

# ***ENHANCING STUDENTS' SELF-EFFICACY, ELABORATION, AND CRITICAL THINKING SKILLS IN A COLLABORATIVE EDUCATOR PREPARATION PROGRAM***

**Hungwei Tseng and Teresa Gardner**

*Jacksonville State University*

**Hsin-Te Yeh**

*Metropolitan State University of Denver*

In the learner-centered learning environment, students can connect and engage with their peers and with the real world easily. The purpose of this study was to examine the relationships of online students' perceptions of learner-centered approach, motivated strategies for learning, and critical thinking skills. Participants were 15 graduate students enrolled in 2 online courses. The students reported the online courses they were taking utilized learner-centered instructions. Moreover, the results revealed that students reported increased mean scores on learner-centered approach ( $M = 3.89$ ,  $SD = .44$ ) and on all three motivated strategies for learning (self-efficacy, elaboration, and critical thinking) after completing all course activities. On average, students scored 24.84 out of 28 possible points on their critical thinking skills from the assessment of the assigned project. In addition, the results also revealed that learner-centered approach was positively correlated with all three motivated strategies for learning and was significantly correlated with elaboration learning strategy ( $r = .55$ ). The highest correlation was found between elaboration and critical thinking learning strategies ( $r = .69$ ). The results of this study also indicated that online students who have higher perceptions of learner-centered approach are more likely to have higher motivated strategies for learning, especially critical thinking skills.

## ***INTRODUCTION***

Traditionally, learning took place when instructors and students were in the classroom at the same time. The learning content was unique and was usually presented through paper-based materials. In addition, "students

passively receive information, emphasis is on acquisition of knowledge" (Huba & Freed, 2000, p. 5). Learning was one way and one dimension. In the 21st century, the new and emerging electronic learning technologies (e-learning) have changed learning from restrictive to flexible, accessible, and innovative

---

• **Hungwei Tseng**, Instructional Designer, Online@JSU, and Assistant Professor, Department of Educational Resources, Jacksonville State University, 700 Pelham Rd. N, 212A Self Hall, Jacksonville, AL 36256. Telephone: (256) 782-8529; E-mail: htseng@jsu.edu

---

The Quarterly Review of Distance Education, Volume 17(2), 2016, pp. 15–28  
Copyright © 2016 Information Age Publishing, Inc.

ISSN 1528-3518  
All rights of reproduction in any form reserved.

approaches. Learners can no longer rely only on lectures to tell them what and when to learn. They are expected to “assume a high level of responsibility in the learning situation and be actively choosing their goals and managing their learning” (Sparrow, Sparrow, & Swan, 2000, p. 2). In the learner-centered learning environment, students can connect and communicate with their peers and with the real world easily and they can access the information anywhere anytime. Weimer (2002) indicated five key changes in a learner-centered classroom: the balance of power, the function of content, the role of the teacher, the responsibility for learning, and the purpose and processes of assessment. McCombs and Whisler (1997) defined “learner-centered” as the following:

“Learner centered” is the perspective that couples a focus in individual learners—their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs—with a focus on learning—the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners. (p. 9)

Learner-centered principles and their practices form a universal, systemic framework for accomplishing high-quality instruction in any context (McCombs, 2015). In an online context, this involves cognitive and metacognitive as well as motivational, social, and other individual difference factors to motivate and optimize students learning. Palloff and Pratt (2013) stated that an effective online instructor is someone “who is open to giving up control of the learning process” (p. 24) by making students participate in their learning process actively. Instructor’s role is to foster student participation and engagement through well-thought and well-designed authentic activities. A recent review of literature indicated that learner-centered learning environment is offered as a norm in online learning while approaches of constructivism epistemology

and situated cognition are implemented in course designs (Ke, 2010). Ke and Kwak’s (2013) study found that five key constructs of student-centered learning in online courses (learner relevance, active learning, authentic learning, learner autonomy, and computer technology competence) predicted students’ perceived satisfaction with online courses and web-based distance education at a statistically significant level. In addition, education systems must engage in a paradigm shift focused on learner-centered pedagogy because of the increased diverse learners in the online learning environment. Learners should benefit from the diverse expertise, experiences, and skills in the learning communities. The instructional structures should also allow means for learners to build relationships, implement strategies that engage learners with different backgrounds, learning styles, and provide learning ownership and control to learners (McCombs & Vakili, 2005). Gardner (2012) also clearly stated that learner-centered learning needs to provide “high-quality, engaging learning opportunities that meet the diverse needs of all learners, have flexible timing and pacing, and include a range of learning environments, supports and services tailored to meet learner needs” (p. 231).

As stated earlier, learner-centered learning is a personal interpretation of the world in that learner’s beliefs and is an active and collaborative process of making meaning from prior experience (Semple, 2000). Based on these principles, it is important to integrate collaborative learning and problem-based learning strategies when designing and implementing learner-centered learning. Collaborative learning is an instructional strategy that involves groups of learners working together to solve a problem, complete a project, or create a product. The purposes of collaborative learning settings are to engage learners’ critical thinking and problem solving skills in the social interactive environment. Jonassen, Davidson, Collins, Campbell, and Haag (1995) noted that collaboration in a constructivist classroom resulted not only in personal meaning making

on the part of the individual student but also in the social construction of knowledge and meaning. Studies discovered that collaborative learning, through the active social interactions, could improve learning efficacy and facilitate critical thinking skills (Johnson, Archibald, & Tenenbaum, 2010; Ku, Tseng, & Akarasriworn, 2013; Omar, 2015).

Problem-based learning (PBL) is a learner-centered, contextualized approach to schooling. The goals of PBL include: (1) developing scientific understanding through real-world cases, (2) developing reasoning strategies, and (3) developing self-directed learning strategies. In this approach, learning begins with a problem to be solved rather than content to be mastered. Learners actually work on problems in ways that require them to develop expert knowledge, problem-solving proficiency, lifelong learning skills, and team participation skills. Hence, they can apply these skills and knowledge to new real-world situations. According to Dunlap (2005), the problems that learners work on reflect the real world situations and are complex and ill-structured. Learners are actively involved in the learning process from problem introduction to solution implementation and process reflection without formulaic solution. Thomas (1997) stated that the basic principle of PBL is learning in a small group that is initiated through authentic and mostly ill-structured problems. "Students discuss these problems in order to identify their state of knowledge and what they need to know. This leads them to the definition of learning objectives and the organization of each individual's tasks and learning steps" (Zumbach, Hillers, & Reimann, 2004, p. 88). PBL as an instructional strategy to improve critical thinking has been studied extensively in the field (Tiwari, Lai, So, & Yuen, 2006; Yuan, Williams, & Fan, 2008). In addition, Kek and Huijser (2011) stated that PBL has the potential to develop critical thinking skills. The American Philosophical Association (1990) has defined critical thinking as "the process of purposeful, self-regulatory judgment. The process gives reasoned consider-

ation to evidence, contexts, conceptualizations, methods, and criteria" (p. 3). Students no longer receive information from instructors passively with no control as to what and how they will learn. Instead, students become actively involved in the learning process. They can make decisions themselves on searching the resources or information and then transform the information to make it more meaningful to them. Sulaiman (2011) studied 102 students from the School of Science and Technology and the School of Education and Social Development in Malaysia to investigate whether student performance in creative thinking could be enhanced through problem-based learning and critical thinking. The findings suggested that students have the opportunity to practice critical thinking during PBL and PBL is capable of having a positive impact on students' critical thinking.

Learning through a learner-centered approach, students have taken more responsibilities for their learning and have developed skills in social engagement (Giddens, Hrabe, Carlson-Sabelli, Fogg, & North, 2012; Kramer et al., 2007). Thus, motivation is an important factor in learning despite the developing of innovative ways to deliver instruction (Clayton, Blumberg, & Auld, 2010) and self-regulated learning has emerged as an effective motivational strategy for online students to be successful in online courses (Carson, 2011; Cho & Shen, 2013; Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011). Students with a motivational orientation involving beliefs that the task is interesting and important will engage in more metacognitive activity and more effective effort management. Moreover, Duncan and McKeachie (2005) argued that "motivation is dynamic and contextually bound and that learning strategies can be learned and brought under the control of the student" (p. 117) rather than static traits of the student. Credé and Phillips (2011) further explained this concept and noted that students' motivation and learning behavior for academic tasks may change from course to course (e.g., advanced seminar in chosen major versus a

required general education course), and even across different tasks within the same course (e.g., study for a multiple choice exam versus writing a term paper).

Hannum, Irvin, Lei, and Farmer (2008) studied the effectiveness of training facilitators to follow American Philosophical Association learner-centered principles on student retention. The results indicated that students completed the semester at a statistically higher rate where their facilitators were trained to follow a more learner-centered approach. Cheang (2009) evaluated the effects of the learner-centered approach on changes in pharmacotherapy students' motivation and learning strategies. Cheang found that students responded with a positive attitude to the learner-centered approach and students had improvement on intrinsic goal orientation control of learning beliefs, self-efficacy, critical thinking, and metacognitive self-regulation. In this study, self-efficacy is defined as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Bandura noted that people with high efficacy are more focused on task requirements and less distracted by off-task cognition. In an online learning environment, students' perceived self-efficacy for the course content was positively related to their academic performance (Zhu, Chen, Chen, & Chern, 2011). Wohlfarth et al. (2008) studied student perceptions of learner-centered teaching. The results indicated that all students had positive responses on learner-centered paradigm and students confirmed that it could help them develop their critical thinking skills and encourage their self-directedness. The participants in Abel and Campbell's study (2009) preferred to learn in a learner-centered approach. The results revealed that the students' development of advanced practice skills was enhanced in the learner-centered class. In regard to the effect of a learner-centered approach on students' academic achievement, Rapoo (2000) conducted a study that examined the relationships of high-school students' perceptions of a learner-cen-

tered approach, self-efficacy, and academic achievement in South Africa. The results revealed a positive, significant relationship between students' self-efficacy and perceptions of the learner-centered approach. However, no significant relationship was found between students' self-efficacy and academic achievement.

Education is not only transferring knowledge to students but also serving as the principal means of preparing students to be problem solvers and decision makers in this competitive global world. Therefore, it is crucial to prepare students to become critical thinkers (Schafersman, 1991). People thinking critically consistently attempt to live rationally, reasonably, and empathically. Moreover, they stated that "a well cultivated critical thinker" should have the following characteristics: (a) raises vital questions and problems, formulating them clearly and precisely, (b) gathers and assesses relevant information, using abstract ideas to interpret it effectively comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards, (c) thinks open-mindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences, and (d) communicates effectively with others in figuring out solutions to complex problems.

There is a gap in the literature examining the relationships between learner-centered approaches and online learning (Ware, 2006). The impact of learner-centered approaches on online students' motivated strategies for learning (e.g., self-efficacy, elaboration, and critical thinking) has not been studied extensively. Moreover, there are a few exemplary studies that specifically examined the impact of learner-centered approaches on distance students' critical thinking skills. Instead of just focusing on the traditional assessment method (e.g., objective exam scores) to assess students' achievement in learner-centered learning environment, researchers should also measure students' critical thinking skills to determine students' academic success.

The purpose of this study was to examine the relationships of online students' perceptions of a learner-centered approach, motivated strategies for learning, and critical thinking skills. In addition, the present study sought to understand students' perspectives in critical thinking and what critical thinking skills they had developed through the learning process. The following research questions were addressed:

1. What were online students' perceptions of a learner-centered approach and motivated strategies for learning?
2. What was the relationship of online students' perceptions of a learner-centered approach and motivated strategies for learning?
3. What was the relationship of online students' perceptions of a learner-centered approach and students' critical thinking skills?

### **Definitions of Studied Variables**

*Learner centered* "is the perspective that couples a focus in individual learners—their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs—with a focus on learning—the best available knowledge about learning and how it occurs and about teaching practices that are most effective in promoting the highest levels of motivation, learning, and achievement for all learners" (McCombs & Whisler, 1997, p. 9).

*Critical thinking* is "the process of purposeful, self-regulatory judgment. The process gives reasoned consideration to evidence, contexts, conceptualizations, methods, and criteria" (American Philosophical Association, 1990, p. 3).

*Self-efficacy* refers to "a self-appraisal of one's ability to master a task. Self-efficacy includes judgments about one's ability to accomplish a task as well as one's confidence in one's skills to perform that task" (Pintrich, Smith, Garcia, & McKeachie, 1991, p. 13).

*Elaboration strategies* "help students store information into long-term memory by building internal connections between items to be learned" (Pintrich et al., 1991, p. 13).

*Critical thinking strategies* "refers to the degree to which students report applying previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations with respect to standards of excellence" (Pintrich et al., 1991, p. 22).

## **METHODOLOGY**

### **Participants**

Participants in this study were graduate students enrolled in two online courses—"Characteristics of Students With Mild to Moderate Disabilities" and "Assessment of Special Populations" offered by the Collaborative Teacher Educator Preparation Program at a university in the southern United States. At the midterm, 15 students (10 female and 5 male) completed both *Learner-Centered Approach Survey* and *Motivated Strategies for Learning Questionnaire (MSLQ)*. The majority of respondents were 18–29 years old (62.5%). Among the students, nine (60%) had less than 5 years, 4 (26.6%) had 5–10 years, and two (13.3%) had 10–15 years of teaching experiences. During the finals week, the students were asked to take both surveys again and 13 students (8 female and 5 male) responded.

### **Collaborative Teacher Education Program**

The Department of Curriculum and Instruction at this university offers the Collaborative K–6 and 6–12 Alternative A program that is designed for students who want to teach in a special education collaborative setting K–12 and who have a previous degree in an academic discipline other than education. The essential focus of this program is to offer high quality (a) online graduate level courses in collaborative methods, assessment, assistive tech-

nology, and diversity, (b) clinical experiences in a variety of special education settings, and (c) specialty courses including advanced assessment, assistive technology, and applied behavior analysis. Student can complete the Collaborative K–6 and 6–12 Alternative A program and be eligible for an Alabama Teacher Class A Certification in K–6 and 6–12 Collaborative Education.

### ***Courses and Learner-Centered Assessments Design***

The two fully online courses in the present study were designed and taught by applying constructivist theory that through the process of collaborative tasks and interaction between students so the learning is constructed and managed by the students themselves. The role of the instructor in constructivist theory is to “understand how students interpret knowledge and to guide them to refine their understanding and interpretations to correct any misconception arises between students at an early stage” (Schreurs & Al-Huneidi, 2011, p. 3). The learning management system, Blackboard, was utilized to manage user learning interventions and assist in the planning, distribution and evaluation of a specific learning process. LiveText online assessment system was also used to document students’ learning outcomes. Since those two courses were fully online context, the course materials, assignments, and assessments were designed to guide students to become self-regulating learners and encourage them to be responsible for their own learning. When courses began, the instructor posted welcome message to students and also clearly declared that participations of all course activities would be assessed thoroughly. Students were encouraged to use discussion board, wiki, Blackboard Collaborate, and other tools to communicate and interact with the instructor and peers. Moreover, course contents were organized as modules with small chunks of information that helped students to construct evolved knowledge. A graded discussion

forum was required in each module, providing them with opportunity to interact.

Additionally, the online courses were designed to build an integrative and authentic learning environment and to use problem-based learning strategies to foster students’ abilities on solving ill-defined problems. Students were the center and decision maker of their own learning and they are challenged to gather relevant information to find a better answer.

Two projects were designed by the instructor to assess online students’ critical thinking skills: Mock Individualized Education (IEP) Program Meeting assignment for the course of “Characteristics of Students With Mild to Moderate Disabilities” and the Student Assessments/Case Studies/Video assignment for the course of “Assessment of Special Populations.”

For the Mock IEP Meeting assignment, the participants worked with assigned group members to act out the part of general education teacher, special education teacher, or parent. The group recorded a mock IEP meeting using the Individualized Education Plan/Behavior Support Plan (IEP/BSP) created by the group. The objective of this assignment was for participants to demonstrate the ability to manage student behavior through demonstration of management techniques. For the Student Assessments/Case Studies/Video assignment, the participants were asked to use informal and formal assessments discussed in class and approved by the instructor. They determined an appropriate grade level assessment to assess one student with disabilities and videotaped themselves administering mathematics and reading assessments.

### ***Instrumentation***

*Learner-Centered Approach Survey.* In this study, online students’ perceptions of learner-centered approach were measured using a 13-item survey developed by Harpe and Phipps (2008). The survey was designed based on Weimer’s (2002) description of the five princi-

ples of learner-centered teaching. All items were measured on a 5-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The questions in the survey included, for example, "I was provided with increased opportunities to demonstrate that I had learned the material," "I was able to focus on learning rather than just getting a good grade on an exam or assignment," and "I found that completing the assignments helped reinforce the material presented in class more than studying alone." In this study, Chronbach's  $\alpha$  coefficient was .85.

*Motivated Strategies for Learning Questionnaire (MSLQ).* To assess students' motivated strategies for learning, the Motivated Strategies for Learning Questionnaire (Pintrich et al., 1991) was utilized. The MSLQ includes 81 questions and consists of six motivational subscales and nine learning strategies subscales. In this study, the researchers focused on only one motivational subscale (self-efficacy for learning and performance—7 items) and two learning strategies subscales (elaboration—5 items; critical thinking—5 items). According to Pintrich et al. (1991), self-efficacy is a "self-appraisal of one's ability to master a task. Self-efficacy includes judgments about one's ability to accomplish a task as well as one's confidence in one's skills to perform that task" (p. 13). The questions included, for example, "I believe I will receive an excellent grade in this class" and "I'm confident I can learn the basic concepts taught in this course."

Elaboration strategies help students "store information into long-term memory by building internal connections between items to be learned. Elaboration strategies include paraphrasing, summarizing, creating analogies, and generative note-taking. These help the learner integrate and connect new information with prior knowledge" (Pintrich et al., 1991, p. 13). The questions included, for example, "I try to relate ideas in this subject to those in other courses whenever possible" and "When reading for this class, I try to relate the material to what I already know."

Critical thinking strategies refer to "the degree to which students report applying previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations with respect to standards of excellence" (Pintrich et al., 1991, p. 22). The questions included, for example, "I often find myself questioning things I hear or read in this course to decide if I find them convincing" and "Whenever I read an assertion or conclusion in this class, I think about possible alternatives."

In this study, Chronbach's alpha coefficients for self-efficacy, elaboration, and critical thinking were, .85, .87, and .89, respectively. In addition, students were also asked to answer two open-ended questions regarding their perspectives in critical thinking skill. These questions were (1) How do you define critical thinking? and (2) In this course, what critical thinking skills do you develop?

*Critical Thinking Skills Rubric.* In order to assess students' critical thinking skills, the critical thinking skills rubric developed by Blue, Taylor, and Yarrison-Rice (2006) was used. The rubric described seven primary traits and four levels of performance for each of these traits ranging from 1 (*scant*), 2 (*minimally developed*), 3 (*moderately developed*), to 4 (*substantially developed*). Maximum possible score of this critical thinking skills rubric was 28. According to Blue et al., the seven primary traits identified for assessment were:

1. identifies and summarizes the problem/question at issue;
2. identifies and presents the student's own perspective and position as it is important to the analysis of the issue;
3. identifies and considers other salient perspectives and positions that are important to the analysis of the issue;
4. identifies and assesses the key assumptions;
5. identifies and assesses the quality of the supporting data/evidence and provides additional data/evidence related to the issue;

6. identifies and considers the influence of context on the issue; and
7. identifies and assesses conclusions, implications, and consequences

### **Data Collection and Data Analysis Procedures**

This study was approved by the Institutional Review Board, and all students received an e-mail notice from the researcher with the consent form describing the purpose of the study, researcher's contact information, and time (15 to 20 minutes) to fill out the questionnaire. Later, students received an e-mail invitation asking them to complete the *Learner-Centered Approach Survey* and *Motivated Strategies for Learning Questionnaire (MSLQ)* a week after midterm and during the finals week. During the finals week, students submitted their final projects to the instructor. The projects were graded based on the criteria in the critical thinking rubric by the researchers.

Descriptive statistics were calculated for the Learner-Centered Approach Survey and the Motivated Strategies for Learning Questionnaire. The multivariate correlational analysis was conducted to exam the relationships of online students' perceptions of learner-centered approach, motivated strategies for learning, and student' critical thinking skills.

### **RESULTS**

Research question one was formulated to examine online students' perceptions of learner-centered approach and motivated strategies for learning. The mean scores and standard deviations of 13 *Learner-Centered Approach Survey* items collected at the end of the courses were tabulated and ranked as shown in Table 1. The overall mean score across the 13-item survey was 3.89, indicating positive agreement on their experiences of learner-centered learning.

The three highest-rated statements in the survey were "I was provided adequate feedback to guide my learning throughout the course" ( $M = 4.31$ ,  $SD = .75$ , Strongly Agree & Agree—84.6%), "I found that completing the assignments helped reinforce the material presented in class more than studying alone" ( $M = 4.31$ ,  $SD = .63$ , Strongly Agree & Agree—92.3%), and "I felt I was able to learn the material and obtain the grade I desired" ( $M = 4.23$ ,  $SD = .73$ , Strongly Agree & Agree—84.6%). On the other hand, the three lowest-rated statements were "I felt less pressure to perform well on every exam or assignment" ( $M = 2.92$ ,  $SD = 1.12$ , Strongly Agree & Agree—38.5%), "I felt I was in a less stressful learning environment" ( $M = 3.54$ ,  $SD = .97$ , Strongly Agree & Agree—53.8%), and "I studied differently for exams" ( $M = 3.54$ ,  $SD = .97$ , Strongly Agree & Agree—53.8%).

Participants were asked to complete both *Learner-Centered Approach Survey* and the *Motivated Strategies for Learning Questionnaire (MSLQ)* at the midterm and at the end of the course. Table 2 showed the results of the descriptive analysis. Students responded positively to the learner-centered approach ( $M = 3.78$ ,  $SD = .42$ ) and high mean scores on the self-efficacy ( $M = 4.02$ ,  $SD = .45$ ), elaboration ( $M = 4.31$ ,  $SD = .47$ ), and critical thinking ( $M = 3.87$ ,  $SD = .32$ ) at the midterm. The results also revealed that students reported increased mean scores on learner-centered approach ( $M = 3.89$ ,  $SD = .44$ ) and on all three motivated strategies for learning after completing all course activities. Student's critical thinking skills were assessed by the researchers using the critical thinking rubric. On average, students scored 24.84 out of 28 possible points on their critical thinking skills from the assessment of the assigned project.

Research question two examined the relationship of students' perceptions of learner-centered approach and motivated strategies for learning. The results revealed that (see Table 3) learner-centered approach was positively correlated with all three motivation/learning strategies and was significantly correlated with

TABLE 1  
Learner-Centered Approach Survey

| <i>Survey Items</i>                                                                                                | <i>Mean (SD)</i> | <i>Rank</i> | <i>Strongly Agree &amp; Agree</i> |
|--------------------------------------------------------------------------------------------------------------------|------------------|-------------|-----------------------------------|
| I was provided adequate feedback to guide my learning throughout the course.                                       | 4.31 (.75)       | 1           | 84.6%                             |
| I found that completing the assignments helped reinforce the material presented in class more than studying alone. | 4.31 (.63)       | 1           | 92.3%                             |
| I felt I was able to learn the material <i>and</i> obtain the grade I desired.                                     | 4.23 (.73)       | 3           | 84.6%                             |
| My ability to learn the material presented was enhanced.                                                           | 4.15 (.90)       | 4           | 84.6%                             |
| I was provided with increased opportunities to demonstrate mastery of course material.                             | 4.15 (.38)       | 4           | 100%                              |
| I was provided with increased opportunities to demonstrate that I had learned the material.                        | 4.08 (.64)       | 6           | 84.6%                             |
| I was able to focus on learning rather than just getting a good grade in the course.                               | 3.92 (.64)       | 7           | 76.9%                             |
| I felt I had more control in determining my overall course grade.                                                  | 3.85 (.69)       | 8           | 69.2%                             |
| I was able to focus on learning rather than just getting a good grade on an exam or assignment.                    | 3.85 (.69)       | 8           | 69.2%                             |
| I prepared differently for class.                                                                                  | 3.69 (.95)       | 10          | 53.8%                             |
| I studied differently for exams.                                                                                   | 3.54 (.97)       | 11          | 53.8%                             |
| I felt I was in a less stressful learning environment.                                                             | 3.54 (.97)       | 11          | 53.8%                             |
| I felt less pressure to perform well on every exam or assignment.                                                  | 2.92 (1.12)      | 13          | 38.5%                             |
| Overall                                                                                                            | 3.89 (.44)       |             |                                   |

Note: Responses ranged from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*).

TABLE 2  
Mean and Standard Deviation of Learner-Centered Approach,  
Motivated Strategies for Learning, and Critical Thinking Skills

| <i>Variables</i>                          | <i>Pre<br/>(N = 15)</i> |           | <i>Post<br/>(N = 13)</i> |           |
|-------------------------------------------|-------------------------|-----------|--------------------------|-----------|
|                                           | <i>Mean</i>             | <i>SD</i> | <i>Mean</i>              | <i>SD</i> |
| Learner-centered approach                 | 3.78                    | .42       | 3.89                     | .44       |
| Strategies for learning—self-efficacy     | 4.02                    | .45       | 4.22                     | .39       |
| Strategies for learning—Elaboration       | 4.31                    | .47       | 4.34                     | .45       |
| Strategies for learning—critical thinking | 3.87                    | .32       | 3.97                     | .52       |
| Critical thinking skills                  | —                       | —         | 24.84                    | .93       |

Note: Learner-centered approach and motivated strategies for learning were measured on a 5-point Likert-type scale. Maximum possible score of critical thinking skills was 28.

elaboration learning strategy ( $r = .55$ ). Moreover, the highest correlation was found between elaboration and critical thinking

learning strategies ( $r = .69$ ). In terms of the relationship between students' perceptions of learner-centered approach and critical thinking

TABLE 3  
Intercorrelations of the Learner-Centered Approach,  
Motivated Strategies for Learning, and Critical Thinking Skills

| <i>Variables</i>             | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
|------------------------------|----------|----------|----------|----------|----------|
| 1. Learner-centered approach | —        | .18      | .55*     | .51      | .59*     |
| 2. Self-efficacy             |          | —        | .61*     | .38      | .17      |
| 3. Elaboration               |          |          | —        | .69**    | .12      |
| 4. Critical thinking         |          |          |          | —        | .36      |
| 5. Critical thinking skills  |          |          |          |          | —        |

\* $p < .05$ . \*\* $p < .01$ .

skills (research question three), Table 3 illustrated that there was positive and significant correlation ( $r = .59$ ) between these two variables.

## DISCUSSION

The primary purpose of this study was to examine the relationship between online students' perceptions of learner-centered approach, motivated strategies for learning, and critical thinking skills. The participants reported that the online courses they were taking in the Collaborative Teacher Education Program met most of the learner-centered approach principles. Most students felt strongly that they were provided with increased opportunities to demonstrate mastery of course material (100%) and with adequate feedback to guide their learning (84.6%), and assignment completion helped reinforce the material presented in class more than studying alone (92.3%). Moreover, by returning the responsibility and power for learning to the students (learner-centered approach), they gained more confidence of navigating through and interacting with learning materials and tasks. They felt more self-directed and more control over their learning. In contrast, when teachers control the process through and by which they learn, "students' motivation, confidence, and enthusiasm for learning are all adversely affected" (Weimer, 2002, p. 23). The results also revealed that students' percep-

tions of learner-centered approach, learning strategies (elaboration and critical thinking), and motivation (self-efficacy) increased slightly between the midterm and the end of the online courses. McCombs (2000) argued that "learner-centered is the perspective that couples a focus on individual learners (their heredity, experiences, perspectives, backgrounds, talents, interests, capacities, and needs) with a focus on learning" (p. 4). If instructors provide authentic and active learning activities that are meaningful and are related to their real-life experiences, students will understand their learning strengths and weaknesses and feel motivated in their learning process. The results of the study echoed with the prior studies regarding learner-centered approach and motivated strategies for learning.

For research question two, the findings accorded with Rapoo's (2000) and Cheang's (2009) studies that there are positive relationships between students' perceptions of learner-centered approach and self-efficacy. The findings showed that learner-centered instructions, which return the responsibility for learning to students, will give students more control and freedom on their learning. Thus, students are more willing to adopt effective learning strategies which will foster their abilities on constructing their own knowledge and help them interpret learning materials and tasks into more meaningful knowledge. In addition, the emphasis of learner-centered paradigm is on

“using and communicating knowledge effectively to address enduring and emerging issues and problems in real-life contexts” (Huba & Freed, 2000, p. 5). Instructors in the learner-centered environment facilitate learning by helping students formulate meaningful questions and devise strategies to answer those questions (Massouleh & Jooneghani, 2012). Thus, students are actively involved in gathering and synthesizing information and then integrate it with the skills of critical thinking and problem solving to the knowledge construction in this process of learning.

In term of the relationship between students' perceptions of learner-centered approach and critical thinking skills (research question three), the findings in this study are aligned with Sulaiman's (2011) conclusion that PBL (one of the learner-centered strategies) is capable of having a positive impact on students' critical thinking skills. In addition, the results in Martyn, Terwijn, Kek, and Huijser's (2014) study revealed that aspects of the PBL approach to teaching influenced the approaches to learning that students adopt and their critical thinking skills readiness. According to the online students participating in this study, learning in the learner-centered environment did have a positive impact on increasing their critical thinking skills. This again suggests that providing a learners-centered online learning environment has its value in promoting critical thinking skills.

## CONCLUSIONS AND FUTURE RESEARCH

The use of a learner-centered instructional approach can bridge the gap through the self-regulated and collaborative learning process. Students are more motivated and responsible for learning and more active in a teamwork manner than a teacher-centered paradigm (Karimi, Elbarbry, & Fortner, 2011) in online learning environment. In addition, the learner-centered paradigm has been hypothesized to promote students to self-directed and in-depth

learners (Paulson, 1999) and can improve students' motivation on learning, as well as critical thinking strategy (Cheang, 2009) in online learning environment. The findings of this study were consonant with the findings of previous studies. The results of this study do also suggest important implications for the nurturing of motivated learning strategies and critical thinking skills in the 21st century globalized online learning environment. Without doubt, learners in this new era should have capabilities to make clear decisions and handle future challenges more skillfully.

Future research should include larger and more representative samples, investigate to what extent learner-centered approach promotes learners' engagement in the learning process, and how students' critical thinking skills are improving over time in the online learning environment. Other factors from the motivated strategies for learning could be taken into consideration in similar studies. Furthermore, Yuksel and Alci (2012) concluded that a student's disposition to think critically is a necessary precondition for critical thinking, and it affects critical thinking capacity. Facione (1990) also stressed that the critical thinking dispositions are the “consistent internal motivation to engage problems and make decisions by using critical thinking” (p. 5). A future research should also focus on the impacts of critical thinking dispositions on students' decision making skills and academic performances.

## REFERENCES

- Abel, E. M., & Campbell, M. (2009). Student-centered learning in an advanced social work practice course: Outcomes of a mixed methods investigation. *Social Work Education*, 28(1), 3–17. doi:10.1080/02615470701844423
- American Philosophical Association. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction, recommendations prepared for the committee on pre-college philosophy*. ERIC No. ED 315 423.

- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York, NY: W.H. Freeman.
- Blue, J., Taylor, B., & Yarrison-Rice, J. (2006). *Full-cycle assessment of critical thinking in a general education seminar*. Presented at the Undergraduate Assessment Symposium, Cary, NC.
- Carson, A. D. (2011). Predicting student success from the LASSI for learning online (LLO). *Journal of Educational Computing Research*, 45(4), 399–414.
- Cheang, K. I. (2009). Effects of learner-centered teaching on motivation and learning strategies in a third-year pharmacotherapy course. *American Journal of Pharmaceutical Education*, 73(3), Article 42.
- Cho, M. H., & Shen, D. (2013). Self-regulation in online learning. *Distance Education*, 34(3), 290–301. doi:10.1080/01587919.2013.835770
- Clayton, K., Blumberg, F., & Auld, D. P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *British Journal of Educational Technology*, 41, 349–364. doi:10.1111/j.1467-8535.2009.00993.x
- Credé, M., & Phillips, L. A. (2011). A meta-analytic review of the Motivated Strategies for Learning Questionnaire. *Learning and Individual Differences*, 21, 337–346. doi:10.1016/j.lindif.2011.03.002
- Duncan, T. G., & McKeachie, W. C. (2005). The making of the Motivated Strategies for Learning Questionnaire. *Educational Psychologist*, 40, 117–128.
- Dunlap, J. C. (2005). Problem-based learning and self-efficacy: How a capstone course prepares students for a profession. *Educational Technology Research and Development*, 53(1), 65–85.
- Facione, P. A. (1990). *The Delphi Report. Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. Millbrae, CA: California Academic Press. ERIC No. ED 315 423.
- Gardner, J. W. (2012). Student-centred/personalized learning. In J. Parsons & L. Beauchamp (Eds.), *From knowledge to action: Shaping the future of curriculum development in Alberta* (pp. 217–238). Edmonton, Alberta, Canada: Alberta Education.
- Giddens, J., Hrabe, D., Carlson-Sabelli, L., Fogg, L., & North, S. (2012). The impact of a virtual community on student engagement and academic performance among baccalaureate nursing students. *Journal of Professional Nursing*, 28(5), 284–290. doi:10.1016/j.profnurs.2012.04.011
- Hannum, W. H., Irvin, M. J., Lei, P.-W., & Farmer, T. W. (2008). Effectiveness of using learner-centered principles on student retention in distance education courses in rural schools. *Distance Education*, 29(3), 211–229.
- Harpe, S. E., & Phipps, L. B. (2008). Evaluating student perceptions of a learner-centered drug literature evaluation course. *American Journal of Pharmaceutical Education*, 72(6), 1–6.
- Huba, M. E., & Freed, J. E., (2000). *Learner-centered assessment on college campuses: Shifting the focus from teaching to learning*. Boston, MA: Allyn and Bacon.
- Johnson, T. E., Archibald, T. N., & Tenenbaum, G. (2010). Individual and team annotation effects on students' reading comprehension, critical thinking, and meta-cognitive skills. *Computers in Human Behavior*, 26, 1496–1507. doi:10.1016/j.chb.2010.05.014
- Jonassen, D. H., Davidson, M., Collins, M., Campbell, J., & Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. *The American Journal of Distance Education*, 9(2), 7–26.
- Karimi, R., Elbarbry, F., & Fortner, J. (2011). Integrative student learning: An effective team learning activity in a learner-centered paradigm. *Innovations in Pharmacy*, 2(4), Article 57.
- Ke, F. (2010). Examining online teaching, cognitive, and social presence for adult students. *Computers and Education*, 55(2), 808–820. doi:10.1016/j.compedu.2010.03.013
- Ke, F., & Kwak, D. (2013). Constructs of student-centered online learning on learning satisfaction of a diverse online student body: A structural equation modeling approach. *Journal of Educational Computing Research*, 48(1), 97–122. doi: http://dx.doi.org/10.2190/EC.48.1.e
- Kek, M. Y. C. A., & Huijser, H. (2011). The power of problem-based learning in developing critical thinking skills: Preparing students for tomorrow's digital futures in today's classrooms. *Higher Education Research & Development*, 30(3), 329–341. doi:10.1080/07294360.2010.501074
- Kramer, P., Ideishi, R. I., Kearney, P. J., Cohen, M. E., Ames, J. O., Shea, G. B., Schemm, R., & Blumberg, P. (2007). Achieving curricular themes through learner-centered teaching. *Occu-*

- pational Therapy in Health Care*, 21(1/2), 185–198.
- Ku, H.-Y., Tseng, H. W., & Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior*, 29(3), 922–929. doi:10.1016/j.chb.2012.12.019
- Martyn, J., Terwijn, R., Kek, M. Y., & Huijser, H. (2014). Exploring the relationships between teaching, approaches to learning and critical thinking in a problem-based learning foundation nursing course. *Nurse Education Today*, 34(5), 829–835. doi:10.1016/j.nedt.2013.04.023
- Massouleh, N., & Jooneghani, R. (2012). Learner-centered instruction: A critical perspective. *Journal of Education and Practice*, 3(6), 50–59.
- McCombs, B. (2000, September). *Assessing the role of educational technology in the teaching and learning process: A learner-centered perspective*. Paper presented at the Secretary's Conference on Educational Technology: Measuring the Impacts and Shaping the Future, Washington, DC. Retrieved from <http://tepservers.ucsd.edu/courses/tep203/fa04/a/articles/mccombs.pdf>
- McCombs, B. (2015). Learner-centered online instruction. *New Directions for Teaching and Learning*, 144, 57–71. doi:10.1002/tl.20163
- McCombs, B., & Vakili, D. (2005). A learner-centered framework for e-learning. *Teachers College Record*, 107(8), 1580–1600.
- McCombs, B. L., & Whisler, J. S. (1997). *The learner-centered classroom and school: Strategies for increasing student motivation and achievement*. San Francisco, CA: Jossey-Bass.
- Michinov, N., Brunot, S., Le Bohec, O., Juhel, J., & Delaval, M. (2011). Procrastination, participation, and performance in online learning environments. *Computers & Education*, 56(1), 243–252. doi:10.1016/j.compedu.2010.07.025
- Omar, N. A. (2015). The use of collaborative learning to improve critical thinking of general certificate of education advanced-level psychology students: An experiment. *Research Journal of Applied Sciences*, 10, 594–597. doi:10.3923/rjasci.2015.594.597.
- Palloff, R. M., & Pratt, K. (2013). *Lessons from the virtual classroom* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Paulson, D. R. (1999). Active learning and cooperative learning in the organic chemistry lecture class. *Journal of Chemical Education*, 76, 1136–1140.
- Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ). Report No. NCRIPTAL-91-B-004 National Center for Research to Improve Postsecondary Teaching and Learning, Ann Arbor, MI. (ED338122).
- Rapoo, B. (2000). *The relationships among high-school students' perceptions of instructional practices, self-efficacy, and academic achievement in South Africa* (Doctoral dissertation). Northern Illinois University.
- Schafersman, S. D. (1991). An introduction to critical thinking. Retrieved from <http://www.freeinquiry.com/critical-thinking.html>
- Schreurs, J., & Al-Huneidi, A. (2011, September). Development of a learner-centered learning process for a course. In *Interactive Collaborative Learning (ICL), 2011 14th International Conference on* (pp. 256–263). IEEE.
- Semple, A. (2000). Learning theories and their influence on the development and use of educational technologies. *Australian Science Teachers Journal*, 46(3), 21–28.
- Sparrow, L., Sparrow, H., & Swan, P. (2000). Student-centered learning: Is it possible? In A. Hermann & M. M. Kulski (Eds.). *Flexible Futures in Tertiary Teaching*. Proceedings of the 9th Annual Teaching Learning Forum. Perth, Australia: Curtin University of Technology.
- Sulaiman, F. (2011). The effectiveness of problem-based learning (PBL) online on students' creative and critical thinking in physics at tertiary level in Malaysia (Unpublished doctoral dissertation). University of Waikato, Malaysia.
- Thomas, R. E. (1997). Problem-based learning: Measurable outcomes. *Medical Education*, 31(5), 320–329.
- Tiwari, A., Lai, P., So, M., & Yuen, K. (2006). A comparison of the effects of problem-based learning and lecturing on the development of students' critical thinking. *Medical Education*, 40(6), 547–554.
- Ware, H. B. (2006). *Learner-centered e-learning: An exploration of learner-centered practices in online and traditional instruction in higher education* (Doctoral dissertation). Louisiana State University and Agricultural & Mechanical College.

- Weimer, M. (2002). *Learner-centered teaching: Five key changes to practice*. San Francisco, CA: Jossey-Bass.
- Wohlfarth, D., Sheras, D., Bennett, J. L., Simon, B., Pimental, J. H., & Gabel, L. E. (2008). Student perceptions of learner-centered teaching. *Journal of Scholarly Teaching*, 3, 67–74.
- Yuan, H., Williams, B. A., & Fan, L. (2008). A systematic review of selected evidence on developing nursing students' critical thinking through problem based learning. *Nurse Education Today*, 28(6), 657–663.
- Yuksel, G., & Alci, B. (2012). Self-efficacy and critical thinking dispositions as predictors of success in school practicum. *International Online Journal of Educational Sciences*, 4(1), 81–90.
- Zhu, Y.-Q., Chen, L.-Y., Chen, H.-G., & Chern, C.-C. (2011). How does Internet information seeking help academic performance? The moderating and mediating roles of academic self-efficacy. *Computers & Education*, 57(4), 2476–2484. doi:10.1016/j.compedu.2011.07.006
- Zumbach, J., Hillers, A., & Reimann, P. (2004). Supporting distributed problem-based learning: The use of feedback mechanisms in online learning. In T. Roberts (Ed.), *Online collaborative learning: Theory and practice* (pp. 86–102). Hershey, PA: Information Science. doi:10.4018/978-1-59140-174-2.ch004