

**Development and Effectiveness of a National Board Certification for Occupational Therapists (NBCOT)
Examination Preparatory Course**

**Aurelia Alexander, OTD, OTR/L
Florida A&M University
Tallahassee, FL**

**Martha Perryman, Ph.D., MBA
Florida A&M University
Tallahassee, FL**

**Patrick A. Rivers, Ph.D., MBA
Southern Illinois University
Carbondale, IL**

ABSTRACT

This study examined the effectiveness of the use of a test preparatory course to increase the first time passage rate on the National Board Certification for Occupational Therapist (NBCOT) examination. Means of the pre- and post-Occupational Therapy Knowledge Exam (OTKE) scores, as well as the change between pre- and post-intervention were calculated. The pre-OTKE mean score was 50.85, in comparison to, the post-OTKE mean score of 56.00 with a mean change in OTKE score of 5.15. The study results support the use of a mock examination in conjunction with other test preparatory techniques. Results of this study can serve as a baseline for the structured use of educational techniques to measure student improvement on first time passage rates for the NBCOT examination.

Keywords: Test preparatory course, Occupational Therapy, pass rates, Allied Health, first time passage rate.

For over 100 years, Occupational therapists (OTs) have provided health care services which foster increased well-being and full engagement in the daily lives of their clients. The educational process for OT students includes didactic coursework, practical experience, and the licensure examination. OT students must pass the NBCOT examination in order to be deemed qualified and competent to work as an OT (AOTA, 2009; NBCOT, 2005). The impetus for this project is the decline in first attempt passage rates for OT students at Florida Agricultural and Mechanical University (FAMU). In 1991, thirteen students completing the OT program at FAMU passed the NBCOT examination with 100% success on the first attempt. However, in 2011, only 33% of students (5/15) passed the exam on the first attempt. (See Table 1) One solution to combat this decline in first time passage rate is to develop and implement a test preparation course (TPC) which should result in a first attempt NBCOT examination passage rate of at least 70% (AOTA, 2005; AOTA, 2006).

Table 1

First Time Pass Rate of the Master Level Occupational Therapy Program (FAMU)

MSOT Students	2007^a	2008	2009	2010	2011
Enrollment	1	4	9	14	15
Graduates	1	4	9	14	15
First Time Pass	0	2	1	1	5 ^b

Note. ^a First year of master's level occupational therapy program at FAMU.

^b Thirteen of the total 15 students have taken the examination at this time.

A TPC is designed to provide a means for measuring improvement in student study skills and test-taking success. The outcomes of a TPC also include assisting the student to identify and adopt successful test taking tools and techniques and to allow the program faculty to monitor student learning outcomes (Zimmerman et al, 1992; Vasan et al, 2008). Other components of a successful TPC include acknowledgement of stereotypical threat, reducing test anxiety, and identifying successful learning and test taking strategies (Zimmerman et al, 1992; Townsend & Wilcox, 2004; Vasan et al, 2008).

Occupational justice and stereotypical threat

This course permitted participants to engage in understanding the NBCOT. Course participation provided students with the information required to become familiar with the structure of the NBCOT as well as types of questions on the examination to meet each student's needs in reaching an appropriate competency level. Research findings indicate that test participants who possess a feeling of constructive support and positive feelings regarding their skills attainment and intellectual performance will also have increased emotional support which negates stereotypical threat (Hancock, 2001; Steele, 1997; Trueba, 1988). The opportunity for students to engage in study skills and test preparation is necessary to achieve the projected passage rate outcome.

Test anxiety

Researchers have found that identification and remediation of test anxiety will assist participants with successful test passage performance. Reduction of test anxiety also contributes to a positive learning atmosphere (Brown et al., 2011). Cognitive behavior techniques such as deep breathing exercises and guided imagery have also had a positive impact on test taking experiences (Hembree, 1988).

Approach to learning and test taking strategies

The TPC will offer students real-time experience with question type, application of critical thinking skills, test timing, and use of visual or auditory repetition which results in the adoption of successful test taking strategies (Avi-Itzhak & Krauss, 2010; Crockford et al., 2004; Dadian et al., 2002; Schunk, 2008). This Institutional Review Board (IRB) approved study examined the effectiveness of a TPC on increasing the first time passage rate on the NBCOT examination. This course consisted of pre- and post-test administration of the Occupational Therapy Knowledge Examination (OTKE). The first cohort was composed of students enrolled in the OT program at the end of the Summer 2012 semester. Participants were provided with an online introduction letter and consent form via the Blackboard course site. The Conner Ageless Learning Style Inventory (CALSI) and the Learning and Study Strategies Inventory (LASSI) were given to participants to increase students' awareness of their ability in the areas of learning style and study strategies related to skill, will, and self-regulation. Upon completion of these assessments, participants were given their areas of strengths and weaknesses to augment their individual study program.

METHODOLOGY

Upon completion of the CALSI and LASSI, the OTKE was administered to provide information regarding the baseline knowledge of participants in the OT process and domain areas. Individual usernames and passwords were given to participants to assure privacy and confidentiality. Upon completion of the initial OTKE, relative strengths and weaknesses were issued to each participant in order to augment individual study programs. Following completion of the CALSI, LASSI and OTKE assessment tools, educational sessions were created for use in assisting with development of study skills. The third and sixth editions of the *National Occupational Therapy Certification Exam Review and Study Guide* and *Preparing for the Occupational Therapy National Exam: 45 Days and Counting* were the textbooks used for this study (Fleming-Castaldy, 2012; Cottrell, 2009; Dizazzo-Miller & Pellerito, 2009). Additional information on time management and examination preparation techniques was offered in weekly educational sessions via PowerPoint presentations on the Blackboard course site (Baum & Law, 2007).

Each presentation included questions that assessed the consistence of session completion. Supplemental assignments were included in the TPC course to assist students with the application of information to learn successful self-study skills. The use of the Blackboard Learning System allowed participants to answer questions and complete handouts at their own pace. During this stage of the project, the following six weekly instructional modules were developed: time management, test preparation, study tips, effective examination process, intervention, and stress /calming aspects and techniques.

Each participant completed handouts to document their concerns about barriers to adoption of effective time management skills. In addition, the participants' discussion notes were utilized to assess whether the modules were useful to participants in studying and preparing for the mock examination. Discussion notes were also used to individualize the study skills of the participants and allow them to identify areas of concern. Each participant completed a form that recorded the duration and content of study sessions, as a means of documenting the most and least helpful elements of the session. Study sessions began during the second week of school, while participants were initiating, in the middle of, or had completed, Level II fieldwork. The schedule had to be adjusted twice in order to accommodate Blackboard system malfunctioning and the variable schedules of the participants with respect to Level II fieldwork opportunities.

The goals of these sessions were to assist each participant in becoming as comfortable as possible with completing screening assessments, while gaining insight on areas of needed assistance. A description of each participant's learning style is shown in Table 2.

Table 2
Conner Ageless Learning Style Inventory Results for the Master Level of Occupational Therapy Program (FAMU)

Participant	1	2	3	4	5	6	7
Learning Style							
Visual		X		X	X	X	X
Auditory		X	X	X	X	X	
Tactile/Kinesthetic	X		X		X		X

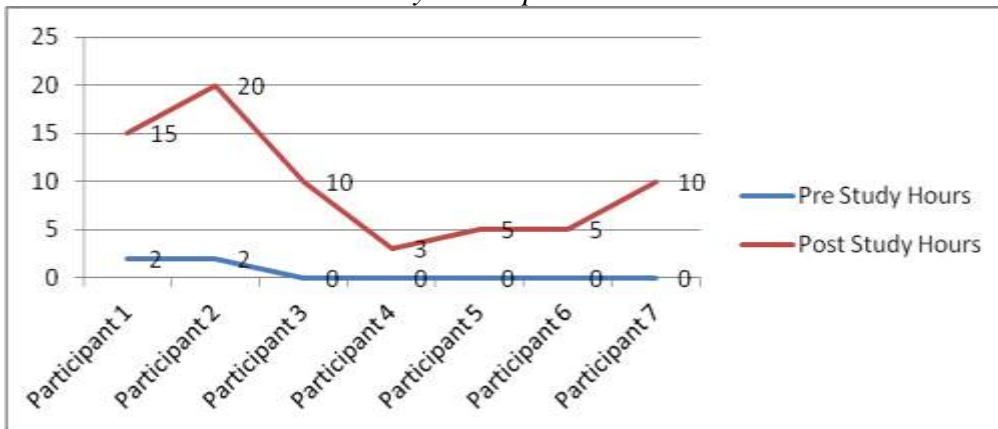
Note: X denotes the areas of learning styles for the individual participants

Subsequent sessions via discussion board, which were completed at least once per week, consisted of presentations that included questions aimed at focusing participants' learning. Participants were required to check in via Blackboard discussion threads two to three times a week. The second through fifth sessions included information on how to take the NBCOT exam as well as tips and ways to provide encouragement to continue to develop their time management skills while completing study activities.

Specific information was given on how to identify barriers to effective time management and how to set goals to address the specific problem areas. Additionally, participants were provided with information on development of an action plan to formulate smart goals and decrease time wasting activities. After six weeks, participants' study schedules were examined. Table 3 shows pre- and post- intervention study hours per week for each participant. For example, participant 1's pre-and post-intervention study hours per week were two and 15 hours, respectively. These results indicate that study hours for this participant increased by 13 hours per week. The results also indicate that the largest increase in study hours was 18 for participant # 2 and the smallest change was 3 hours for participant # 4. The mean change in weekly study hours was 9.14 for the study participants.

Table 3

Pre- and Post-Intervention Study Hours per Week



Participants completed the post-test OTKE by the sixth and seventh week. At the conclusion of the seventh week, each participant's data were summarized and analyzed with descriptive statistics. Results included participants' OTKE scores at the beginning and end of the six weeks, the difference between pre- and post-OTKE scores and information about what either worked best or could be improved.

RESULTS

Seven students from the FAMU School of Allied Health Sciences OT program participated in this project. Six students had received Bachelor of Science degrees in health science with a concentration in occupation and wellness from FAMU. . Two participants were parents and six participants were single. Two participants worked while completing Level II fieldwork. Five participants were completing second Level II fieldwork, while two participants had completed both Level II fieldwork experiences. The majority of participants were from Florida; one student was from Georgia. Five participants were African American and two were Caucasian. Five participants were originally from urban settings (i.e., Atlanta, Miami, Orlando, and Tampa), one was from a small rural area of Florida, and one was from a medium size city. Participants ranged in age from 25 to 33 years and all planned to work as OTs after graduation. Three students expressed interest in working with the pediatric population, two preferred the geriatric population and two remained undecided about their population of interest.

Participants completed a self-reported learning style rating tool to direct educational sessions to appropriate areas of concern. Results were scored manually per LASSI manual instructions and individual reports were given to each participant. These analyses demonstrated a wide range of individual areas of concern for the ten assessed areas. Table 4 shows information regarding areas of relative weakness via LASSI. Pre- and post-OTKE scores are shown in Table 5.

Table 4

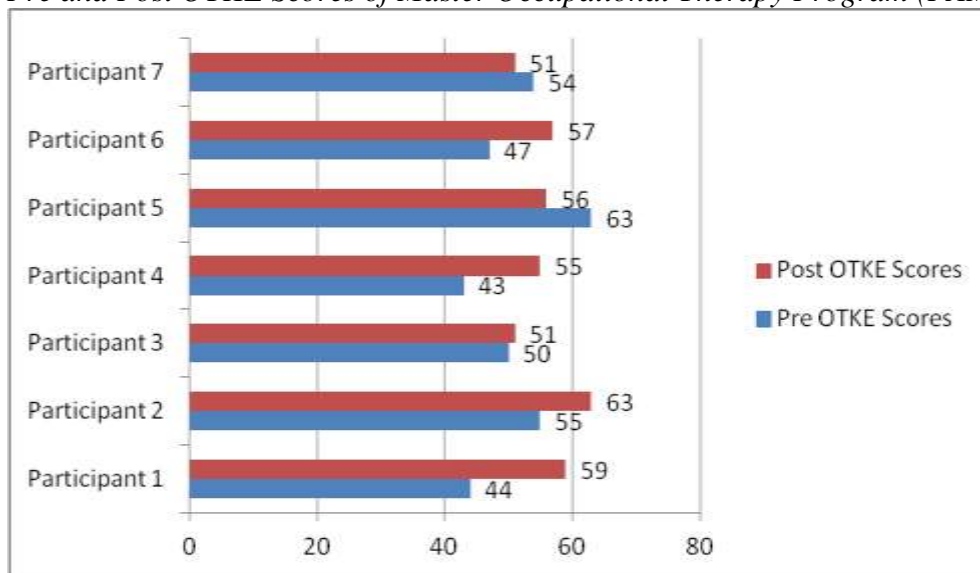
Learning and Study Skills Inventory Results for the Master Level of Occupational Therapy Program (FAMU)

Participant	1	2	3	4	5	6	7
Scale Area							
Information Processing							
Selecting Main Ideas							X
Test Strategies		X					X
Anxiety							X
Attitude	X		X			X	
Motivation							
Concentration							X
Self-Testing							
Study Aids	X			X	X		
Time Management							

Note: X denotes the areas of weakness for the individual participants

Table 5

Pre and Post OTKE Scores of Master Occupational Therapy Program (FAMU)



Note: Pre-OTKE taken August 2012 and Post-OTKE taken October 2012. Score is out of a total of 100.

Descriptive statistics were used to determine the effectiveness of addition of the test preparation course to the curriculum. Means of the pre- and post-OTKE scores, as well as the change between pre- and post- intervention were calculated. This pre-OTKE mean score was 50.85 and the post-OTKE mean score was 56.00, with a mean change in OTKE score of 5.15. It is important to note that some participants stated that taking the OTKE during their fieldwork practical experience was not an optimal time as they were mentally tired and did not take the mock examination seriously. Nonetheless, five participants demonstrated a higher score at the post-test attempt.

LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Limitations of this project included the lack of technical support for the Blackboard Learning System as well as a lack of wireless locations with Internet accessibility for participants to submit course assignments in a timely manner. The information bias, and research methodology issues were also limiting factors. For example, participants who were self-motivators used the information provided plus supplemental study information, thus skewing the results. Another limitation was the premise that study participants would want to begin studying for the NBCOT examination nearly a year in advance.

Scheduling this intervention project in September during level II fieldwork negatively impacted participants, as they were often pressed for extra time to study which resulted in an increase in last minute test preparation. The short duration of the intervention project (i.e., six weeks) and the large volume of course content may have limited participants' ability to implement needed study habits, test taking tasks, and relaxation skills in a structured format to improve scores on the mock registration examination. Furthermore, the short intervention time meant that a comprehensive view of factors that impacted score improvement on the OTKE examination was not possible.

The relationship of the project coordinator and the participants proved to be a limitation. For example, because the coordinator had previously worked with participants while they were undergraduates, more was expected from participants, thus skewing the results of the evidenced based project. Furthermore, participants may have been less than truthful during self-report aspects of the study, in hopes of either pleasing the coordinator or falsely enhancing the project.

DISCUSSION

In addition to the scores of the OTKE and LASSI, and the use of educational sessions and handouts, participants provided information in the form of discussion forums. These forums included discussions of test preparation techniques and information sharing which included participants' feelings about initiating and participating in course study tasks. Specific comments are reported in Addendum 1. This information provided insight to needed course revisions in order to improve behaviors and feelings, thereby promoting study engagement and test preparatory tasks. This information also offered directions to faculty with regard to designing a program that fosters active learning activities and increased first time passage rates of the NBCOT examination.

Test anxiety, stereotypical threat, and lack of occupational justice were factors of concern for this evidenced-based project. Participants' comments focused on time management issues, changes in curriculum (e.g., timing of courses in conjunction with level I and II fieldwork experiences), and value of course information. Participants pondered the value of studying for a test that would not be taken for at least three to four months after the conclusion of this course. There were also concerns about the futility of using tools to assess knowledge of study habits and styles already possessed by participants.

Students were more interested in use of test taking strategies and resources during perceived appropriate times to study for the NBCOT examination as indicated by interest in learning about strategies and the request for individual meetings.

Some participants believed that use of only one test type was not beneficial to test preparation, but that they did appreciate that the OTKE provided insight to the types of questions included in the NBCOT examination as well as the importance of exam endurance. Completion of the OTKE also provided each participant with strengths and weaknesses. Each participant believed in the importance of positive mental and emotional environments for learning.

The effects of a test preparatory course on student performance on a mock registration examination are inconclusive. Quantitatively, a majority of participants did demonstrate increased post-test scores. Qualitatively, it is uncertain if the type of student taking the test affected scores on the mock examination, if increased test scores were due to the change in preparation for the national exam or if increased mock test scores were due to attention to improving test preparation skills. Participants demonstrated increased post-OTKE scores. Thus, this course provided a tangible means for building successful tools to monitor student progress.

CONCLUSION

This implementation study is important to provide a channel for FAMU students to become skilled, culturally sensitive, and diverse practitioners in the OT field. Furthermore, using an organized and efficient format of instruction to assist students on the NBCOT examination can result in sharing of this information with other OT educational programs which allows for a means of continuous revision and necessary improvement. It is essential that OT recipients believe in the skill and proficiency of the therapist. Use of this university-created course could provide an acceptable method to establish best practices of instruction. Moreover, this course would allow for continuous and timely modifications to assist students during examination attempts. Such an approach has the potential to allow for a mechanism to contribute not only to FAMU's research in the area of examination issues with student learning and best methodology in test taking skills but also to increase knowledge in social, cultural, and environmental aspects of student learning and long term retention.

This study offered a basis for an expansion of a test preparatory course for all FAMU students enrolled in the OT program. Use of the course provided an opportunity for participants to become familiar with the computerized format of the NBCOT examination, a chance to improve test taking skills, and the opportunity to practice critical thinking skills. The expansion of this course would include the following opportunities for adaptation to fit the needs of students as they progress through the FAMU Occupational Therapy program: Identification of content knowledge in which students are consistently strong; Continue courses that promote appropriate course mapping to meet ACOTE standards; Identification of content knowledge in which students are consistently deficient to revise course assignments to meet the needs of students and ACOTE standards; Identification and creation of additional mock examinations for assessment of student ability via use of clinical simulations versus multiple choice question format; Establishment of an examination bank to provide regular testing opportunities for students to assist with familiarity of the examination and decreased test anxiety; Submission of grant applications and program proposals for additional funds for student access to practice tests needed in individual programs of study; and coordination and cooperation with additional health care programs at FAMU (i.e., Physical Therapy, Nursing, Public Health, and Pharmacy) for consistent success in examination passage rates.

The results of this research provides information regarding the correlation between student attitude to standardized test taking experiences and the mapping of health care curriculums to substantiate positive student behaviors across several educational programs. This study also addresses the changing national demographics in that the results support further development of program courses tailored to students attending a HBCU or a minority student attending a majority university. Finally, expansion of this project would allow for evaluation of student passage rates for OT programs nationwide, as well as overall promotion of the ACOTE standards for educational programs.

This occupation-based approach is a prime example of the OT process in action. Use of the client-centered Person-Environment-Occupation-Performance (PEOP) model and the *Occupational Therapy Practice Framework II* (AOTA, 2008) allows future therapists and educators to contribute to the cultivation of competent entry level therapists. This intervention, if applied correctly, will increase the likelihood of first time passage for the NBCOT examination by encouraging the adoption of successful test taking strategies.

ADDENDUM 1

Sample Comments from the Participants

These activities produced the following comments:

“It is too early to start studying for the exam.”

“The LASSI just reinforced things that I know about myself and perhaps things that need fine tuning.”

“The method of studying by increments allows for more information to transition into long term memory...but no one way to study but many factors that will contribute to our success.”

“I also discovered that writing out information and grouping things in charts was very helpful for me.”

“I was comfortable taking it (first OTKE)...however I was getting a little tired.”

“I do not need to sign up for this course.”

“I will not have time to complete course activities and perform for my fieldwork.”

“I thought the OTKE was not hard, but there were questions about interventions I had never heard of...I was not taught in the classroom.”

“Perfectionism can potentially develop a significant amount of stress and worry and it could ultimately negatively impact my overall health and well-being.”

“Over scheduling is a time waster...as a grad student, a mother, and working a job limits my time.”

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Aurelia Alexander, OTD, OTR/L, is assistant professor of Division of Occupational Therapy in the School of Allied Health Sciences at Florida Agricultural and Mechanical University in Tallahassee, Florida. Dr. Alexander was the lead instructor for the development of the test preparatory course. Dr. Alexander can be reached at e-mail: aurelia.alexander@famou.edu and phone: 850-561-2018

Martha Perryman, Ph.D., MBA, is associate professor in the division of Health Care Management in the School of Allied Health Sciences at Florida Agricultural and Mechanical University in Tallahassee, Florida. Dr. Perryman can be reached at e-mail: martha.perryman@famou.edu and phone: 850-561-2009.

Patrick A. Rivers, Ph.D., MBA is professor in the division of Health Care Management in the College of Applied Sciences and Arts at Southern Illinois University in Carbondale, Illinois. Dr. Rivers can be reached at e-mail: privers@siu.edu and phone: 618-453-8842