

Teacher-Centered Versus Student-Centered Teaching: Preferences and Differences Across Academic Majors

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Abstract. This empirical study examined preferences between teacher-centered and student-centered teaching methods and academic major with 507 undergraduate college students. Surveys were administered to the students that assessed their level of agreement with teaching methods utilized in the classroom. The results indicate that across all academic majors, students' preferences included a mix of teacher-centered and student-centered approaches, some of which include lecture with student interaction, demonstrations and practice, lecture with use of PowerPoint, free flowing classroom discussion, guest speakers, and games in the classroom. The least preferred teaching methods were predominantly teacher-centered and included the use of unscheduled quizzes, lecture with no visuals, lecture with handwritten notes, and watching a long film. Significant differences were obtained for preferred teaching methods between academic majors.

Keywords: teaching methods, teacher-centered, student-centered, academic major, college students

Students in college encounter different teaching techniques and strategies in their classes (e.g., lecture, group work, and demonstrations) that are aimed at motivating students and improving learning and academic performance (Dunlosky et al., 2013; Friesen, 2011; Tanner, 2013). While there is considerable debate about which teaching methods or strategies are best used in a college classroom, professors may choose how to deliver the content and establish learning outcomes for their courses (Crookes et al., 2013; Khalil & Elkhider, 2016; Shreffler et al., 2019). These teaching methods can differ significantly and take on different formats based on class size and level, educational philosophy, learning outcomes, student characteristics like personality and gender, content being taught, and even academic major (Akdemir & Özçelik, 2019; Carpenter, 2006; İlçin et al., 2018; Murphy et al., 2020). Given the wide variety of teaching methods, it is crucial that teachers focus on selecting methods that will engage students as well as increasing learning and retention (Alvarez-Bell et al., 2017; Bidabadi et al., 2016; Granjeiro, 2019; Tews et al., 2015). This study examined student preferences for teacher or student-centered teaching methods as well as differences in methods utilized in different academic majors.

Review of the Literature

Teaching Methods

The teaching methods utilized in the undergraduate classroom are frequently classified into two distinct and separate pedagogical categories: teacher-centered methods and student-centered methods (Garrett, 2008; Lightweis, 2013). The key difference between teacher-centered and student-centered pedagogy is the focus. Teacher-centered activities rely upon teacher input or output (lecture) and students work alone. The teacher provides the required information and students passively receive that information. The teacher controls the learning experience, and students tend to have fewer opportunities to interact with other students or think out loud (Emaliana, 2017; Serin, 2018).

Activities that are oriented toward the student (collaborating, communicating, interacting) are considered student-centered (Janor et al., 2013). The teacher is involved in the learning process and directs their learning. Students can work in pairs or groups, and they can interact and help others learn (Emaliana, 2017).

In the classroom, the teaching modality varies depending on the professor's level of comfort, class size, academic level, and discipline. Some disciplines like philosophy or theology may utilize teacher-centered methods like lectures to ensure retention of material, while other disciplines like nursing or exercise science may utilize student-centered methods like hands-on experiences or simulations to help students acquire knowledge and skills (Harder, 2010). In larger classes, lecture may be the chosen instructional strategy. Despite the academic discipline, understanding the differences between teacher and student-centered methods provides professors an opportunity to make informed decisions about how to deliver course content, increase student engagement and learning, and facilitate student achievement of course learning outcomes (Abeysekera, 2015).

Teacher-Centered vs. Student-Centered Methods Across Academic Majors

Across all disciplines, many studies that have attempted to answer the question of whether teacher-centered or student-centered methods are the ideal way to help students achieve learning outcomes (Barrett et al., 2018; Connell et al., 2016; Garceau et al., 2012; Prins, 2009). While significant research exists on the college professor's utilization of particular teaching methods, the findings on what methods achieve the best results in the classroom are varied (Marmah, 2014; Novelli & Fernandes, 2007).

According to Marmah (2014), amongst the variety of teaching methods, lecture is widely recognized as a traditional, teacher-centered method. However, the efficacy of the lecture method as a teaching strategy is mixed. Williams and McClure's (2010) study of 70 students enrolled in three separate sections of a leadership and service course used lecture, experiential learning, and public pedagogy (utilization of popular media) as teaching methods. Each section was taught using a singular method. The results indicated the lecture format was inadequate for imparting

leadership practices as compared to the student-centered experiential learning and public pedagogy. In contrast, Deslauriers et al. (2019) in a study of 149 physics students found that students felt they learned more in a lecture-based class versus one that used active learning strategies. However, the students also had a high level of agreement that active learning was a better test of their learning. Along those lines, Muganga and Ssenkusu (2019) found that teacher-centered methods defined as "lecture, handouts/slides/syllabus content, and teacher-directed reading/viewing" (p. 28), were more frequently used by professors than student-centered methods. Mathew and Pillai (2016) found that nursing students indicated that they preferred the lecture method as compared to peer teaching, demonstrations, or discussion.

Other studies on teacher-centered approaches in the classroom, like the use of films, have indicated mixed results. Moskovich and Sharf (2012) found that the use of films "facilitated high levels of self-involvement and cooperative learning" (p. 60). Derelioğlu and Sar (2010) indicate that if teachers encourage students to use films beyond just the traditional use, films can allow students to be active learners, make connections, think critically, and reflect about the content.

Another teacher-centered approach that has been extensively used in the classroom are quizzes (pop, weekly, or reading), primarily to get students to review, interact with the material, and enhance their learning. In a study of 55 philosophy students, Tropman (2014) found that 85% of the students reported a high or moderate level of desire to read course material as a result of required reading quizzes. Additionally, 89% of students indicated positive views of quizzes and "students also perceived quizzes to have a positive impact on their ability to engage in class discussion" (p. 141).

Across academic majors, the utilization of student-centered teaching methods is the preferred method for classroom instruction (Barrett et al., 2018; Bradford et al., 2016). Janor et al. (2013), in a study of five finance courses taught at a business school in Malaysia, focused on student-centered methods that included case studies, class discussions, group discussions, group projects, and student presentations. The researchers argued that these particular "teaching methods require students to enhance their teamwork skills, while applying knowledge to the 'real world' problems" (p. 114). Similar results were obtained by Prins (2009) who found that a "student-centered approach aided in their learning of the material" (p. 10).

To further illustrate the use of student-centered methods in the professions, Wehbi (2011) examined the effects on student learning using in-class experimental methods in a social work program. The results indicated that this method could expose students to a way of learning skills that could be used in a real-world setting. Furthermore, student reflections on their impressions of the experiential method and their learning outcomes were positive. In a study of 58 criminal justice majors, Bradford et al. (2016) found that student-centered methods like team-based learning, incentive-based learning, and the flipped classroom improved student learning and increased student engagement.

Curriculums in other academic majors like sport and exercise science may incorporate many student-centered instruction strategies and often utilize a blended approach (Barrett et al., 2018). Garceau et al.'s (2012) study of the instructional methods utilized by 165 professors teaching a biomechanics course determined that 80.9% of professors used active learning or interactive methodologies in their classroom for both lecture (teacher-centered) and laboratory (student-centered) sessions. In a study of exercise physiology students, Elmer et. al. (2016) found that 73% preferred to learn the basics before attending class to apply their understanding of class material. Thus, the utilization of both active teaching methods and carefully crafted activities will foster increasing a student's skills, allowing for improved clinical decisions as future exercise science practitioners. Other approaches using student-centered methods like experiential teaching methods are widely utilized in a variety of professional disciplines that include education, nursing, criminal justice, business, exercise science, and social work (Grant et al., 2016; Martin, 2010; Snow et al., 2019; Williams & McClure, 2010).

Ethical Approval

The current study was approved by the Institutional Review Board at the College. All students were informed about the nature and purpose and the risks and benefits of completing the study. Students completed an online informed consent prior to the administration of the surveys. Complete anonymity was maintained in the study.

Purpose of the Study and the Research Questions

Given the mixed research, this study seeks to examine preferences for teacher-centered and student-centered teaching methods across different academic majors. Specifically, the following research questions were investigated:

1. What are the students' most and least preferred teaching methods across different academic majors?
2. What are some significant differences between teaching methods (teacher-centered vs. student-centered) across different academic majors?

Methods

Participants

The study was conducted at a small, private liberal arts college in the Northeast. The survey was administered to 507 students and attempts were made to obtain data across class levels and student majors. There were 176 (34.7%) males and 331 (65.3%) females. The students ranged in age from 17 to 35 (mean age = 19.92, SD = 1.62). The mean age for males was 19.78 (SD = 1.28) and for females was 19.99 (SD = 1.77). There were 141 (27.8%) freshmen, 114 (22.5%) sophomores, 142 (28.0%) juniors, and 110 (21.7%) seniors. The students

represented eight academic majors and attempts were made to obtain a sample of majors that mirrored the composition of majors at the college (Table 1).

Table 1

Breakdown of Student Majors

Academic Major	Percent in the Present Study (n = 507)	Percent at the College (n = 1,127)
Business (n = 113)	22.3	18.2
Education (n = 30)	5.9	7.2
Social Sciences (n = 52)	10.3	10.1
Humanities (n = 10)	2.0	6.2
Sport and Exercise Science (n = 72)	14.2	19.7
Natural Sciences (n = 41)	8.1	15.4
Nursing (n = 176)	34.7	20.6
Undeclared (n = 13)	2.6	2.3

Measures

Demographic Information

Students were administered a demographic information questionnaire that asked about their age, gender, class level, academic major, and year of graduation.

Student Preferences for Teaching Methods

This section asked students to indicate their preferred teaching method by responding to the statement, "This is a teaching method that I prefer be used in the classroom by the Professor." There were 27 items, and students indicated their level of agreement to the items on a 5-point Likert Scale (1 = strongly agree, 5 = strongly disagree). The items for this section were adapted from research by Chamorro-Premuzic et al. (2007); Mathew and Pillai (2013); Novelli and Fernandez (2007); and Rivkin and Gim (2013). The 27 items were then organized into nine clusters: lecture (5 items), films (2 items), classroom discussion (4 items), experiential activities (2 items), games/demonstrations (2 items), student presentations (3 items), case studies (3 items), quizzes (3 items), and research (3 items).

Based on prior research (Garrett, 2008; Muganga & Ssenkusu; 2019; Smaldino et al., 2015), the 27 items were either identified as teacher-centered (e.g., lecture where professor talks with no visuals, watching a film), or student-centered (e.g., experiential activities, free flowing classroom discussion). In addition, the investigators' experience in different academic majors (i.e., business, sports and exercise science, and educational psychology) led to identifying some teaching

methods as a combination of both (e.g., lecture where professor talks with student interaction, demonstrations, and practice) (Table 2).

Table 2

Preferred Teaching Methods

Teaching Method	Teacher-Centered	Student-Centered
Lecture		
Lecture (professor talks) with no visuals	✓	
Lecture (professor talks) with handwritten notes	✓	
Lecture (professor talks) plus visual – PowerPoint	✓	
Lecture (professor talks) plus visual – overhead	✓	
Lecture (professor talks) with student interaction	✓	✓
Films		
Watching a short film – 20 minutes or less	✓	
Watching a long film – 20 minutes or more	✓	
Classroom Discussion		
Professor leads a classroom discussion on readings	✓	✓
Professor teaches by questioning students	✓	✓
Free flowing whole classroom discussion		✓
Guest speaker (related to course topic)	✓	
Experiential Activities		
All experiential activities – pairs		✓
All experiential activities – groups of three or more		✓
Games/Demonstrations		
Games in the classroom		✓
Demonstrations and practice	✓	✓
Student Presentations		
Individual		✓
Pair of students		✓
Groups of three or more		✓
Case Studies		
Individual participation		✓
Pair of students		✓
Groups of three or more		✓

Quizzes		
On the readings	✓	
Unscheduled quizzes	✓	
Weekly quizzes	✓	
Research		
Library research using experiential activities	✓	✓
Information search using technology	✓	✓
Course readings in the classroom	✓	

Results

Data were analyzed using IBM SPSS Statistics for Windows, Version 25 (IBM Corp., 2017). Descriptive and inferential statistics were conducted on the data.

Agreement with Preferred Teaching Methods by Academic Major

The data in Table 3 indicates the number of students who indicated the teaching method as their first, second, and third preferences. Across all academic majors, students indicated the highest level of agreement for teaching methods that involved both teacher and student-centered preferences or a combination of both like lecture with student interaction (a mix of teacher-centered and student-centered); demonstrations and practice where the teacher demonstrated skills and content (teacher-centered) while allowing students to practice those skills (student-centered); lectures with the use of PowerPoint or an overhead projector (teacher-centered); professor teaches by questioning students (a mix of teacher-centered and student-centered); and free flowing classroom discussion (student-centered). These preferred teaching methods involve direct instruction from the professor while providing students opportunities for skill acquisition, promoting active learning, and allowing teacher and student interactions as well as interactions among other students.

Table 3

Level of Agreement for Top Three Preferred Teaching Methods by Academic Major

Academic Major	First	Second	Third
Business (n=113)	Demonstrations and practice (n = 89)	Lecture (professor talks) with student interaction (n = 86)	Lecture (professor talks) plus visual – PowerPoint (n = 82)
Education (n=30)	Lecture (professor talks) with student interaction (n = 29)	Demonstrations and practice (n = 27)	Games in the classroom (n = 26)

Teacher-Centered versus Student-Centered Teaching 25

Social Sciences (n=52)	Lecture (professor talks) plus visual – PowerPoint (n = 46)	Demonstrations and practice (n = 44)	Lecture (professor talks) plus student interaction/Guest speaker (related to course topic) (n = 42)
Humanities (n=10)	Lecture (professor talks) with student interaction (n = 10)	Demonstrations and practice (n = 8)	Professor teaches by questioning students/Free flowing classroom discussion/case studies (individual participation (n = 7)
Sport and Exercise Science (n=72)	Demonstrations and practice (n = 65)	Lecture (professor talks) plus visual – PowerPoint (n = 62)	Lecture (professor talks) with student interaction (n = 58)
Natural Sciences (n=41)	Lecture (professor talks) plus visual – PowerPoint/Demonstrations and practice (n = 37)	Lecture (professor talks) with student interaction (n = 32)	Lecture (professor talks) plus visual – overhead (n = 31)
Nursing (n=176)	Lecture (professor talks) plus visual – PowerPoint (n = 161)	Demonstrations and Practice (n = 154)	Lecture (professor talks) plus visual – overhead (n = 142)
Undeclared (n=13)	Demonstrations and practice (n = 13)	Free flowing classroom discussion/Games in the classroom (n = 10)	Watching a short film – 2 minutes or less (n = 9)

The data in Table 4 indicates the number of students who selected their first, second, and third least preferred teaching methods. Across all academic majors, students indicated that their lowest level of agreement for teacher-centered teaching methods like unscheduled quizzes, lecture with no visuals, lecture with hand-written notes, guest speaker related to the course topic, and watching a short film. These teaching methods all share common characteristics across academic majors: they tend to be predominantly teacher-centered, they do not allow

students to connect information learned in the classroom to their real life, students are passive receivers of information, and they lack any teacher-student or student-student interaction in the classroom.

Table 4

Academic Major and Level of Agreement for Three Least Preferred Teaching Methods

Academic Major	First	Second	Third
Business (n=113)	Unscheduled quizzes (n = 98)	Lecture (professor talks) with no visuals (n = 66)	Library research using experiential activities (n = 57)
Education (n=30)	Unscheduled quizzes/Lecture (professor talks) with handwritten notes (n = 27)	Weekly quizzes (n = 18)	Lecture (professor talks) with handwritten notes (n = 10)
Social Sciences (n=52)	Unscheduled quizzes/Lecture (professor talks) with no visuals (n = 36)	Library research using experiential activities (n = 16)	Student presentations – groups of three or more (n = 12)
Humanities (n=10)	Unscheduled quizzes (n = 9)	Library research using experiential activities/Lecture (professor talks) with no visuals (n = 5)	Professor leads a classroom discussion on the readings/course readings in the classroom (n = 4)
Sport and Exercise Science (n=72)	Unscheduled quizzes (n = 53)	Lecture (professor talks) with no visuals (n = 49)	Watching a long film – 20 minutes or more (n = 31)
Natural Sciences (n=41)	Lecture (professor talks) with no visuals (n = 31)	Unscheduled quizzes (n = 29)	Professor teaches by questioning students/student presentations – groups of three or more (n = 12)
Nursing (n=176)	Unscheduled quizzes (n = 146)	Lecture (professor talks) with no visuals (n = 144)	Case studies – individual participation (n = 85)

Undeclared (n=13)	Unscheduled quizzes (n = 9)	Lecture (professor talks) with no visuals (n = 8)	Student presentations - individual (n = 4)
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Differences in Preferred Teaching Methods by Academic Major

A one-way analysis of variance (ANOVA) was conducted on the 27 items of the preferred teaching methods by academic major. The results indicated that statistically significant differences in preferences for teaching methods were obtained for 18 of the 27 items (Table 5).

A closer examination of the clusters/individual items of the teaching methods by academic major indicates statistically significant differences were obtained when using lecture as a teaching method. Business majors (mean = 3.64) indicated a greater preference for teacher-centered methods where the professor talks with no visuals than nursing students (mean = 4.15). Students in the natural sciences (mean = 2.12) had a greater preference for teacher-centered methods like lecture where professor talks with handwritten notes than students in the education major (mean = 3.03). Students in the nursing major (mean = 1.70) had a greater preference for teacher-centered methods like professor talks with a visual like PowerPoint over business majors (mean = 2.12).

For the films cluster of items, business majors (mean = 2.76) indicated a greater preference for teacher-centered teaching methods of watching a film that was 20 minutes longer than students in the nursing major (mean = 3.35). Social sciences majors (mean = 2.56) also indicated a greater preference for films 20 minutes or longer over nursing majors or sport and exercise science majors (mean = 3.24).

With the classroom discussion cluster of items for teaching methods, business majors (mean = 2.34) preferred student-centered teaching methods like free-flowing whole classroom discussion over nursing majors (mean = 2.85). Social science majors (mean = 2.15) also preferred free flowing classroom discussion over students in the nursing major (mean = 2.85). Sport and exercise majors (mean = 1.90) preferred guest speakers (related to course topic), which is a teacher centered teaching method, more than nursing (mean = 2.55) or natural science majors (mean = 2.63).

Significant differences were obtained for experiential activities, between students in the sport and exercise major (mean = 2.29), who preferred (student centered) activities in groups of three or more over students in the nursing major (mean = 2.87).

For student presentations, education (mean = 2.57) and social science majors (mean = 2.73) preferred individual presentations (student-centered) over students in natural sciences (mean = 2.85) or nursing majors (mean = 3.41).

With the research cluster of items, students in the natural sciences (mean = 2.54) and undeclared majors (mean = 2.54) indicated greater preferences for library research using experiential activities (a mix of teacher and student-centered teaching methods), while students in the sport and exercise major (mean = 2.46) preferred teaching methods like information search using technology (student centered) over nursing majors (mean = 2.29). Also, nursing students (mean = 2.69) preferred course readings in the classroom (teacher-centered) over students in the business major (mean = 2.98).

Table 5

Differences (Means, SD's, F values) between Preferred Teaching Methods by Academic Majors

Clusters and Items	1. Business	2. Education	3. Social Sciences	4. Humanities	5. Sport and Exercise Science	6. Natural Sciences	7. Nursing	8. Undeclared	F	Significantly Different pairs
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Lecture										
Lecture (professor talks) with no visuals	3.64 (1.07)	4.23 (.81)	3.85 (.95)	3.20 (.91)	3.83 (1.51)	3.85 (.93)	4.15 (.95)	3.77 (1.30)	3.84*	1-7
Lecture (professor talks) with handwritten notes	2.62 (1.00)	3.03 (1.06)	2.62 (.93)	2.10 (.73)	2.57 (1.07)	2.12 (.78)	2.49 (.98)	2.38 (.96)	2.71*	2-6
Lecture (professor talks) plus visual – PowerPoint	2.12 (.96)	2.10 (.54)	1.85 (.66)	2.10 (.73)	1.81 (.81)	1.68 (.65)	1.70 (.73)	2.15 (.80)	3.92*	1-7
Lecture (professor talks) plus visual – overhead	2.33 (.97)	2.17 (.69)	2.02 (.67)	2.10 (.73)	2.24 (1.09)	2.02 (.82)	2.03 (.78)	2.31 (.75)	1.57	
Lecture (professor	2.04	1.67 (.54)	1.85 (.87)	1.50 (.52)	1.82 (.81)	1.88 (.81)	2.01 (.98)	2.38	1.65	

Teacher-Centered versus Student-Centered Teaching 29

talks) with student interaction	(1.06)							(1.50)		
Films										
Watching a short film – 20 minutes or less	2.50 (.89)	2.20 (.92)	2.15 (.75)	2.40 (.84)	2.49 (1.07)	2.71 (1.09)	2.62 (1.07)	2.23 (.83)	2.13*	
Watching a long film – 20 minutes or more	2.76 (1.08)	2.83 (1.02)	2.38 (1.03)	2.90 (1.10)	3.24 (1.12)	3.17 (1.02)	3.35 (1.12)	2.69 (1.18)	6.57* *	1-7 3-5 3-7
Classroom Discussion										
Professor leads a classroom discussion on readings	3.01 (.99)	2.60 (1.00)	2.56 (.89)	3.00 (1.05)	2.67 (.98)	2.54 (.77)	2.86 (.95)	2.77 (.92)	2.26*	
Professor teaches by questioning students	2.69 (1.10)	2.63 (1.03)	2.42 (1.12)	2.20 (.63)	2.69 (1.03)	2.78 (1.10)	2.95 (1.21)	2.69 (1.03)	1.94	
Free flowing whole classroom discussion	2.34 (1.10)	2.10 (.92)	2.15 (.97)	2.50 (1.43)	2.37 (1.15)	2.54 (1.05)	2.85 (1.11)	1.82 (.95)	4.94* *	1-7 3-7
Guest speaker (related to course topic)	2.35 (.88)	2.33 (.84)	1.87 (.71)	2.60 (.96)	1.90 (.73)	2.63 (.91)	2.55 (.92)	2.38 (1.04)	7.01* *	3-6 3-7 5-6
Experiential Activities										
All experiential activities – pairs	2.47 (.95)	2.33 (.75)	2.37 (.95)	3.00 (1.15)	2.42 (.94)	2.56 (.89)	2.72 (1.04)	2.31 (1.10)	1.91	
All experiential activities – groups of three or more	2.50 (.97)	2.17 (.74)	2.37 (.95)	3.00 (1.15)	2.29 (.95)	2.63 (1.13)	2.87 (1.09)	2.46 (1.19)	4.29* *	5-7

Teacher-Centered versus Student-Centered Teaching 30

Games/Demonstrations										
Games in the classroom	2.27 (.84)	2.00 (.78)	2.17 (.81)	3.10 (.73)	2.24 (.86)	2.12 (.78)	2.39 (.91)	2.15 (.55)	2.59*	
Demonstrations and practice	2.03 (.72)	1.70 (.65)	1.85 (.66)	2.10 (.56)	1.88 (.71)	1.71 (.64)	1.94 (.69)	1.77 (.43)	1.71	
Student Presentations										
Individual	3.00 (1.12)	2.57 (.81)	2.73 (.97)	2.80 (.91)	2.90 (1.20)	2.85 (1.01)	3.41 (1.08)	2.92 (1.55)	4.77* *	2-7 3-7
Pair of students	2.58 (1.01)	2.33 (.88)	2.46 (1.01)	2.60 (1.17)	2.50 (1.08)	2.54 (1.07)	2.89 (1.06)	2.86 (1.28)	2.39*	
Groups of three or more	2.58 (1.09)	2.60 (1.13)	2.79 (1.10)	2.90 (1.19)	2.51 (.99)	2.83 (1.09)	2.84 (1.11)	2.69 (1.18)	1.10	
Case Studies										
Individual participation	2.80 (.89)	2.37 (.76)	2.44 (.75)	2.30 (.82)	2.63 (.86)	2.56 (.70)	2.77 (.91)	2.38 (.87)	2.29*	
Pair of students	2.53 (.90)	2.40 (.77)	2.42 (.84)	2.80 (1.03)	2.67 (.93)	2.46 (.84)	2.51 (.88)	2.38 (.96)	.65	
Groups of three or more	2.64 (1.12)	2.60 (.81)	2.69 (.97)	2.80 (.91)	2.90 (1.20)	2.85 (1.01)	3.41 (1.08)	2.92 (1.55)	.76	
Quizzes										
On the readings	2.91 (.89)	3.00 (1.05)	2.83 (.88)	3.10 (.99)	2.43 (1.20)	2.39 (.88)	2.59 (.86)	2.69 (.75)	3.43* *	
Unscheduled quizzes	4.19 (.93)	4.40 (.77)	3.96 (.90)	4.40 (.69)	4.10 (.98)	3.88 (1.00)	4.29 (.88)	3.62 (1.12)	2.49*	
Weekly quizzes	2.92 (1.00)	3.20 (1.12)	2.75 (.94)	2.70 (.82)	2.72 (.95)	2.37 (.88)	2.59 (1.05)	2.85 (.89)	2.81* *	
Research										

Library research using experiential activities	3.46 (.89)	3.10 (1.05)	3.10 (.88)	3.30 (.99)	3.17 (1.20)	2.90 (.88)	3.35 (.86)	3.00 (.75)	2.50*	
Information search using technology	2.76 (.86)	2.53 (.73)	2.54 (.77)	2.90 (.73)	2.46 (.80)	2.54 (.74)	2.99 (.90)	2.54 (.96)	4.58*	5-7
Course readings in the classroom	2.98 (.84)	2.90 (.88)	2.79 (.75)	2.40 (.84)	2.58 (.86)	2.54 (.77)	2.59 (.86)	2.69 (.75)	3.20*	1-7

* $p < .05$, ** $p < .01$

Note. 1= Strongly Agree, 5 = Strongly Disagree

Discussion

This study set out to examine preferences for teacher-centered and student-centered teaching methods in the classroom and academic major and has implications for teaching and learning in the classroom. The present findings indicate students' preferred teaching methods included a mix of some teacher-centered and student-centered approaches, or a combination of both. This includes lecture with student interaction, demonstrations and practice, and lecture with the use of PowerPoint, free flowing classroom discussion, and games in the classroom. The least preferred teaching methods were those that were predominantly teacher-centered, including unscheduled quizzes, lectures where the professor talks with no visuals, and watching a long film. Comparisons indicate significant differences for preferred teaching methods between academic majors.

Across all academic majors, students preferred teaching methods that involved both teacher-centered and student-centered teaching methods. These results indicate that students prefer teaching methods where the professor imparts the information in the classroom (using some visual), but also gives the students the opportunity to cover the content and apply and internalize the information by practicing the content and skills (e.g., through games, demonstrations, simulation scenarios, concept mapping, and problem-based learning) (Bidabadi et al., 2016; Costa, 2013; Xu, 2016).

Across all academic majors, students indicated their least preference for teaching methods that were teacher-centered like unscheduled quizzes, lecture with no visuals, and watching a long film (20 minutes or greater). Some academic majors may utilize lectures (without visuals or student interaction) as a primary teaching method; however, prior research indicates that students are passive learners and lose attention and focus, their retention of the material is lower, and they regurgitate answers (Marmah, 2014). Thus, it is imperative that professors not only impart knowledge, but actively work with students to reinforce and apply that knowledge in their academic major. While some research has found that

unannounced quizzes are an effective learning technique and can be beneficial and motivating in the classroom (Kamucho, 2007), they may also increase panic, stress, and anxiety for students (Wang, 2015), and further research is needed to determine if they work effectively across different academic disciplines.

The lower preference for library research using experiential activities was surprising. Typically, experiential activities (e.g., service learning, field experiences, internships) involve personal experiences that go beyond the classroom and allow students to observe and apply knowledge (York et al., 2010). Students are encouraged to seek out further connections by utilizing library resources that are directly relevant to the problem at hand by examining research reports as well as primary and secondary resources by bridging the gap between the classroom and the experiential activity (Spackman, 2016). When using library instruction in an Ancient Mediterranean Civilizations class, Dowling et al. (2018) found that some students had only a basic understanding of what primary and secondary sources were, and students did not have an understanding of tertiary or fact-finding sources. Thus, the lower preference for this teaching method may be explained by the students' lack of interest or commitment in seeking out additional information as well as their inability to be further involved in or reflect on the activity.

Differences were also observed in responses to teaching methods between academic majors, with students in the social science major indicating a greater preference for the use of films (a teacher centered method) than students in the natural sciences. While films can be a powerful educational tool that can generate interest in the subject matter being taught, very often it can also be seen by students as a time-wasting endeavor or one that a teacher uses when they are unprepared for class unless the teaching method is paired with some other assignment or activity that can assist students with successfully reconciling the material. In the classroom, teachers can also use student-centered teaching methods by pausing the movie to ask thought provoking questions to assist students in seeing connections among the movie, the theories being discussed, and real-life situations (Moskovich & Sharf, 2012) as well as using film clips to make the class engaging and help students learn and make connections (Levey, 2015).

For the classroom discussion cluster of items, students in the social science and sport and exercise science majors indicated a greater preference than students in the nursing major for a combination of both teacher-centered and student-centered approaches. Classroom discussion involves various components like free flowing discussion (student-centered), guest speakers related to the course topic (teacher-centered), professor leading a discussion, and teaching by questioning students (a combination of both teaching methods). For example, in the classroom, the use of a free flowing classroom discussion can appear chaotic, but if students are presented with hypothetical scenarios and asked specific questions like "why did this happen?", "what might you do here?," or "what would you do differently?," these interactive discussions (in any academic major) can allow students to see multiple points of view that they may not have considered, thereby letting students to effectively reconcile and connect material in the class to their lives (Kiernan & Lotter, 2019). Additionally, as a teaching method, classroom discussion can also

allow for higher level thinking by students to engage in collaborative discussions, examine issues logically, ask for clarifications, and reflect on assumptions.

Limitations, Future Research, and Conclusion

The results of the present study give rise to several issues for future research. There are a higher proportion of nursing majors in the study and a lower proportion of humanities and natural science majors. In addition, the professor's teaching style was not examined in the study as that can impact engagement in the classroom. Future studies should seek a more representative sample of academic majors as they examine teaching methods used in their classes as well as examining the professor's teaching to determine if they can modify their teaching style to meet the needs of all students in the classroom.

Based on this study's findings, several recommendations can be made for professors in the classroom. First, professors may use student-centered teaching methods in their classes, but sometimes these methods may not be successful, and students may indicate preferences for teacher-centered teaching methods where the professor can impart the knowledge and move on. Thus, we recommend that professors carefully consider and evaluate the efficacy of the teaching methods they use in their classes and utilize those that promote and ensure discussion, critical thinking, student participation, and active learning (Garrett, 2008).

Second, when using lecture as a teaching method, it is imperative that professors not only impart knowledge, but actively work with students to reinforce and apply that knowledge in their academic major. As an example, students in the sport and exercise science major should be encouraged to partner with other students to master skills taught (e.g., explaining and demonstrating an exercise). Students in the nursing major can practice individual skills (e.g., inserting an IV tube) but also be encouraged to participate in group work and projects, write short reflective papers, complete peer assessments (Hudson & Carrasco, 2015), and complete student journals to facilitate thinking reflectively and transfer skills into nursing practice (Marchigiano et al., 2010).

Third, it may be important to know what teaching preferences students have in the classroom. It is recommended that professors reflect on their individual styles and use this evaluation to experiment towards modification of their instruction to meet the needs of all their students.

Lastly, we recommend that professors examine their teaching methods across disciplines. Some disciplines may be more conducive to teacher-centered methods, while others may be more appropriate for student-centered methods. It is crucial to use the most effective teaching approach that allows students to connect and internalize information while ensuring student success in the classroom.

In conclusion, this study reveals that across academic majors, students prefer a mix of student and teacher-centered approaches and that some of those preferences will vary depending upon academic discipline. Professors and students

could benefit from utilizing both teacher and student-centered approaches in their classrooms to ensure student engagement and success. While this study provides useful information for classroom teaching, future research examining the relationship between student's preferences and attainment of learning goals is recommended.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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