forms of student social learning. Thus, creating collaborative learning environment might increase the chances for students to negotiate ideas and deal with individuals' prejudices and misconceptions. The significance of this finding relates to students' decisions to seek opportunities to interact and construct new understanding with other students, either in small or large groups. With graduate education seeking to provide students with advanced knowledge and skills to develop innovative and critical thinking skills (Wendler et al., 2010), it was expected that graduate students would rather prefer more opportunities to explore the social milieu within the CLE. An exploration of participants' perspectives on collaboration within the qualitative phase found that these preferential differences reflected instructors and students' perceived opportunities for collaboration, benefits of collaboration, and students' background and orientations.

Both students and instructors in the current study considered collaboration as both social and intellectual space to modify understandings, encourage multiple and diverse perspectives, and build relationships. However, different range of opportunities seems to exist for both category of students, with undergraduates more likely to have adequate opportunities to engage in small-group activities. Also, students appeared to have different range of expectations, with graduate students preferring more varied approach to collaboration, while maintaining the core tenor of working together as a team. When students' expectations are aligned with the broad classroom goals, such expectations tend to govern their preferences and their approach to learning (Buckley, Novicevic, Halbesleben, & Harvey, 2004). Therefore, if graduate students observe repetitive patterns of less perceived usefulness of collaboration in terms of their own intellectual and social growth, they may prefer to rely on their individual acuteness. If higher education can foster students' skills to communicate, think and reason effectively, make judgments about the accuracy of large volumes of information, solve complex problems, and work collaboratively in diverse teams (Pellegrino, Chudowsky, & Glaser, 2001), expanding the space for intellectual and social synergy is critical.

Graduate students tend have broad learning needs that relate to building research efficacies, synthesizing complex ideas, and communicating ideas. Their ability to master these complex attitudes and skills is more likely to occur in a learning environment where enormous opportunities exist for students to work in groups and mutually seek meaning and understanding to complex problems (Smith & MacGregor,

1999). Varying collaborative experiences can also appeal to the multiple and diverse learning needs of students. These can be done through different group activity models such as writing fellows, cooperative learning, peer teaching, simulations, writing groups, and supplemental designs (Smith & MacGregor, 1999). In each case, instructors can provide structures to guide students' interactions and allow adequate feedbacks from students to inform the process.

Essential Conditions for Creating Effective Collaboration in the College Classroom

Expanding on the quantitative results, the researcher explored conditions that might be essential in designing effective collaborative activities in the college classroom. The findings showed three main conditions: understanding collaboration process; monitoring, assessment, and evaluation systems; and group composition. Previous studies have discussed understanding (McDuff, 2012; Osterholt & Barratt, 2010; Smith & MacGregor, 1999) assessment (Pombo, Loureiro, & Moreira, 2010) and groupings (Oakley, Brent, Felder, & Elhajj, 2004; Osterholt & Barratt, 2010) aspects of collaboration.

Understanding collaboration process. Students' preference to negotiate with other students to modify their ideas closely related to students' preference for collaboration experiences. The findings were consistent with the observation that as students become more and more confident in their paired activities, they transition into larger group sizes to learn the importance of negotiating more than one perspective (Osterholt & Barratt, 2010). Students may negotiate many perspectives to reach a mutual consensus to produce a collaborative outcome (Osterholt & Barratt, 2010). Collaboration and negotiation, as conceptually related, help advance the value for multiple perspectives in knowledge construction. Both students' and instructors' level of understanding of the process of collaboration was found to be critical if collaboration in the college classroom can be effective. The term *collaboration* has often and loosely been used to mean any form of group (small or large) activities. With this basic understanding, attention is drawn to the final product more than the processes that students have go through as they try to work toward achieving their mutual goals. Smith and MacGregor (1999) had defined collaborative learning as an umbrella term encapsulating variety of educational approaches involving joint intellectual effort by students who work in groups and mutually search for understanding and meaning of an assigned task.

Students in the current study held different expectations as they collaborate with other students. Some instructor and student participants perceived that some students take collaborative activities as avenues to relieve themselves of coursework pressure, thereby adopting relatively passive roles. However, others use it to advance their understanding and deal with their misconceptions. These contrasted expectations held

by students undermine the essence of working together as a group. Students tend to complete different parts of the assignment individually and arrange for the final product (Pombo et al., 2010). As argued, it is important for students to begin to understand the limitations of "singular, personal experiences" that can lead to "ego-centric" thinking (Paul & Elder, 2010). The framework of collaboration should be constructed on a deep understanding informed by a set of guiding principles (McDuff, 2012). In implication, the structure and interactive process of collaboration should be constructed on shared and agreeable rules, norms, ethics, and principles.

Effective monitoring, assessment, and evaluative framework. The findings of the current study indicated that effective monitoring, assessment, and evaluative criteria to determine both group and individual efforts are essential features of effective collaboration. The findings were consistent with previous studies (Pombo et al., 2010). Drawing out clear criteria for determining and rewarding both individual and group efforts should be central in maintaining fairness, orderliness, and the sense of responsibility among team members. During small-group activities, some students have the tendency to go off track which can divert attention and efforts. Therefore, monitoring systems should determine a broad collective and individual collaborative competencies and traits found within and between groups. In addition, providing structure that specifies roles, sets timelines, and determines feedback criteria might help to reduce group infractions and disagreements that have the potential to undermine individual efforts. Fostering peer feedback, either individually based or group-based, can be useful in informing the systemic structure of the collaboration process.

Effective group composition. Effective grouping in collaboration learning experiences, from participants' perspectives, is one of the key factors that mediate collaboration. The finding was consistent with previous research (Oakley et al., 2004). Ongoing discussions suggest contrasted positions on student-formed groups and instructor-formed groups. However, current research evidence supports instructor-formed groups (Oakley et al., 2004; Obaya, 1999). Consistent with the current study, student participants were more likely to prefer instructor-formed groups than those constituted by students' themselves. Collaboration experiences are used, among other things, to model to students the realities of the social complexities that await them in their prospective careers. Metaphorically, as workers, they would not get to choose their managers, supervisors, and even their coworkers. Collaborative activities are, therefore, expected to mirror the complex experiences in the larger society. Also, the dynamics of the classroom population in terms of students' cultural backgrounds, ethnicity, sex, learning styles, strengths, and weakness need to be considered in forming groups. Homogeneous groups where "strong students" group themselves, and "weak students" in another group or minority and majority in

distinct groups undermine the unique strength of social construction of knowledge. The advantage of instructor-formed groups over student-formed groups is that instructors are able to form groups whose members are diverse academically, culturally, and socially. Groups of such nature might help to curtail possible isolations. In all these, the instructor might need to have a considerable depth of understanding about the contextual relevance of the entire process of collaboration.

Limitations and Direction for Future Research

The strength of the current study lied in its ability, using a single study, to address multidimensional questions related to CLE. The results of the current study indicate that collaboration as a central tenet of constructivism is an essential learning experience that fosters student classroom engagement. It provides contexts for integrating, testing, and evaluating student diverse sociocultural beliefs and perspectives into the framework of knowledge construction (Jonassen et al., 1995). However, the generalizability of the results should be done with context, given that the data were drawn from a cross section of a study population from a single institution which was predominantly White Caucasians and also the majority of participants being education majors. Again, while the study illuminates important issues about CLE, the dimensions captured (collaboration, autonomy, negotiation, personal relevance) were not broad enough to provide a comprehensive understanding of CLE. Therefore, the conclusions of the current study need to be examined in light of further studies informed by a range of learning experiences embodied in constructivism. Also, as the instrument used to measure college students' preferred learning experiences in a CLE was a new instrument, future studies can increase the range of the individual items to improve the variability within each factor.

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