

2022

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Recommended Citation

Feldhacker, M. L., & Feldhacker, D. R. (2022). Active Learning and Occupational Therapy Theory: A Mixed Methods Study of a Course Redesign. *Journal of Occupational Therapy Education*, 6 (4). <https://doi.org/10.26681/jote.2022.060403>

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Abstract

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Keywords

Course redesign, active learning, occupational therapy theory

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JOTE

Journal of Occupational
Therapy Education

Volume 6, Issue 4

Active Learning and Occupational Therapy Theory: A Mixed Methods Study of a Course Redesign

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ABSTRACT

The use of theory to guide practice is what distinguishes an occupational therapist's professional judgment and reasoning from simply technical skills. However, occupational therapists continue to lack confidence and skills in understanding application of theory to inform practice. Thus, effective course design related to theory is imperative in professional formation. This study assessed the effectiveness of a graduate-level occupational therapy theory course redesigned using andragogical, learner-centered, and active learning principles to address gaps in applying and understanding theory. A mixed methods retrospective cohort design was utilized. This included a pretest/post-test survey along with end-of-semester course and instructor evaluation. Eighty-four students engaged in the course and completed pre/post-testing and end of course evaluations. Course and instructor evaluations from an original (pre-redesign) cohort of 28 students were used for comparison. Results suggest that the course redesign was effective at helping students understand and apply occupational therapy theory in a real-world context while also being able to articulate the importance of theory-guided practice. Instructors should structure theory coursework around andragogical, learner-centered, and active learning principles to improve engagement and interaction with theoretical concepts. Results of this study can inform instructors in best practices and student preferences when instructing theory-related coursework and how to create learning opportunities which have distinct value in creating occupational therapy practitioners who are confident in utilizing theory to inform practice decisions.

Introduction

The use of theory to guide practice is what distinguishes an occupational therapist's professional judgment and reasoning from technical skills alone. Graduate-prepared occupational therapists must be able to "evaluate and choose appropriate theory to inform practice" (Accreditation Council for Occupational Therapy Education [ACOTE], 2018, p. 1). Despite this requirement, therapists continue to report ranging levels of confidence in applying theory, with fieldwork students and new practitioners reporting a lack of confidence and understanding in doing so (Ikiugu, 2012; Robertson & Griffiths, 2009). According to a study by Robertson and Griffiths (2009), new graduates identified difficulty justifying their actions from a theoretical perspective when using different theories in practice than those learned in school or when learning theories after practice skills. In a similar study by Towns and Ashby (2014), third-year occupational therapy students had difficulty "distinguishing between different forms of theoretical knowledge" (p. 344) and felt a disconnect between theory in their studies and application to practice. Given the importance of theory in distinguishing occupational therapy practitioners as professionals and in guiding their professional practice decisions, occupational therapy educators must seek to teach theory in a way which addresses the continued gap in confidence, knowledge, and skills to apply theoretical concepts to professional practice.

The purpose of this mixed methods study was to assess the effectiveness of a graduate-level occupational therapy theory course redesign which used andragogical, learner-centered, and active learning principles to address gaps in applying and understanding theory. Prior studies have concluded that students struggle to connect theoretical content and practice (Ikiugu, 2012; Robertson & Griffiths, 2009; Towns & Ashby, 2014). This relates directly to the principles that adult learners require hands-on learning experiences to explicitly see the link between what they are learning and real-life application. In this case, adult, graduate-level occupational therapy students need active theoretical learning experiences to bridge the gap between theory in the classroom and theory in real-life application during practice.

Literature Review

Andragogy

Adult learning, or andragogy, is unique when compared to learning in childhood and adolescence. Establishing appropriate theoretical approaches to account for differences in learning is critical to tailor instruction and content to meet adult learner needs. Merriam and Bierema (2014) described adult learning experiences as those that "fully engage the participants through a variety of activities, value the participants' contributions, and enable participants to learn from each other as well as gain personal expertise" (p. 44). Within this andragogical approach to learning, fundamental principles outline methods for creating significant learning experiences among adults: "(1) The learner's need to know, (2) self-concept of the learner, (3) prior experience of the learner, (4) readiness to learn, (5) orientation to learning, and (6) motivation to learn" (Knowles et al., 2015, pp. 4-5). These assumptions and principles of andragogy highlight the value of an adult learner's previous experiences and their desire to learn, actively engage with, and apply material.

Graduate-level, master's or doctoral, occupational therapy students are adult learners. However, approaches to instruction of these students do not always utilize adult educational theory. Traditional pedagogical approaches intend to transfer content from a central instructor to students but may lack in the ability to create rich learning experiences required for adult, professional students (Knowles et al., 2015). While these may be effective for test scores of fact-focused concepts, such as basic sciences, they are less effective for applied and practical teaching (Danielson et al., 2014). Adjusting approaches to better reflect learner needs and preferred styles promotes effective, life-long learning. These approaches create students who are ready and motivated to learn, who care about the content beyond the classroom, and who are prepared for the complexities of clinical practice (Fink, 2013; Knecht-Sabres et al., 2013; Knowles et al., 2015; Merriam & Bierema, 2014).

Experiences

Andragogical learning opportunities draw upon the life experiences of students. Tying course content to these situations improves students' abilities to connect and directly apply the content (Knowles et al., 2015; Merriam & Bierema, 2014). Experiences provide not only a foundation for learners to draw upon when encountering a new learning situation but also an opportunity to stimulate additional learning (Knowles et al., 2015; Merriam & Bierema, 2014). Building of new learning upon past experiences is a foundational concept used in active learning approaches. To do this, instructors serve as facilitators for connecting prior experiences to new concepts and theories (Beausaert et al., 2013; Merriam & Bierema, 2014).

An example of connecting these previous experiences to new knowledge can be seen in Kolb's Experiential Learning Cycle (1984; Kolb & Kolb, 2017). According to Kolb (1984) and Kolb and Kolb (2017), teaching and experiential learning should include four abilities of the learner: Concrete experience abilities, reflective observation abilities, abstract conceptualizing abilities, and active experimental abilities. Each of these abilities includes a variety of teaching techniques. Concrete experience abilities manifest when recalling past experiences, role playing, demonstrating, observing, completing case studies, and watching videos (Kolb, 1984; Kolb & Kolb, 2017; Merriam & Bierema, 2014). Reflective observation abilities are seen in small and large group discussion and reflection and creation of questions while abstract conceptualizing abilities are required for more didactic techniques such as lectures and readings. Lastly, active experimental abilities use techniques such as role playing, individual or group projects, and problem-solving activities (Kolb, 1984; Kolb & Kolb, 2017; Merriam & Bierema, 2014). Course designs which integrate experiential active learning strategies, such as discussion, role playing, case studies, and projects allow the opportunity for learners to apply their personal experiences to relevant practice, thus creating additional knowledge in a new way (Merriam & Bierema, 2014).

Real Life Application

In facilitating significant learning experiences, instructors of adult learners must be explicit in outlining reasons for learning including the content, why knowing it is necessary, and how it applies to students' lives (Merriam & Bierema, 2014). In the case of occupational therapy students, these adult learners are in the process of gaining knowledge and skills in preparation for practice as occupational therapists. For these students, real life application and "the need to know" (Merriam & Bierema, 2014, p. 55) should guide instructors in selecting relevant and practical active learning activities which can directly be seen in and applied to occupational therapy practice (Knecht-Sabres et al., 2013). Explicit explanation of how in-class active learning activities and discussions will be applied in future practice can improve student motivation and engagement and allows instructors to demonstrate, very realistically, how theory guides practice.

Learner-Centered Teaching and Active Learning

Learner-centered teaching focuses on engaging and empowering students in the learning process, encouraging collaboration and a classroom community, promoting reflection about what and how students are learning, and explicitly discussing the learning process (Weimer, 2013). According to Weimer (2013), this approach builds student self-efficacy in practical skills through learner-chosen activities, enhancing student engagement and confidence.

In addition to learner-centered strategies, active learning strategies have also been shown to increase student engagement and understanding. Active learning occurs when students are physically and mentally engaged in activities that involve thinking, problem solving, and reflection (Collins & O'Brien, 2003; Michael, 2006; Weimer, 2013). These "hands-on and minds-on experiences" (Benjamin, 1991, p. 70) encourage students to make learning a personal process by combining what they already know with new information, creating their own meaning (Weimer, 2013). Most practically and actively, "in order to successfully transfer knowledge from one situation to another, students need to practice" (Weimer, 2013, p. 40). Making personal connections with the material, learning with peers, and practicing skills, all with hands-on learning activities, further deepen the impact of active learning activities.

Active learning approaches do not often utilize traditional lecture during classroom time, since lecture places students in a passive role during the learning experience (Benjamin, 1991; Gilboy et al., 2015). Recent studies have shown that integrating active learning has significant learning improvements over traditional lecture only. In a study by Freeman et al. (2014) comparing active learning sections of science, technology, engineering, and math (STEM) classes with lecture only sections, the examination scores in active learning sections significantly improved by 6%, and students in lecturing sections were 1.5 times more likely to fail. Another study by Pederson (2010) found active and collaborative learning through groups in a sociological theory course to be an effective learning tool that was beneficial for students.

Active learning does not mean, however, that lecture to summarize and convey content cannot be used. Instead, it suggests that classroom time focus more on actively interacting with the content to apply it and learn about it through the process of engagement. An approach which bridges a need for content while promoting active learning is use of a flipped classroom. Flipped classroom consists of the student reversing what they would normally complete in and outside of the classroom (Gilboy et al., 2015). This method ensures that hands-on and learner-centered instruction occurs in the classroom, while foundational knowledge is provided outside of the classroom via readings or recorded lectures. This model supports the role of the instructor as a facilitator rather than a content expert, as in-class time is spent guiding students in application of important concepts (Gilboy et al., 2015; Hmelo-Silver, 2004). Flipped classroom approaches have been found effective among pharmacy, medical, and dental students, with significant improvements in exam and quiz scores over typical lecture as well as positive student perception and preference of a flipped classroom over traditional lecture (Cotta et al., 2016; Lee & Kim, 2018; Thaman et al., 2013).

Course Redesign

Guided by principles of andragogy, learner-centered teaching, and active learning, an occupational therapy theory course within an entry-level doctorate program was redesigned. The course redesign was prompted by student feedback in end of course evaluations which rated the overall course as a 3.11 on a scale of 1-5, with 1 being poor and 5 being excellent. Qualitative student feedback was indicative of a struggle to understand theoretical topics and to apply them to practice. Prior to the redesign, the course used a traditional lecture format, primarily conducted through student presentation with some in-class discussion. The redesign focused on meeting the needs of adult occupational therapy learners by integrating effective teaching strategies to address the gap of students' and practitioners' confidence and skills in using theory to guide professional practice decision making. As such, the goals of the course redesign were to increase student competence and confidence in practical theory application as well as increase student understanding of theory, not only *that* theory guides practice but *how and why* theory guides practice. Instructors strategically designed experiences to build knowledge and skills through reflection and meaning-making using active engagement (Boyt Schell & Schell, 2008).

In the course redesign, all students prepared for a given class session by completing required readings and watching a short, recorded lecture in a flipped classroom format, both which covered basic knowledge of the session's content. Small groups of three to five students were assigned two theories, one model of practice (MOP) and one frame of reference (FOR). Their group role, in collaboration with the course instructor, was to apply the assigned theory to a case study and assist in creating and leading in-class active learning activities. Prior to the class session, student small groups met with the course instructor to review the theory and plan the active learning activities to be used in class. During class sessions, the small groups presented the case to which they applied their assigned theory, reviewed the overarching concepts of the theory reflected in the assigned case, and led interactive, hands-on learning activities for their peers. Some of the hands-on activities included small and large group discussion, games,

video demonstrations, case studies, use of assessments and interventions commonly seen in occupational therapy practice, reflections, and role playing. This format encouraged learners to be central to the process by assisting in creating the learning activities and allowed the instructor to become a facilitator and guide of that process. In addition, students engaged in peer-to-peer teaching and learning, as the small group of students became more “expert” on their assigned theory. Most importantly, the new design focused on providing all students the opportunity to actively engage in real-life and practical application of the material to better connect and understand how theory guides occupational therapy practice.

This course has been implemented by two different instructors, using the same format, among three cohorts of students. The purpose of this study was to evaluate the effectiveness of using an andragogical, learner-centered, active learning approach to teach graduate-level students about occupational therapy theory.

Methodology

Research Design

A mixed methods retrospective cohort design was utilized. This included a course and instructor evaluation completed as part of normal end-of-semester procedures and a pretest/post-test survey collected to evaluate teaching effectiveness as part of the course redesign. For the student responses gathered as part of the course and instructor evaluation, a retrospective thematic analysis was completed. This design allowed us to review data that were already collected for course redesign, accreditation, and evaluation purposes.

Participants

Graduate occupational therapy students from a midwestern university who were enrolled in the redesigned theory course were included in this study. The original course (prior to the redesign) was taught in a lecture format in spring 2017 (28 students). The redesigned course was then taught in the same format for three consecutive course offerings (84 students): Fall 2017 (30 students), spring 2019 (31 students), and fall 2019 (23 students). Students from the redesigned course ranged in age from early-to-mid-20s to early-40s, with 72 females and 12 males overall.

Data Collection

Instruments/Measures

Both the pretest/post-test survey and course and instructor evaluation instruments were used to collect data from the course redesign. For students in the original course, course and instructor evaluations were available for comparison.

Pretest/Post-test Survey. A pretest/post-test survey of ACOTE standards to be addressed in the course was designed to assess teaching effectiveness. This was originally created based upon 2011 Standards which were consolidated but consistent with the revised 2018 Standards, identified in Table 1. The survey included six items,

outlined in Table 1. Students responded to each item on a 5-point, Likert-type scale: 1=strongly disagree to 5= strongly agree. Survey data were analyzed for internal consistency reliability using Cronbach's alpha. According to Gliem and Gliem (2003), Cronbach's $\alpha < .5$ is considered to be poor internal consistency reliability, .6 is considered questionable, .7 indicates acceptable internal consistency reliability, and .8 or above is considered good internal consistency reliability. The pretest/post-test survey indicated good internal consistency reliability with $\alpha = .85$.

Table 1

Pretest/Post-test Survey Questions and Aligning 2018 ACOTE Standards

Number	Statement
Question 1	At this time, I am able to demonstrate knowledge and understanding of the concepts of human behavior to include the behavioral sciences, social sciences, and occupational science. [B.1.1]
Question 2	At this time, I am able to articulate an understanding of the importance of the history and philosophical base of the profession of occupational therapy. [B.3.1]
Question 3	At this time, I am able to analyze, synthesize, and apply models of occupational performance and theories of occupational performance. [B.2.1]
Question 4	At this time, I am able to compare and contrast models of practice and frames of reference that are used in occupational therapy. [B.2.1]
Question 5	At this time, I am able to analyze and discuss how occupational therapy history, occupational therapy theory, and the sociopolitical climate influence practice. [B.3.1]
Question 6	At this time, I am able to discuss the process of theory development and its importance to occupational therapy. [B.2.2]

Course and Instructor Evaluation. A course and instructor evaluation, designed for use at the end of all occupational therapy courses, was used for data collection. The evaluation was administered anonymously by university administration; individual responses were compiled and returned to instructors. The two-part evaluation consisted of Likert-type survey questions and student responses to two prompts. Survey questions related to general course structure, instructor responsibilities and skills, contribution to learning, and overall quality of the course, with 23 items overall. Participants rated each item using a 5-point, Likert-type scale: 1=strongly disagree to 5=strongly agree. Following the survey questions, qualitative responses were collected when students were asked to identify one to two aspects of the course that were most useful or valuable for learning and one to two areas that could be improved with suggestions for improvement for each. Psychometric properties for this evaluation have not been established. However, the evaluation was created based upon the IDEA evaluations which have generally supported validity and reliability (Benton & Li, 2015).

Procedures

Approval from the university's Institutional Review Board (IRB) was obtained. The informed consent process was waived due to the retrospective nature of the research. Students completed the pretest/post-test at the beginning and end of each cohort of the course. In addition, the course and instructor evaluations were conducted at the end of each cohort, as required by the university and department. Course evaluations were also available for one cohort prior to the redesign (Spring 2017), which were used for comparison. The comparative cohort, prior to redesign, was instructed by the principal investigator (DF). The course was redesigned by the principal investigator (DF), and each of the three cohorts who participated in the redesigned course was instructed by one of the two investigators (DF, MF) who collaborated to ensure similar procedures.

Data Analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 27). Data included pre/post-test survey results as well as the quantitative portion of course and instructor evaluations. For the pre/posttest survey, descriptive statistics and frequencies were first computed for all questions to evaluate characteristics for pre-posttest responses. Next, a Wilcoxon Signed Rank test for paired experiment was completed to assess for differences between pre-test and post-test survey responses by question. Differences between gender and cohort were assessed by splitting the data. Finally, statistical evaluation of relationship between posttest survey response and final grade in the course (by overall percentage) was performed using Spearman's correlation, due to the ordinal nature of the data. Significance was set at $\alpha=.05$. For the quantitative portion of course and instructor evaluations, descriptive statistics were computed for mean and standard deviation of the three combined cohorts. These same metrics were calculated from course and instructor evaluations completed by the cohort prior to the course redesign; these were used for comparison with redesign data. Kruskal-Wallis was used to assess for differences between cohorts. For all analyses, nonparametric statistics were chosen due to the ordinal nature of the data.

Qualitative data were collected from students' written responses on the course and instructor evaluations for the three cohorts who participated in the redesigned course. Student narrative responses were reviewed by the two investigators, and data were initially coded openly using Saldana's (2016) methodology. Coding was reviewed and compared between investigators and then categorized according to repeated and emerging ideas to draw connective themes and subthemes. Interrater review of thematic data through reflexivity reduced potential bias.

After separate analysis of quantitative and qualitative data, the data were integrated using the triangulation protocol developed by Farmer et al. (2006). Triangulation provided a clearer and broader interpretation of the data. Steps of this protocol include (1) sorting the findings, (2) comparing findings to determine the degree and type of convergence, (3) comparing all segments through a global assessment, (4) comparing the nature and scope of data for completeness, and (5) comparing findings among researchers to determine agreement. For convergence coding, the coding scheme was as follows:

- Agreement: Full agreement between both sets of results for meaning and prominence
- Partial agreement: Agreement on one but not both components of meaning and prominence
- Silence: One set of results covers the theme but the other is silent
- Dissonance: Disagreement between the sets of results on both elements of comparison, meaning and prominence

Results

Quantitative

Pretest/Post-test Survey

All 84 students (fall 2017, $n=30$; spring 2019, $n=31$; fall 2019, $n=23$) completed pretesting, while 79 completed post-testing (fall 2017, $n=27$; spring 2019, $n=30$; fall 2019, $n=23$). One student's data was excluded from posttest analysis for questions 2 and 5 because it was incomplete. Quantitative data analysis sought to answer the research questions of effectiveness of an andragogical, learner-centered, active learning approach to teaching graduate-level students about occupational therapy theory. Frequency results indicated a general increased number of students rating their learning higher from pretest to posttest for each of the course objective questions on the survey. Average student responses for all pretest questions were in the range of "disagree" (rating=2) to "neutral" (rating=3) while at posttest they were "agree" (rating=4) to "strongly agree" (rating=5).

Pairwise comparisons between pre- and posttest means revealed a statistically significant improvement for all questions ($p=0.000$; see Table 2). When data were split by gender and cohort, results remained statistically significant for all groups ($p<0.05$ and $p<0.000$, respectively).

Table 2

Differences in Means by Question of Pretest/Post-test Survey

	Pretest (Mean \pm SD)	Posttest (Mean \pm SD)	p- value
Question 1 <i>Demonstrate Knowledge</i>	2.68 \pm .87	4.35 \pm .51	0.000*
Question 2 <i>Articulate Importance</i>	2.32 \pm .89	4.38 \pm .59	0.000*
Question 3 <i>Analyze, Synthesize, and Apply</i>	2.04 \pm .81	4.42 \pm .50	0.000*
Question 4 <i>Compare and Contrast</i>	2.00 \pm .73	4.41 \pm .54	0.000*
Question 5 <i>Analyze and Discussion Practice Influence</i>	2.10 \pm .85	4.37 \pm .56	0.000*
Question 6 <i>Discuss Development and Importance</i>	2.04 \pm .81	4.32 \pm .54	0.000*

Note. *Indicates significance with $p<.05$

Correlational analyses were used to determine if there was an association between student responses on the survey and their performance in the course, as measured by overall grade. The average course grade (by percentage) was $89.7\% \pm 4.35\%$ ($n=84$). The minimum grade was 74.72% and the maximum was 96.31%. Correlational results indicated no significant association between survey responses and final grade ($p>0.05$).

Course and Instructor Evaluation: Survey Questions

Twenty-eight students from the original theory course (spring 2017) and all 84 students from the redesigned course completed the course and instructor evaluations. Cohorts of the redesigned course were compared, and there were no significant differences between cohorts ($p=.368$ all comparisons). Descriptive averages from the original pre-redesign cohort were compared with those of the combined redesign cohorts with a noted trend of improvement among the redesign (see Table 3). Average student rating of overall course quality changed by almost an entire point (original pre-redesign cohort= $3.11 \pm .57$ and redesign cohorts= $4.10 \pm .05$).

Table 3

Average Course Evaluation Ratings for Original Pre-Redesign and Combined Post-Redesign Cohorts

	Original Pre-Redesign Cohort (Mean \pm SD)	Combined Redesign Cohorts (Mean \pm SD)
General Structure (Questions 1-6)	3.96 \pm .35	4.53 \pm .02
Instructor Responsibilities and Skills (Questions 7-14)	3.95 \pm .34	4.64 \pm .08
Contribution to Learning (Questions 15-22)	3.99 \pm .33	4.41 \pm .09
Overall Quality (Question 23)	3.11 \pm .57	4.10 \pm .05

Next, course evaluations were compared by question between all four cohorts (spring 2017, original pre-redesign; fall 2017, spring 2019, and fall 2019 post-redesign). Results are shown below in Table 4. As noted in the table, many questions which were directly targeted with the redesign (e.g., questions 3, 4, 8, 9, 12, 13) were significantly different between groups. Pairwise comparisons were conducted between all four cohorts for questions with significant differences, and results indicated a significant difference between the original pre-redesign cohort and each of the three redesigned cohorts for all questions. There were no significant differences between post-redesign cohorts.

Table 4

Between Group Comparisons for Four Cohorts (Original Pre-Redesign [Spring 2017] and Post-Redesign [Fall 2017, Spring 2019, Fall 2019])

Number	Statement	Overall p-value
General Structure		
Question 1	The course syllabus was comprehensive, clear, and accurate.	.230
Question 2	The learning objectives for the course were clearly stated.	.196
Question 3	Course activities encouraged the application of knowledge.	<.001*
Question 4	The assignments and activities enhanced my learning.	<.001*
Question 5	This course was well organized.	<.001*
Question 6	This course required an appropriate amount of work to meet the course objectives.	.054
Instructor Responsibilities and Skills		
Question 7	The instructor was well-prepared and organized.	.010*
Question 8	The lectures and learning sessions were well prepared and organized.	<.001*
Question 9	The instructor promoted discussion in class.	.004*
Question 10	I found the instructor helpful when I had difficulty understanding concepts.	.004*
Question 11	The instructor provided timely and meaningful feedback on assignments.	.105
Question 12	The instructor for this course facilitated an environment conducive to learning and participation.	<.001*
Question 13	Overall, the instructor was an effective component in my ability to meet the learning objectives of the course.	<.001*
Question 14	Overall, the instructor presented a high-quality learning experience.	<.001*
Contribution to Learning		
Question 15	The goals and objectives for the course were achieved.	<.001*
Question 16	The relevance of this course to occupational science, occupational therapy, & occupational therapy practice was emphasized appropriately.	.038*
Question 17	The online course materials added to my learning.	.057
Question 18	This course assisted my ability to develop and apply critical thinking skills and clinical reasoning skills.	.002*
Question 19	My understanding of occupational science, occupational therapy, & occupational therapy practice has improved as a result of participating in this course.	<.001*
Question 20	As a result of this course, I have become more competent in this area.	.001*
Question 21	This course promoted the development of independent learning skills.	.013*
Question 22	If applicable, this course demonstrated a respectful approach to interdisciplinary learning/practice.	.004*
Overall Quality of the Course		
Question 23	Please evaluate the course overall.	<.001*

Qualitative

Qualitative data sought to answer the research question of effectiveness of the andragogical, learner-centered, and active learning approaches through analysis of student comments on the qualitative portion of the course and instructor evaluations. All 84 students within the redesigned theory course completed the qualitative portion of the evaluations. Open coding and analysis of their responses revealed four themes: *Learning core concepts, deepening understanding with active learning, application to real-life practice, and perception of course design*. The theme of *learning core concepts* had subthemes of *flipped classroom format* and *student group presentations*. The theme of *deepening understanding with active learning* had subthemes of *case studies with discussion*, and *interactive activities*. Finally, the theme of *perception of course design* had subthemes of *course structure/layout* and *student feelings*. Results from each theme and subtheme are presented below with additional supporting student statements in Table 5.

Theme 1: Learning Core Concepts

Students reported that an introduction to the material using the flipped classroom format and student group presentations was effective for learning core concepts. Within the first subtheme of flipped classroom, students appreciated the ability to review recorded lecture content at their own pace, often reporting that they could pause, take notes, and rewatch as needed to clarify content. Specifically, the ability to rewatch challenging theoretical concepts was noted by multiple students as helpful to improving their understanding and information retention. Students also noted that the flipped classroom format allowed them to come to class prepared to engage in active learning and apply the core concepts of the theories. One student summarized the benefits of flipped classroom by sharing that “it allowed more freedom in the way I learned the material and helped me apply it in the classroom setting.”

The second subtheme of learning core concepts was student group presentations. Students reported that this peer learning and teaching model benefitted both the audience and the presenters in unique ways. Students in the audience appreciated learning from their peers as they presented a case study and led the active learning activities. Students discussed the benefit and helpfulness of the group presentations in “learning it [the material] in a way that I can remember.” Students also felt that learning from peers made the learning more interactive and application-based. When presenting on their assigned theories, students reported they gained a better understanding of those specific theories and that the presentations were a “useful and fun way of learning.” Through the process of student-led teaching and learning, students were able to engage with the core concepts of the course in a more active way rather than passively learning from the instructor.

Theme 2: Deepening Understanding with Active Learning

After learning core concepts from flipped classroom recordings and student group presentations, students reported that active learning strategies such as case studies with small and large group discussions and interactive activities (both subthemes of this theme) helped deepen their understanding of theoretical concepts. Case studies, often

used in the form of videos and occasionally in form of observation of peers, helped students apply material directly to a real person and/or situation. Students reported these “real life applications” were “helpful in learning.” Students also reported that use of case studies facilitated learning through expression of ideas in response to the presented scenario, as one student reported that “evaluating case studies with groups was helpful in facilitating my learning/expressing my thoughts and viewpoints.” Small and large group discussion following review of a case study also helped to deepen understanding. Students were often asked to share their experience, perception, and questions and to respond to peers in a collaborative way. Students noted that the instructors’ facilitation of discussion helped students better understand concepts through sharing their opinions and explaining concepts to peers. One student stated that “peer discussion ... helped me to solidify concepts as I explained them to others as well as learn from others’ explanations of course concepts.” Students found that engagement in case-study-based discussions helped with overall learning and understanding of content.

The final subtheme of interactive activities proved to be one of the most meaningful ways that student understanding of theoretical concepts was deepened. Students reported that classroom activities, which were intentionally active and interactive, allowed students to see and better understand how theory applies to and guides occupational therapy practice. The hands-on nature of these activities allowed students to actively and immediately engage with the material and concepts they had just learned. Students used phrases such as “solidify the concepts of theory in my mind,” “apply the material I was learning,” and “understand the material deeper” to describe the role these interactive activities played in their learning. One student elaborated on this further by stating, “I also found the in-class activities great for associating and seeing how each MOP and FOR worked in practice. An example would be how being able to actually see the difference between biomechanical and rehabilitative FORs instead of just hearing about them through lecture.” It was these interactive activities that students reported being most beneficial to their learning.

Theme 3: Application to Real-Life Practice

Expanding upon the previous themes, student feedback revealed the theme of *application to real-life practice*. Similar to discussion about case studies and interactive activities, students reported that applying theoretical concepts and activities to occupational therapy practice scenarios made theory more relevant to real life. Additionally, this application to real-life practice allowed students to better understand both *how* and *why* theory was relevant to practice. Students reported increased knowledge of the practices and unique viewpoints of our profession through application activities. Students also appreciated seeing how theory provided a foundation for assessments and interventions “we will be using when we are working as OTs [occupational therapists].” One student reported, “I like how we did activities after learning about each model of practice and frame of reference. That helped correlate all

of the information we learned into real life practice.” By using case studies, interactive activities, and discussion topics rooted in occupational therapy practice, students regularly applied the material to real-life in a natural way, leading to a more intuitive connection between theory and practice.

Theme 4: Perception of Course Design

Finally, student comments provided insight on their perception of the course design. Course structure/layout and student feelings were two subthemes revealed within the course design theme. As alluded to in previous themes, students appreciated how the format of the course included multiple modes of learning with diversity of learning activities. Being exposed to and learning the material in a variety of ways helped students increase their understanding and apply course content. Students recognized the benefit of the interactive and application-based approach, often reporting they learned the material better than other approaches they had experienced. One student stated, “I’m not someone who learns well from just lectures/exams, so having a wide variety of learning experiences really helped me to learn and apply the material,” which demonstrates positive perception of the course design in relation to overall learning.

Within this theme, comments provided by students often included their feelings about the course. When discussing their overall learning, students reported general feelings that the course design was beneficial, helped with understanding, and promoted learning through its organization/structure. Students also shared they “enjoyed” the class and found it “fun.” One student reported, “I loved how after each FOR/MOP presentation, we actually got to practice some of the concepts we learned – that was hugely beneficial for me and made class really fun!” These specific student feelings also supported a positive perception of the course design as a whole.

Through the coding and theming process, it was evident that student comments supporting one theme or subtheme simultaneously supported others. For example, the previous student comment about class being “really fun” linked the value students found in application of concepts with feelings of enjoyment and benefit for their learning. Similarly, another student reported, “I enjoyed the presentations with the activities. I think it was helpful to learn about the model then immediately apply it. This technique really helped me understand the material deeper,” which connected themes and subthemes of application, group presentations, and interactive activities. It is through the connection of these four themes and corresponding subthemes that student responses demonstrated the effectiveness of the course redesign.

Table 5*Themes and Subthemes with Additional Supporting Student Statements*

Theme 1: Learning Core Concepts	
<i>Subtheme</i>	<i>Supporting Student Statements</i>
Flipped classroom format	“The flipped classroom approach was great! I enjoyed learning being able to pause the lectures to take notes and start watching again or rewatch parts that I had confusion with.”
	“I also enjoyed the flipped classroom lectures, they allowed me to work through the lectures in my own time which helped with my information retention.”
Student group presentations	“The group presentations over the MOPs/FORs really helped me learn about different theories and frameworks that are relevant to OT.”
	“Presenting over the models of practice and frames of reference helped me gain a better understanding of those specific MOP/FOR.”
Theme 2: Deepening Understanding with Active Learning	
<i>Subtheme</i>	<i>Supporting Student Statements</i>
Case studies with discussion	“I learn much better through doing case studies and discussing them in small groups.”
	“The presentations and discussions were beneficial for my better understanding of the content and for overall learning.”
Interactive activities	“I also really like the hands on learning we did in class for each MOP and FOR. It helped solidify the concepts of the theory in my mind.”
	“The activities associated with the theories that we did in class were the most helpful. Lecture does not help me learn well, so having the activities was a nice change of pace.”
	“I found the learning activities after each group's MOP and FOR presentation to be very valuable to my learning. This allowed me to apply the material I was learning and see how the MOPs and FORs assist OT practitioners today.”
	“I enjoyed the creative components to them to help us put our knowledge into an activity. There were some great hands on learning with the activities.”
Theme 3: Application to Real-Life Practice	
<i>Supporting Student Statements</i>	
“I like the idea of learning about the philosophy and theories behind OT. It helped me understand how we shape the way we practice and what makes OT unique.”	
“I also found the real life applications using patients to be helpful in learning.”	
“I also really enjoyed all of the activities that went along with each FOR and MOP because it allowed us to practice what we will be using when we are working as OTs.”	
“I enjoyed directly applying the MOP or FOR following in-class presentations; it definitely is helpful to think back to those activities and applications when studying and thoroughly understanding the MOP or FOR now.”	
“The activities that accompanied each of the presentations also was beneficial because it is nice to see what we will actually be doing during our practice.”	

Theme 4: Perception of Course Design	
<i>Subtheme</i>	<i>Supporting Student Statements</i>
Course structure/layout	“I really enjoyed how this course was set up. I found it helpful to have many different ways to learn the material.”
	“I enjoyed how instead of you teaching the MOPs/FORs, we learned it from our peers which resulted in more interactive/application-based learning.”
Student feelings	“I really enjoyed the interactive parts of the models of practice and frames of reference! They really helped me understand each one better.”
	“This course was organized, structured, and it almost became fun at times. It provided a great environment for learning even when the content was not the most encouraging or exciting.”

Integration of Mixed Methods

Two key concepts were identified from the research questions: effectiveness of course redesign using andragogical and active learning principles for teaching occupational therapy theory and student perceptions of these strategies. Results of the integrated mixed methods analysis are presented in Table 6. When quantitative and qualitative strands were mapped to these main concepts, the data converged. Both sets of data agreed that the course redesign was effective and perceived positively in supporting student learning. Collectively, mixed methods were reflective of overall positive results of this occupational therapy theory course redesign to integrate andragogical, active learning, and learner-centered principles.

Table 6

Convergence Coding of Mixed Methods Analysis

Quantitative Strand	Convergence code	Qualitative Strand
Effectiveness of Course Redesign		
<ul style="list-style-type: none"> • Statistically significant improvements for all course objectives • Course evaluation of targeted qualities in the redesign were significantly improved from the original course • Average student rating of overall course quality improved by 1 point from (3.11 to 4.10) 	Agreement	<ul style="list-style-type: none"> • Robust learning activities supported retention • Variety of activities supported learning, including flipped classroom recordings, group presentations, case studies, discussions, and interactive activities • Application-based activities increased understanding of use of theory in practice

Student Perceptions of Course Redesign		
<ul style="list-style-type: none"> • Average student rating of overall course quality improved by 1 point from (3.11 to 4.10) • Students rated the course and instructors significantly more positively than in the original course 	<p>Agreement</p>	<ul style="list-style-type: none"> • Students preferred a variety of learning activities • Students preferred active learning with application • Students preferred relevance to future practice

Discussion

Accreditation standards for occupational therapy education indicate occupational therapists must be able to choose appropriate theories to guide practice (ACOTE, 2018). Despite this, practitioners continue to struggle to confidently understand and apply theory and utilize it to justify their practice decisions (Ikiugu, 2012; Roberson & Griffiths, 2009; Towns & Ashby, 2014). As had been reported from students in cohorts prior to this course redesign, students tend to feel a disconnect between theory in their didactic learning and real-life occupational therapy practice (Towns & Ashby, 2014). Adult occupational therapy students want to know how educational content directly applies to their future practice in order to enhance their motivation for and excitement about learning (Feldhacker & Greiner, 2022). Confident knowledge and skills are necessary for theoretically-informed professional practice decisions. This research project used a retrospective analysis to determine the effectiveness of a course designed around andragogical, learner-centered, and active learning principles. Results of this study can inform instructors in best practices and student preferences for learning and applying occupational therapy theory to real-life occupational therapy practice.

In the quantitative portion of this study which compared pre/posttest results of course objectives, students in the redesigned course significantly improved their ability to demonstrate knowledge of theoretical concepts related to occupation and behavior; articulate the importance of the philosophical base of occupational therapy, including theory; analyze, synthesize, and apply models and theories of practice; compare and contrast models of practice and frames of reference; analyze and discuss how theory and context influence practice; and discuss theory development and its importance. Students rated this improvement in their learning despite the grade they received in the course. Redesign strategies which utilized active learning and learner-centered principles were effective in meeting course objectives. In addition, results from course and instructor evaluations indicated a significant improvement in many areas for redesigned cohorts over the original pre-redesign cohort. Students in the redesigned course identified that the active learning, andragogical, and learner-centered structure encouraged the application of knowledge and enhanced their learning over a traditional lecture-style course. In the redesigned course, instructors were perceived as significantly more helpful in promoting discussion and facilitating learning, which created

a learning environment conducive for meeting the course objectives. The course was rated as significantly more relevant to occupational therapy practice, improving competence, self-directed learning, understanding, and clinical reasoning when compared to a theory course with a lecture-based structure.

While some content areas naturally lend themselves to active learning, such as those teaching hands-on practice skills, others, including occupational therapy theory or basic science courses, can be more challenging. Entezari and Javdan (2016) reported students in a human anatomy and physiology course strongly preferred active learning activities and indicated that these activities helped them better learn and connect the material to their future careers. In a large study with over 35,000 units of student perception data from 306 courses, Chiu and Cheng (2016) found that students perceived active learning courses as significantly better designed and more encouraging of creativity and innovation when compared to traditional classrooms. Similar to the results of this study, Chiu and Cheng (2016) found that students rated this positive effect irrespective of their academic performance in the course. Also comparable to the results of this study, Thaman and colleagues (2013) found that students showed improved understanding, engagement, and correlation to clinical scenarios using an active learning course design. While utilizing active learning strategies with some content can be more challenging, it is still a more effective strategy in promoting student learning.

In the qualitative portion of this study, which analyzed student comments in the end of course evaluations, themes included learning core concepts, deepening understanding with active learning, application to real-life practice, and perception of course design; the corresponding subthemes related to particularly meaningful components of the redesign. These themes supported student perception regarding effectiveness of the redesign. The revealed themes closely mirrored Kolb's Experiential Learning Cycle (1984; Kolb & Kolb, 2017). Learning core concepts through flipped classroom format related to students' abstract conceptualizing abilities as learners engaged with material in more didactic means such as lectures and readings (Kolb, 1984; Kolb & Kolb, 2017). Small and large group discussion could be considered reflective observation abilities, according to Kolb, due to the reflective nature of the discussions. Active learning with interactive activities and real-life application demonstrated the active experimental abilities of students as there was often a component of role playing, projects, and problem solving involved in these activities (Kolb, 1984; Kolb & Kolb, 2017). The natural connection between the themes and the principles of learning demonstrates the need for adult learners to engage in hands-on, application-based learning to optimize learning outcomes. More importantly, the identified subthemes of flipped classroom format, student group presentations, case studies, discussions, active learning, course format, and student feelings were often described collectively in student comments which shows how use of a variety of classroom activities can impact learning for adult students.

Surprisingly, this study found no significant difference between students' perceived workload in the original lecture-based course and the redesigned course, despite the flipped-classroom structure and peer-directed activities which required increased preparation and time. In fact, student comments identified the flipped classroom and peer teaching as beneficial approaches to learning core concepts. Student positive perceptions of collaborative learning and peer teaching were similar to findings by Pederson (2010) and Howe et al. (2018). Foldnes (2016) and Jensen and colleagues (2017) found that flipped classroom strategies did not improve student satisfaction or student performance over traditional lecture-based classes. Instead, they each concluded that learning gains resulted from active learning instruction rather than the flipped approach alone. Though students in this study perceived the flipped classroom as beneficial, instructors of occupational therapy theory content should consider that improvements reflected in the results of this study may be from the active learning components rather than the flipped classroom content. Additionally, a small study by Zachry et al. (2017) found that occupational therapy students preferred traditional lectures over team-based learning, which they hypothesized could be due to comfort. Flipped-classroom techniques can help to bridge this gap in student comfort for effective learning of practical and hands-on skills of theoretical concepts.

Within the context of occupational therapy, these study results complement existing literature which describes the difficulty students and new practitioners experience when applying theory (Ikiugu, 2012; Robertson & Griffiths, 2009; Towns & Ashby, 2014). While student feedback prior to this course redesign was only indirectly reported as the reason for the course modification, this feedback of difficulty understanding and applying theory is consistent with findings from previous literature. In the larger context of teaching and learning literature, study results supported principles of andragogy, learner-centered teaching, and active learning. Student feedback reinforced the role of the instructor as discussion facilitator to assist students in connecting prior experiences to new concepts (Beausaert et al., 2013; Gilboy et al., 2015; Hmelo-Silver, 2004; Merriam & Bierema, 2014). Additionally, the focus on application throughout the course strengthened the andragogical principle of real-life application noted by Merriam and Bierema (2014), as students frequently reported the benefit of seeing the explicit and realistic connection of how theory guides practice through case studies and many other activities.

Limitations

A variety of limitations can be noted for this study, most related to the retrospective nature of the design. While we were able to compare course and instructor evaluations to the original cohort prior to the redesign, there was no true control group. Additionally, the outcome measures used were not intended for research purposes and thus lacked validity and reliability. The pre/posttest questions were written related to ACOTE (2018) standards to assess achievement of intended learning objectives but could have been modified to collect data related to specific principles of the redesign and aspects of theory understanding and confidence in application. Also, students responded to these measures because they were providing feedback for the course rather than as part of a research study, which could be viewed as a strength or limitation. Study findings were

based upon students' perceptions of their own learning rather than objective measures of these outcomes. Related to this, students' high ratings of the course could be linked to their enjoyment of the activities, as we tend to think more positively about activities that are enjoyable. Additionally, the guiding theories of the redesign, such as andragogy and active learning, were not evaluated specifically. Rather, conclusions were drawn based on extrapolation from existing literature and theoretical concepts about learning. Lastly, while our sample was representative of the gender spread for the profession of occupational therapy, there is limited ability to generalize results based on gender beyond our profession.

Implications for Occupational Therapy Education

Instructors should consider structuring theory coursework around andragogical, learner-centered, and active learning principles to improve student engagement and interaction with theoretical concepts. Results of this study can inform instructors in best practices and student preferences when instructing theory-related coursework and how to create learning opportunities which have distinct value in creating occupational therapy practitioners who are confident in utilizing theory to inform practice decisions.

In the future, researchers should expand on and strengthen these results by completing similar course redesigns using andragogical and active learning principles while also including data from the original course design (excluding these principles) to intentionally serve as a control. Study measures should utilize tools with established psychometric properties, and objectives should be written based on guiding theories for the redesign. Investigators should consider longitudinal studies linking didactic coursework to fieldwork and practice as well as collection of data from stakeholders such as clinicians or fieldwork educators to support student self-report and perception with actual use and skill.

Conclusion

In conclusion, adult, graduate-level occupational therapy students need active learning experiences to bridge the gap between theory in the classroom and theory in real-life application to inform and guide practice. This study found that using learner-centered, active learning principles to educate occupational therapy students about theory was effective in bridging this gap. Implementing this type of course redesign can improve occupational therapy students' ability to engage in theory-driven practice in the future, powerfully influencing the profession.

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