DEVELOPMENT OF A MAPPING TOOL FOR ANATOMY-RELATED CONTENT IN ENTRY-LEVEL OCCUPATIONAL THERAPY PROGRAMS

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Development of a Mapping Tool for Anatomy-related Content in Entry-Level Occupational Therapy Programs

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Abstract

Occupational therapy (OT) practitioners utilize anatomy and anatomy-related knowledge to analyze occupational performance and design intervention plans for prevention, rehabilitation, and wellness. The Accreditation Council for Occupational Therapy Education (ACOTE) provides standards and guidelines about anatomy-related knowledge, but faculty must interpret these standards to design curricula to meet them. The process of curriculum mapping requires that OT educators identify and assess the anatomy and anatomy-related content present in entry-level programs. In this study, the primary researcher developed a tool as a first step to assist faculty in identifying the amount and scope of anatomy-related content taught in entry-level programs. Official documents of the American Occupational Therapy Association (AOTA) and curriculum mapping studies were used as guidelines for developing the tool. Five expert consultants, who each have a minimum of three years' experience teaching in an entry-level occupational therapy program, completed three surveys to validate the tool. The usability of the tool was assessed by applying it to an entry-level Master of Science in OT (MSOT) program.

Keywords: Bloom's Taxonomy, curriculum design, educational methods, tool development

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Background

Occupational therapy (OT) practitioners facilitate engagement in meaningful occupations through analysis of occupational performance. Such analysis forms the basis for all OT models of practice (AOTA, 2010; Christiansen & Baum, 1997). To facilitate participation in occupations, OT practitioners need to understand how activity demands (extrinsic factors) and client performance skills (intrinsic factors) enable or hinder participation in occupation (AOTA, 2010; AOTA, 2014). OT educators must ensure that graduates of accredited programs develop the skills necessary to evaluate these intrinsic and extrinsic factors (AOTA, 2010). Evaluating intrinsic factors requires a deep understanding of body structures and body functions (World Health Organization, 2003). To understand body structures and to analyze factors related to occupational performance, OT students need to be instructed in anatomy (Carroll & Lawson, 2014). The Accreditation Council for Occupational Therapy Education (ACOTE) sets the standards for all OT graduate programs in the United States and identifies one standard naming anatomy (ACOTE, 2013). ACOTE names anatomy in the B.1.1 standard:

> The student will be able to demonstrate knowledge and understanding of the structure and function of the human body to include the biological and physical sciences. Course content must include, but is not limited to, biology, anatomy, physiology, neuroscience, and kinesiology or biomechanics (ACOTE, 2013, p. s33).

There are also ACOTE standards linked to the assessment of intrinsic client factors which require knowledge of anatomy. ACOTE specifies in the B.4.4 standard that OT students be able

to evaluate person-centered factors and performance skills (ACOTE, 2013). ACOTE provides the outline identifying the content required of graduates of accredited programs, but faculty have the responsibility to develop the curriculum to fulfill these requirements (ACOTE, 2013).

Faculty can use the Blueprint for Entry-Level Education (Blueprint) (AOTA, 2010) as a guide for curriculum development when designing OT programs (AOTA, 2010). A panel of expert OT faculty developed the Blueprint to identify the knowledge needed for OT practitioners to understand what clients require to perform meaningful occupations (AOTA, 2010).

The Blueprint is based upon the three concepts of occupation, person, and environment (AOTA, 2010). The person-centered factors in the Blueprint related to anatomy content include physiological support, sensory/perceptual support, and motor support. The intrinsic factors identified as “person-centered” are linked to "skills that should be developed to be able to implement the concepts and the areas of practice that require this knowledge” (AOTA, 2010, p. 187). Table 1 outlines the components from the Blueprint which make up the person-centered factors. These skills include assessment, intervention planning, and activity analysis (AOTA, 2010). In the Blueprint, eight key sciences are listed as required to provide students the skills needed to treat the person-centered factors in OT: anatomy, neuroscience, physiology, occupational science, rehabilitation science, exercise science, and anatomy and physiology (AOTA, 2010). Researchers report that knowledge of anatomy is important for students in OT, physical therapy, and medicine (Sbayeh et al., 2016; Thomas, Denham, & Dinolfo, 2011).

Through the use of curriculum mapping, OT educators can identify elements of a curriculum and ensure that content is presented with increasing complexity (Krathwohl, 2002; MacNeil & Hand, 2014). This allows faculty to provide course structure whereby simple concepts are mastered as prerequisites to complex knowledge so that students can develop

competency and confidence in their learning. Faculty scaffold material to increase the complexity and promote student success (Krathwohl, 2002). Educators may use the hierarchy provided by Bloom's Taxonomy as a guide for scaffolding knowledge and as a way to align educational objectives, activities, and assessments (Krathwohl, 2002).

Problem Statement

OT educators are required by ACOTE to design curricula to meet the accreditation standards (ACOTE, 2013). Through curriculum mapping OT educators can identify gaps and repetitions in content and assess if adequate content is present in OT programs (MacNeil & Hand, 2014). There is currently no tool available for OT faculty to assess where and how anatomy and anatomy-related content is being taught in entry-level programs. A tool to map anatomy and anatomy-related content provides a first step in this process (Litaker et al., 2004).

Purpose Statement

The purpose of this study was to establish a tool with face and content validity to map anatomy-related content in OT programs. The usability of the tool was assessed by mapping the anatomy-related content in one MSOT program.

Research questions. In this study, the primary researcher answered the following research questions:

1. Can a tool with both face and content validity be established to map anatomy-related content in OT programs that meet ACOTE standards?
2. What is the usability of the mapping tool for faculty designing and evaluating OT programs?
3. How is anatomy-related content integrated into one MSOT program?

Significance of the Study

OT faculty can use the developed tool to identify the anatomy-related content they use to meet the ACOTE standards regarding basic sciences and assessment of person-centered factors (Schofield, 2014; Sellar et al., 2017). It can be used to tie course objectives to student learning outcomes and provide a method to demonstrate the scaffolding of content. It can also provide a structure for faculty to examine a curriculum while reviewing it for re-accreditation or program assessment.

Background and Significance

OT practitioners facilitate participation in meaningful occupation through the analysis of occupational performance (AOTA, 2014). Knowledge of anatomy is needed for them to understand client factors such as body structures and body functions (AOTA, 2014; Carroll & Lawson, 2014). In recent studies, researchers have examined the importance of anatomy education in medical and allied health programs, the teaching methods used in those programs, and trends in anatomical education (Carroll & Lawson, 2014; Guzman et al., 2015; Thomas et al., 2011).

Importance of Anatomy Education in Health Profession Programs

Anatomy and anatomy-related content are integral to the training of OT practitioners and medical students (Carroll & Lawson, 2014; Sbayeh et al., 2016; Schofield, 2014). Schofield (2014) examined the perceptions of OT practitioners regarding the importance of anatomy education. The participants were OT practitioners from Arizona who practiced in outpatient, acute, and pediatric settings and who supervised entry-level OT students. All respondents (n =107) reported that OT students needed anatomy knowledge and that an undergraduate anatomy course was not sufficient to provide it. Eighty-three percent of respondents reported using anatomical knowledge consistently to analyze activities. All respondents reported that

knowledge of the musculoskeletal and nervous system is essential to OT practice, especially in upper limb rehabilitation (Schofield, 2014).

Sbayeh et al. (2016) completed a cross-sectional, questionnaire-based study for medical students, recently graduated doctors, and anatomy educators in Great Britain and Ireland to determine the clinical relevance of anatomy to medical practice. They utilized a Likert scale to measure ratings and found that educating medical practitioners requires an anatomy curriculum that fulfills the needs of developing clinicians (Sbayeh et al., 2016). The anatomy educators reported that more time should be devoted to anatomy education (Sbayeh et al., 2016).

Guzman et al. (2015) completed a qualitative study of 363 students at two medical schools in California. They conducted three annual online surveys in which the students provided qualitative responses. The researchers coded the responses as positive if the students perceived anatomy to be beneficial to them in preparing for board exams, third-year clerkships, and clinical evaluation skills (Guzman et al., 2015). Ninety-nine percent of the students reported that anatomy was a highly valued part of their medical school education. Eighty-nine percent of students reported that anatomy helped them prepare for board exams; 95% reported that it helped them prepare for third year clerkships; 65% reported that it prepared them to perform clinical exams (Guzman et al., 2015).

Moxham and Plaisant (2007) completed a pre-test and post-test survey of medical students to explore their opinion of the importance of anatomy to clinical medicine. The researchers surveyed 350 medical students before they began studying anatomy, after the course was complete, and in the final year of medical school. In all surveys, all students reported that the practice of medicine could not exist without knowledge of anatomy and that doctors would not be effective without such knowledge (Moxham & Plaisant, 2007).

Recognizing the need to make anatomy content clinically relevant, educators of future medical doctors sought to discern the level of anatomy education needed to develop competent practitioners (Fitzgerald, White, Tang, Maxwell-Armstrong, & James, 2008). Fitzgerald et al. (2008) conducted a cross-sectional survey study to seek the opinions of newly qualified doctors about the anatomy content received in medical school. One group of students completed an undergraduate level anatomy class only, and one group completed a graduate level anatomy class. The authors asked the students whether they received adequate anatomy education. Eighty percent of those who completed the graduate course answered yes and 46% of those who completed the undergraduate course answered yes (Fitzgerald et al., 2008). These results indicate that medical students perceive that advanced anatomy education is important to be included in their medical training (Fitzgerald et al., 2008).

Effective Educational Methods of Anatomy Instruction in Curriculum Design

Researchers illustrated the necessity of anatomy education for doctors and OT practitioners (Carroll & Lawson, 2014; Sbayeh et al., 2016). Although knowledge of anatomy is recognized as essential, effective delivery of such knowledge is threatened by several factors: time constraint, cost and availability of cadavers, and lack of qualified instructors (Thomas et al., 2011). The perceptions of students and teachers regarding these methods of instruction were examined to assess the efficacy of them (Agnihotri & Kalyan, 2013).

Gabard, Lowe, and Chang (2012) completed a descriptive study to investigate current and future practices related to anatomy instruction in medical and physical therapy schools. They designed a survey, utilizing the Delphi method, to gather expert faculty testimony on current and future practices of anatomy education. They found that although educators reported that cadaver dissection is the most effective method to teach anatomy, it is costly, has limited availability,

does not allow students to be exposed to technological advances in medicine, and may have adverse health effects (Gabard et al., 2012). All respondents (n = 75) agreed that the type of anatomy instruction used was influenced by budget, time, and availability of qualified instructors. In the future, researchers should study the efficacy of newer educational methods in relationship to clinical competencies would be warranted (Gabard et al., 2012).

Thomas et al. (2011) examined the perceptions and preferred educational methods of physical and occupational therapy students in a gross anatomy course, to assess the efficacy of methods such as computer-assisted and small group learning. The researchers surveyed 106 first-year students enrolled in a gross anatomy class. The traditional lecture and dissection lessons were supplemented with interactive discussions, led by teaching assistants, and online anatomy independent study modules. All students reported that they gained more knowledge from the discussions and multimedia approaches to learning than from lectures. The findings of these researchers support the use of non-traditional, multi-modal, and interactive educational methods of anatomy instruction.

Agnihotri and Kalyan (2013) completed a qualitative pilot study surveying 150 anatomy instructors at physiotherapy schools in India, comparing a multimedia instructional approach to problem-based learning. Instructors employed a multimedia approach utilizing computer-based audio-visual resources which students could access from home or in class. They also used problem-based learning, which allowed students to apply anatomy while exploring the diagnoses of actual or simulated patients. All respondents (n = 150) agreed that both approaches were relevant for learning anatomy; they overwhelmingly preferred a combination of traditional lecture, multimedia, and problem-based learning (Agnihotri & Kalyan, 2013). Multi-modal teaching of anatomy content resulted in more active learning, which strengthened the

relationship between student knowledge and mastery of clinical skills (Agnihotri & Kalyan, 2013).

Ogard (2014) completed a descriptive study in a doctor of physical therapy program in Alabama. The researcher compared the efficacy of a newly implemented anatomy curriculum, which reduced the hours of cadaver dissection, to the one used the previous year. In the new curriculum, the students participated in two 3-hour cadaver labs augmented with video dissection, lectures, and active learning. The students in the previous curriculum participated in bi-weekly 150 to 180 minute dissection sessions only. The author compared the two curricula, using student perceptions and exam grades as criteria for evaluation. The students perceived that dissection was the most valuable aspect of the course but there were no significant differences in exam scores. The researcher concluded that methods other than cadaver dissection led to successful student outcomes in anatomy (Ogard, 2014).

Application to Anatomy Curricula in OT Education

Otegui (2017) believed that reducing anatomy to its most simplistic form, by encouraging students to memorize long lists and charts, harms the discipline and limits its ability to answer deeper questions about the structure and function of humans. To understand and apply anatomy requires an analytical approach which will reassemble the component parts into a whole (Otegui, 2017). Applying methods of curriculum mapping to anatomy content in OT education provides faculty with empirical data regarding how students learn and can inform future curriculum designers (Carroll & Lawson, 2014; MacNeil & Hand, 2014).

Mapping has allowed faculty to examine curricula to assess the content covered and to avoid gaps and redundancies (Willett, 2008). Faculty from medical schools, pharmacy schools, schools of social work, and OT programs completed curriculum mapping projects to ensure that

students received sufficient content to become prepared clinicians (Al-Eyd et al., 2018; Merritt, Blake, McIntyre, & Packer, 2012; Oyewumi, Isaac, Schreiber, & Campisi, 2012; Plaza, Reierson, Slack, Skrepnek, & Sauer, 2007; Sellar et al., 2017; Watts & Hodgson, 2015; Willett, 2008).

Willett (2008) surveyed Canadian medical school faculty to describe their efforts to map a curriculum, the challenges they encountered, and the successes they achieved through the process. At the time of the study, 74% of undergraduate medical schools were in the process of building curriculum maps or had already completed them (Willett, 2008). Study respondents reported that the time involved in mapping a curriculum and their lack of experience with the process posed the biggest challenges to them. Despite challenges, faculty reported that mapping the program helped them concentrate on the curriculum (Willett, 2008).

Al-Eyd et al. (2018) completed a centralized curriculum mapping process at a new medical school. They developed a tool to link course objectives to program learning outcomes. This map was used to develop, modify, and evaluate the curriculum to maintain integrated content between courses and across semesters. The researchers found that the tool was useful in identifying the areas in which content and learning outcomes were addressed (Al-Eyd et al., 2018).

Faculty at the University of Toronto mapped the undergraduate medical school curriculum to determine if the accreditation standards related to otolaryngology were being fulfilled and if any gaps or redundancies existed in it (Oyewumi et al., 2012). This mapping allowed them to evaluate if students received adequate instruction to develop clinical skills. The faculty identified the topics and skills related to otolaryngology and the courses in which they were taught. The researchers mapped the dedicated teaching time for each topic. They classified

each type of teaching as type I (highly weighted and focused on lecture or seminar), type II (content presented but not the main focus), and type III (content minimally referenced) (Oyewumi et al., 2012). The findings of these researchers led the faculty to establish a systematic way of teaching the content, a system which improved faculty and student satisfaction, and highlighted areas of needed improvement (Oyewumi et al., 2012).

Plaza et al. (2007) completed a cross-sectional study to demonstrate a curriculum mapping technique and its use in program evaluation. The authors mapped learning outcomes (domains) set forth by the Center for the Advancement of Pharmaceutical Education. They mapped the courses by year and course number and then shaded the domains addressed in each course. The domains related to patient care, dispensing medications, health promotion, professionalism, and health systems and management. The authors identified the number of competencies within each domain (Plaza et al., 2007). In the study, each cohort of students, from years one to three, rated the extent to which the curriculum focused on each domain. The authors compared the mapping they completed to the results reported by the students (Plaza et al., 2007). The mean rating of domain coverage was the same among students in years one through three for all domains except health systems and management. Students in the first year of the program reported much less coverage in the domain of health systems and management than did the students in years two and three. This technique provided faculty with data important to address the curriculum sequence.

Watts and Hodgson (2015) developed a methodology and conceptual framework to map assessment across the social work curriculum at an Australian university. In the first stage of this study, the researchers identified student competencies based on the standards set by the Australian Association of Social Workers Practice. The authors searched the literature and

identified nine constructs related to social work practice and applied them to teaching and learning (Watts & Hodgson, 2015). The constructs were sorted by the number of criteria related to each domain of social work practice (Watts & Hodgson, 2015). In the second phase, they mapped the curriculum using Bloom's Taxonomy to provide a visual representation of the scaffolding of the cognitive level of the content. The authors used findings from these two stages to improve learning outcomes, assessment, and teaching methodologies and to provide faculty development.

Merritt et al. (2012) compared the links between the learning objectives in an entry-level OT program to the competencies outlined by the Association of Canadian Occupational Therapy Regulatory Organization. The researchers analyzed the course objectives using Bloom's Taxonomy. They examined whether the course objectives were in alignment with the accreditation standards and the OT competencies defined by each program's faculty (Merritt et al., 2012). They found links between learning objectives and 30 essential competencies. They found that the learning objectives were not distributed equally among the standards. This finding led them to recommend that professional regulators, educators, and practitioners work together to ensure that learning objectives and accreditation standards align effectively to produce competent OT practitioners (Merritt et al., 2012).

Sellar et al. (2017) mapped the OT curriculum at the University of South Australia. They utilized intended learning outcomes documented in individual courses and linked them to elements in the Australian Minimal Competency Standards for New Graduates (Occupational Therapy Australia, 2010). OT faculty in Australia are required to meet these competency standards in their programs just as faculty in the United States must meet ACOTE standards (ACOTE, 2013; Sellar et al., 2017). These authors used Miller's Framework of Competency to

provide a visual demonstration of the scaffolding of the content by skill (Sellar et al., 2017). Miller (1990) described the scaffolding of skill with the following terms: knowing, knowing how, showing how, and demonstrating.

Sellar and colleagues conducted a study "to examine the extent to which the documented undergraduate curriculum supported achievement of the minimum competency standards" (Sellar et al., 2017, p. 3). This study included four stages: pilot mapping, establishment of a mapping protocol, individual planning and peer review, and final group review. The authors linked the course intended learning outcomes to the competency standards. They described the number of course objectives linked to the intended learning outcomes and calculated the percentage of links to each minimal competency standard. They quantified the proportion of links at each level of Miller's (1990) pyramid, which included the ability of the student to know, know how, show how, and demonstrate a clinical skill. The authors provided a rigorous examination of the curriculum by creating a tool to map it (Sellar et al., 2017). After the tool was created, faculty in the program mapped either five or six courses. For the sake of objectivity, they chose to map courses for which they were not the instructor. Research assistants mapped all of the courses. The maps were compared. If discrepancies were found among maps, a research assistant met with the faculty member to discuss the content in more depth and resolve the differences. A final group review was done to resolve remaining differences after the research assistants and faculty met (Sellar et al., 2017).

This study was conducted prior to a review process to evaluate the future of OT practice in Australia. The authors of this study demonstrated that their curriculum effectively links student learning outcomes to competency standards and would allow them to educate students in becoming competent Australian OT practitioners (Sellar et al., 2017). These researchers reported

that curriculum mapping is a valuable tool for programmatic assessment and should be completed in future studies (Sellar et al., 2017).

Bloom and measurement experts across the United States developed a taxonomy to facilitate the creation of a test bank that accurately measures educational objectives (Krathwohl, 2002). Phillips, Smith, and Strauss (2013) adapted the taxonomy to create multiple-choice exam questions for a radiologic anatomy course. These researchers found that the taxonomy was an effective tool to identify and categorize cognitive skills associated with a deeper understanding of radiological anatomy (Phillips et al., 2013).

OT educators are responsible for assuring that anatomy-related content is adequately covered at the right cognitive level and for using the most effective teaching methodologies to develop students into competent practitioners (Carroll & Lawson, 2014; Sellar et al., 2017). Knowledge of anatomy aligns with the person-centered factors utilized by OT practitioners to design effective intervention plans (AOTA, 2010). No tool exists in OT to align anatomy course content with ACOTE standards. The purpose of this study was to establish a tool, with face and content validity, to map anatomy-related content in OT programs. The usability was assessed by utilizing the developed tool to map the anatomy content in one MSOT program.

Method

Study Design

This study was completed in four phases. In phase one, the primary researcher created a tool to map the courses related to anatomy in entry-level OT programs. The researcher assessed the face validity of the mapping tool in phase two. In phase three, a panel of five expert consultants reviewed the tool components to assess and establish content validity. The primary researcher assessed the usability of the tool in phase four by mapping and evaluating an existing

entry-level MSOT program. Approval to conduct this study was provided by the University of New England Institutional Review Board. The Institutional Review Board of the University of Indianapolis entered into a reliance agreement with the University of New England.

Development of Tool

The author designed a curriculum mapping tool. The tool was modelled from existing curriculum mapping tools (Plaza et al., 2007; Sellar et al., 2017; Watts & Hodgson, 2015) and the experience of the primary researcher, who has five years' experience teaching full-time in an entry level MSOT program. She has developed seven graduate level courses and has participated in a curriculum redesign as a member of the departmental curriculum committee. She completed a doctoral level course in curriculum design. This experience led her to make the decision to include elements of curriculum maps she identified as relevant to OT programs. See Table 2 for a list of the research studies from which the components of the map were selected.

The Blueprint (AOTA, 2010) was created to assist OT faculty members in identifying the knowledge needed by OT students. The authors of the Blueprint outlined major topics related to person-centered factors, such as physiological, motor, and sensory support. The authors acknowledged that science forms the basis of OT education and identified anatomy as one of the key sciences. They cited the skills needed to implement anatomy concepts as including assessment, intervention planning, and activity analysis.

The primary researcher used the Blueprint (AOTA, 2010) and ACOTE standards (ACOTE, 2013) to operationalize anatomy content as the person-centered factors of physiological, motor, and sensory support. OT students must gain the skills to assess the impact of these factors on occupational performance. To identify the anatomy-related content, the primary researcher chose to include in the tool the one ACOTE standard naming anatomy

(B.1.1), and the ACOTE standard subcategories relating to basic tenets/ understanding basic clinical science (B.2.2, B.2.6, B.2.7, B.2.9); screening, evaluation, and referral (B.4.2, B.4.4); and intervention planning (B.5.1).

The individual course components identified as relevant to OT education included course objectives, educational methods, assessment methods, and OT competencies (Table 2). Course objectives are defined as the area of expertise the students are expected to gain (Harden, 2001). Educational methods can be defined as the ways in which the content is delivered, such as through lectures or demonstration (Thomas & Abras, 2016). Assessment methods are defined as the ways in which learning can be assessed, such as through an objective test (Thomas & Abras, 2016). The primary researcher defined assessment methods using the self-study guide provided by ACOTE (ACOTE, 2018). These are: assignment, project, lab test, presentation, objective test, demonstration, essay test, and other. OT competencies are the skills needed for a practitioner to be entrusted to perform as an entity no longer needing supervision and are defined by OT program faculty as student learning outcomes (Thomas, 2016). For every course fulfilling the ACOTE standard related to anatomy content, the primary researcher developed a color-coded system to visually identify the level of Bloom's Taxonomy corresponding to the cognitive level of the verb used in each course objective (Harden, 2001; Krathwohl, 2002; Sellar et al., 2017).

Assessment of Face Validity of Tool

The author established face validity of the mapping tool by utilizing official documents provided by AOTA (e.g., AOTA, 2010; ACOTE, 2013), curriculum mapping studies (Harden, 2001; Plaza et al., 2007; Sellar et al., 2017), and her professional expertise as a full- time OT faculty member and doctoral student. The Blueprint (AOTA, 2010) was used to operationalize anatomy content as intrinsic or person-centered factors. The major concept of anatomy and key

concepts of assessment, intervention planning, and activity analysis were identified from the Blueprint (AOTA, 2010). The ACOTE (2013) standards which named anatomy and were related to assessment, intervention planning, and activity analysis were chosen by the primary researcher, based on her interpretation of these concepts. They were basic tenets/understanding basic clinical science (B.1.1, B.2.2, B.2.6, B.2.7, B.2.9); screening, evaluation, referral (B.4.2, B.4.4); and intervention planning (B.5.1).

Guidelines for creating the tool were found in several mapping studies. Each component included on the tool was supported by research evidence (see Table 2). The primary researcher synthesized the information from each study. The primary researcher used research evidence and her faculty experience in designing and revising coursework to determine which components to include in the tool.

Assessment of Content Validity of Tool

Content validity is defined as the amount of congruity between the items on an instrument and the domains from which the items are retrieved (DiIorio, 2005). The congruity can be assessed through gathering insights of experts (Helmer, 1967). Content validity is based on the percent of agreement among experts, and is defined as an 80% agreement among experts (Summers, 1993).

Design. The Delphi method, a protocol to systematically obtain and synthesize expert judgment, was utilized to assess the content validity of the developed tool (Helmer, 1967). Researchers found that three rounds of expert reviews were sufficient to establish consensus (Hsu & Sandford, 2007). The Delphi method was utilized in three rounds with a panel of five experts to build consensus (Hsu & Sandford, 2007; McKenzie, Wood, Kotecki, Clark, & Bray, 1999).

Participants. Researchers have established that a panel of four or five experts is sufficient to determine validity (Beck & Gable, 2001; Hsu & Sandford, 2007; McKenzie et al., 1999). Five OT faculty members with a minimum of three years of experience teaching full-time in an entry-level OT program were recruited through networking with faculty members known to the primary researcher. The primary researcher sent an email asking the individuals to consider being a part of the study. Consent was included in the first survey (see Appendix A). Participation was voluntary and responses remained confidential and secure. Inclusion criteria were identified as being a full-time educator in an entry-level OT program, familiarity with ACOTE standards, and experience with curriculum mapping and Bloom's Taxonomy. Experience was defined as having a minimum of three years' full-time teaching in an entry-level OT program and the completion of a post-professional class in curriculum design or participation in curriculum mapping for program evaluation and assessment. Exclusion criteria included individuals who could not speak English and who did not have full-time experience teaching in an entry-level OT program, even if they had experience teaching anatomy content. A $250 stipend for participation was provided through a faculty mini-grant from the Center for Excellence in Teaching and Learning at the University of New England to all participants who completed all the surveys.

Data collection procedures. Data were collected and managed using three electronic surveys administered through the Research Electronic Data Capture (REDCap) tool hosted at the University of New England. REDCap software is a neutral data collection platform developed at Vanderbilt University in 2004 (Harris et al., 2009). This secure web-based application was designed specifically to retrieve, store, and analyze data in a secure manner for research (Harris

et al., 2009). For each survey, a link was sent directly from REDCap. The primary researcher sent emails with the link as well.

In round one, an open-ended survey was sent to participants with consent (Appendix A) along with the initial tool template (Appendix B). This open-ended questionnaire was utilized to determine consensus among the participants and provide initial measures of content validity (McKenzie et al., 1999). The participants' responses to this initial questionnaire were examined by the primary researcher. Using the feedback provided by the experts, the primary researcher clarified instructions provided to the consultants in a word document along with a sample of how the tool should be completed (Appendix C).

In round two, the revised tool and the word document were sent to the experts, with a four-point Likert scale to rank each item (See Appendix D). On the scale, 1 represented "not relevant" and 4 represented "very relevant". Using this scale, the participants were instructed to rank each item on its congruence with each ACOTE standard, level of Bloom's Taxonomy identified, and relevance to the curriculum mapping process (Appendix C). The mean percentage of agreement among raters for these items was calculated (Beck & Gable, 2001). An 80% congruence was considered acceptable (Summers, 1993). All items with less than an 80% congruence were eliminated.

In round three, the final revision of the tool was sent to the participants to provide feedback (Appendix G). This step allowed the experts a final opportunity to revise judgments about the tool (Hsu & Sanford, 2007). The final revisions were incorporated into the completed tool (Appendix I).

Assessment of Usability of Tool

The usability of the mapping tool was assessed by using it to map an existing MSOT program. The courses in the curriculum which fulfilled each ACOTE standard related to anatomy content, as defined by the primary researcher, were identified. The course syllabi were gathered. The course objectives, assessment methods, level of Bloom's Taxonomy, and related OT competencies for each course were mapped using the tool. The time taken to complete the mapping process was recorded.

The tool contained eight ACOTE standards identified as relating to anatomy content and operationalized by the primary researcher as the person-centered factors identified in the Blueprint (AOTA, 2010). The courses from the sample OT program which fulfill each ACOTE standard in the tool were selected using a 2013 document developed by the program faculty that identified two primary courses fulfilling each ACOTE standard. Ten courses fulfilled these standards.

The syllabi for the 10 courses were gathered and organized. The course objectives were examined to confirm that they fulfilled one of the eight ACOTE standards identified in the tool as related to anatomy content. Courses no longer fulfilling the standards were not included in the mapping; as a result one course was excluded and nine remained. The syllabi were organized by semester.

The primary researcher identified course objectives from each of the nine courses that fulfilled each ACOTE standard related to anatomy content. These were the objectives chosen to be mapped. The OT competencies reflected the student learning outcomes developed by the faculty to define a successful OT graduate. The sample OT program faculty provided their OT competencies in the graduate student handbook of the MSOT program (OT Department, 2017). For the purposes of this study, the competencies were aligned with course objectives.

The primary researcher completed the tool with the data provided on each course syllabus. She examined each course and plotted the course objectives related to anatomy. She then identified the assessment and educational methods utilized, using information contained in the syllabus. Each course objective was categorized according to Bloom's Taxonomy levels and then color-coded accordingly. Appendix H provides the key that was used in the color-coding.

Results

This study sought to answer three research questions. Can a tool with face and content validity be established to map anatomy-related content, as defined as person-centered factors, in entry-level, pre-professional OT program curricula? What is the usability of this mapping tool by faculty designing entry-level, pre-professional, OT curricula? How is anatomy-related content, as defined by person-centered factors, integrated in one entry-level MSOT program as measured by the mapping tool?

Research Question One

Can a tool with face and content validity be established to map anatomy-related content in entry-level OT programs? This research question was answered in three phases in five months.

Phase one. A curriculum mapping tool was developed based on findings from existing studies. Researchers described curriculum mapping tools developed for various programs (Harden, 2001; Oyewumi et al.; 2012, Plaza et al., 2007; Sellar et al., 2017; Watts & Hodgson, 2015). The tool included course objectives, educational methods, Bloom's Taxonomy levels, and OT competencies. See Table 2 for studies linked to each component. The primary researcher used these components as the basis for designing the initial tool template (Appendix B).

Phase two. The initial measure of face validity was provided by the primary researcher's expertise of five years as a full-time OT educator and 20 years as an OT clinician (Beck &

Gable, 2001; Cottrell & McKenzie, 2011; McKenzie et al., 1999). Her experience in course development and assessment led her to choose the sections of the tool described in the literature and relevant to OT program design (Thomas, 2016; Thomas & Abras, 2016). The tool was also aligned with the anatomy-related content outlined in the Blueprint (AOTA, 2010) and with subsections of the ACOTE B standards (ACOTE, 2013). The researcher identified the following ACOTE subsections as related to anatomy topics: foundational content requirements; basic tenets of OT, screening, evaluation, and referral; and intervention planning (ACOTE, 2013). The standards addressing the terms and topics in the Blueprint related to anatomy were included in the tool. The standards included: B.1.1, B.2.2, B.2.6, B.2.7, B.2.9, B.4.2, B.4.4, and B.5.1. The initial tool template was created in phase one and completed in phase two (Appendix B).

Phase three. In phase three, the primary researcher utilized the Delphi technique to establish content validity (Beck & Gable, 2001; Helmer, 1967). Researchers have utilized the Delphi technique to gather the opinions of expert consultants, to craft policy, and to guide practice in the absence of theoretical foundations (Helmer, 1967). Five full-time OT faculty members served as expert consultants. They were from three programs; two of the programs were in New York, and one of the programs was in Maine. None of the consultants were from the same program as the primary researcher. The consultants' areas of clinical practice and teaching expertise were not known because these were not specified as inclusion criteria. Three of the consultants reported having three to five years' faculty experience, two consultants reported having six to eight years of faculty experience, and one expert reported having more than nine years of faculty experience. The tool was titled "Development of a Mapping Protocol for Anatomy Education in Entry-Level OT Education" (Appendix B).

Round one. The expert consultants reviewed the tool and completed the initial survey (Appendix A). A thematic analysis of the expert reviewers' comments revealed key themes. The themes included (1) additional information, (2) additional clarification, and (3) improvement in utility of tool.

Theme 1 additional information. Participants expressed confusion as to how the tool related to anatomy and person-centered factors. "I am not sure how the tool is person-centered factors yet." She stated that she did not see the connection of anatomy to occupation. "I am not sure how your anatomy course is taught, but ours is primarily science core foundations and less focused on occupation. Is there a place to put examples?" Requests were made for clarification of Bloom's Taxonomy levels. "Bloom's: How do you expect the user to generate numbers that correspond to Bloom's levels? Include a short definition of each level." As a result of these responses, the direction section of the tool was clarified, with more in-depth explanations of the relationship of the person-centered factors to anatomy, and a key with definitions of each level of Bloom's Taxonomy.

Theme 2 additional clarification. There were comments regarding the need for clarification. These comments led to the revision of the tool for round two. One participant noted, "The tool should open with clear instructions that begin with an explanation of what the tool is (i.e., detailed explanation of its intended use) and then detailed instructions on how to use it." One participant expressed a desire to have more clarification on why this tool would be more useful than others already available. "There are programs that actually do curriculum mapping-explain why this tool would be superior to other tools available to programs." As a result of these responses, a separate word document was developed with clarification of the rationale for the tool, as well as a sample of how to complete the tool (Appendix D).

Theme 3 improvement in utility of tool. There were several comments regarding ways in which the tool could be more useful and user friendly. Comments included adding more specificity to the tool and putting all the items together on one page. One participant asked the question, "Why are the various keys and instructions on different worksheets?" Another indicated that, "The words of the ACOTE standards should be included".

The primary researcher reviewed the survey with an analysis expert. She focused on the expert consultants' comments to revise the tool. The following revisions were made: adding introductory context, clarifying directions, defining the levels of Bloom's Taxonomy, and placing instructions on one page. The primary researcher provided a supplementary word document with clarified directions and an example of how to complete the tool (Appendix D). The tool and instructions were revised based on the feedback of the expert consultants.

Round two. The revised tool and detailed instructions were sent to the expert consultants, along with a second survey (Appendix C). This survey contained closed and open-ended questions, according to the procedures outlined by the Delphi method. The quantitative data were analyzed through the REDCap program. The open-ended questions were analyzed qualitatively by identifying themes. The themes and a sample of quotes related to them can be found in Appendix E.

The responses for the closed-ended questions were converted to a four-point Likert scale where 1 represented "not relevant" and 5 represented "very relevant." Responses were analyzed quantitatively using descriptive statistics. The mean percentages of agreement for each item were calculated among consultants. The threshold to maintain items was 80% congruence (Beck & Gable, 2001; Summers, 1993). Not one of the items was rated at less than 80% congruence, a

result which suggests that all items were deemed relevant to curriculum mapping by the expert consultants.

The qualitative responses were analyzed to identify themes. The themes identified included (1) additional information, (2) clarification, (3) utility of tool, and (4) positive comments.

Theme 1 additional information. After the initial revision, one participant still requested additional information by stating, "One thing I still feel this lacks is an explanation of why someone would use this tool; maybe a deeper rationale could be included in the introduction?" As a result of this response, further clarification was made to the introduction of the tool, providing a more detailed explanation of the rationale for the tool and more clarification about the ways in which anatomy is operationalized.

Theme 2 clarification. A comment was made regarding whether this tool is useful for practice-based and lecture-based courses. One participant said, "The topics seem relevant. Is it just for anatomy or other courses? The introduction states it is for anatomy." Another participant indicated that, "I believe that evaluation and intervention planning are more relevant standards that seem to align more with practice-based courses rather than core foundational science courses."

The experts wanted additional clarification about how the tool related to the person-centered factors of anatomy-related education and ACOTE standards. One participant indicated that, "The tool should include all ACOTE standards so that a program can map to ensure they have met them all-but maybe I am not understanding the function of the tool."

Theme 3 utility of tool. These comments relate to usability of the tool. One participant commented, "Under section IV. Educational Methods, you may want to consider sorting those

under the existing ACOTE-recognized categories of assessment. ” Another stated, “Also, please define OT competencies.” Finally, a participant pointed out, “I like the concept of Bloom’s Taxonomy for scaffolding purposes, but maybe include a verb list so programs can ensure the correct level for the objectives.”

Theme 4 positive comments. There were several comments indicating that the participants agreed with the edits made from the first revision. “The revisions definitely explain the tools more clearly.” “I can see the evolution of this revision from the first draft.” This suggested that the tool was evolving in a positive manner.

Round three. The tool and instructions were revised based on the feedback given by the expert consultants in round two. The final survey tool review was collected and examined to determine themes of reviewers’ comments in round three (Appendix G). The themes from the experts’ feedback included (1) tool completed and (2) final clarification needed.

Theme 1 tool completed. Two of the five participants stated that they had “Nothing further to add.”

Theme 2 final clarification needed. The remainder of the comments focused on a request for seeing a more detailed example of the tool. One participant commented that, “I would love to see a chart example, fully completed for anatomy, and a summary of the usefulness of the tool- a sort of ‘bring it all home’ document.” Another said, “I think the ‘what’ and ‘how’ are clear in the instructions, but a more explicit statement of the ‘why’ is needed, i.e. why would someone use this tool?”

Research Questions Two and Three

The questions regarding the usability of the tool and the way in which it can be used to map a curriculum were interrelated and answered together through the mapping of an MSOT

program at a private university on the East coast of the United States. The primary researcher spent ten hours completing the usability mapping. The usefulness of this mapping tool was predicated on the user agreeing with the way in which the primary researcher operationalized anatomy content. Anatomy content for the sample program examined is threaded throughout the first three semesters.

The ACOTE standards addressing anatomy-related content were fulfilled with 10 courses. The primary researcher examined corresponding course syllabi and consulted with the faculty members teaching the courses. One faculty member confirmed that Therapeutic Use of Self (OTR 614) no longer fulfilled one of the ACOTE standards. This course was eliminated from the mapping.

From the nine remaining courses, the primary researcher identified course objectives related to each of the eight ACOTE standards included in the tool. Table 3 lists the courses, objectives, and ACOTE standards. Course objectives for this program were written using the same language as the ACOTE standards, which made it possible to choose the course objectives to be mapped. Seventeen course objectives were identified along with corresponding assessment and educational methods used to address content. This information was documented onto the curriculum map. The cognitive level of the verbs utilized in the course objectives were categorized and color coded according to Bloom's Taxonomy (Appendix H). The associated color code was placed next to the course, objective, and semester on the mapping tool. This provided a visual representation of the Bloom's Taxonomy cognitive levels for the course objectives throughout the course of the program (see Appendix I). The primary researcher then matched the OT competencies to the course objectives identified from the Graduate Student Handbook of the OT department (OT Department, 2017). For example, one of the competencies

states that "Upon completion of the OT curriculum, the student will integrate knowledge from the liberal arts and sciences into OT practice" (OT Department, 2017, p. 8). This competency was assigned a course objective from Functional Anatomy and Kinesiology (OTR 520) that read "Apply concepts of biomechanics to movement." The OT competencies were recorded onto the mapping tool.

The primary researcher aligned the columns and rows to improve readability of the tool. See Appendix I for the completed pilot map of the tool showing an example of the product. The researcher used color coding to reveal that the Bloom's Taxonomy cognitive levels of each course objective increased in complexity from level 1 (demonstrate) to level 6 (create) from the first to the third semesters. It also revealed that five of the course objectives identified two cognitive levels. For example, one of the course objectives contained the verbs evaluate (level 5) and create (level 6).

Discussion

The primary purpose of this study was to establish a tool to map anatomy-related content in entry-level OT programs accredited by ACOTE. Anatomy was chosen because OT students and practitioners identify it as important to the development of clinical competency and the study of it provides essential knowledge for healthcare practitioners (Moxham & Plaisant, 2007; Schofield, 2014; Sbayeh et al., 2016). Despite the importance of anatomy to student learning (Guzman et al., 2015; Moxham & Plaisant, 2007), access to traditional methods of teaching anatomy, such as cadaver labs, is decreasing and educators are examining alternative methods of teaching students anatomy content (Agnihotri & Kalyan, 2013; Thomas et al., 2011). The primary researcher sought to create a tool to map anatomy-related content in entry-level

programs accredited by ACOTE because one does not exist (ACOTE, 2013; Carroll & Lawson, 2014; MacNeil & Hand, 2014).

ACOTE identifies one standard related to anatomy so the primary researcher operationalized anatomy-related content more broadly to include the application of anatomy-related concepts in practice. Anatomy was operationalized using the Blueprint to include person-centered factors (AOTA, 2010). Person-centered factors related to anatomy content include intrinsic aspects of the individual, such as perceptual, motor, and sensory skills. Knowledge of anatomy is needed for OT students and practitioners to gain competency in assessment, intervention planning, and activity analysis related to these intrinsic aspects of the individual (AOTA, 2010). Therefore, the operational definition of anatomy for this study included anatomy-related content consisting of person-centered factors (perceptual, motor, and sensory) included for assessment, intervention planning, and activity analysis.

Those who disagree with this operational definition of anatomy, or who do not clearly see the link between anatomy and the person-centered factors, would not agree that this tool fulfills the purpose of mapping anatomy-related content. The mapping tool does not provide a measure of the anatomy content taught, such as bones, muscles, joints, and nerves. It implies that anatomy must be understood in order to provide assessment and intervention for person-centered factors.

Faculty can use this tool to provide a structure to assess whether anatomy-related concepts are taught as they are identified in the course objectives. In a program without a designated anatomy course, such as the sample MSOT program in this study, faculty must make assumptions about the anatomy-related content. For example, one must agree that in order to analyze the effects of heritable diseases on the occupational performance of clients, as stated in a course objective from Biopsychosocial Dimensions of Adults (OTR 515), one must possess an

understanding of anatomy in a person without heritable diseases. The sample program integrated anatomy throughout the curriculum.

In another example, a course objective was written as stating that a "student will identify the muscles of the forearm which extend the wrist with 90% accuracy" and implies that students know those specific muscles. In one course from the sample MSOT program, Applied Upper Extremity Intervention (OTR 525), an objective was written as stating that students will "apply understanding of upper extremity knowledge to normal and abnormal movement patterns." Students do not have to identify correctly the muscles involved in those movements, but they must apply the anatomy knowledge. This sample MSOT program does not have a stand-alone anatomy course, nor did any of the course objectives measure anatomy content. However, the tool provided a structure to examine where and how anatomy-related content is taught in the curriculum. Future research comparing the mapping of the current sample program (with anatomy content integrated throughout the curriculum) with an OT program with a specific anatomy course would be useful to compare to this pilot mapping.

Course instructors utilize verbs in course objectives to identify what students will be able to do by the end of the course. Six cognitive levels of verbs are identified in Bloom's Taxonomy. The use of this taxonomy provided a way to demonstrate the scaffolding of the cognitive level of each objective over time (Krathwohl, 2002). The primary researcher devised a color-coded system to provide a visual representation of the scaffolding of the anatomy-related material (Appendix H). The tool was useful in identifying the progression of the course objectives, according to Bloom's Taxonomy, to ensure that course content was presented at increasingly complex levels throughout the curriculum. All programs, even those using ACOTE standards as

course objectives, could use this visual representation to assess the cognitive level and progression of curriculum objectives.

When using this tool, faculty can clearly see the progression of the cognitive level of the verbs (Appendix H). For example, in the model MSOT curriculum, the cognitive level of the courses in the first semester are two and three, “understand” and “apply”, which are color coded in blue. The cognitive level of the courses in the third semester are level six, create, which is color coded in green. See Appendix I for a visual representation of the progression of the cognitive levels of the course objectives in the model MSOT program. Engaging in the color coding process also helps faculty members determine if the verbs used in the course objectives align. For example, one of the course objectives in the model MSOT curriculum contained the verbs “evaluate” (level 5) and “create” (level 6). Requiring students to master two levels in one objective makes it difficult to design effective assessment measures.

The tool can be useful as a first step to ensure that a variety of educational and assessment methods are utilized throughout the curriculum. It contains a section in which the faculty can map the educational and assessment methods utilized for each course. Faculty can use this information as a measure of content, and then compare it against resources describing best methods for each type of teaching (Thomas & Abras, 2016).

For example, experiential learning, such as simulation, is an effective educational method to teach a demonstration skill, such as performing joint range of motion (Thomas & Abras, 2016). Through the use of the map, it was revealed that in Functional Anatomy and Kinesiology (OTR 520), simulation was used to teach this skill, and a lab test was identified as the most effective assessment method. Lecture was the main educational method identified in two of the practice courses, Biopsychosocial Dimensions of Adults (OTR 515) and Applied Upper

Extremity Intervention (OTR 525). According to Thomas and Abras (2016), lecture is appropriate in some cases for the cognitive problem-solving needed for practice courses. However, other methods (such as team-based, problem-based, and experiential learning) may be more appropriate. The information gained from this mapping was discussed with the members of the curriculum committee of this program and has been useful in the process of curriculum revision. The mapping process revealed to faculty the types of educational methods employed. Faculty can use this knowledge to better understand how they addressed anatomy-related content in the curriculum.

Through the use of the tool, faculty are provided with a way to identify anatomy-related content, as defined by person-centered factors in a curriculum. The usefulness of the tool as a measure of the quality of the curriculum is dependent on the course instructors' ability to write measurable course objectives, at the appropriate cognitive level, utilizing the most effective educational and assessment methods for each type of content. For example, a student must know anatomy (Bloom's cognitive level 1), in order to apply the knowledge (Bloom's cognitive level 3) and evaluate (Bloom's cognitive level 5) the anatomy-related concepts as defined as person factors (e.g., physiological, sensory, and motor support) (Krathwohl, 2002) for OT practice.

Five mapping studies were used to identify the components utilized in the tool designed for this study (Harden, 2001; Oyewumi et al., 2012; Plaza et al., 2007; Sellar et al., 2017; Watts & Hodgson, 2015). None of the other tools contained all of the components needed to map anatomy content related to specific ACOTE standards. The final mapping tool included: semester, course objective, assessment method, educational method, ACOTE standards, and OT competencies.

This study builds upon the curriculum mapping study done by Sellar et al. (2017) who designed a tool to map OT content in Australia. Their tool utilized the Australian minimal competency standards to operationalize a successful OT student graduate (OT Australia, 2010). These standards include broad categories of skill, such as the ability to gather information and set goals, which are divided into performance criteria, such as the ability to gather information needed for assessment (OT Australia, 2010). Sellar et al. (2017) utilized these standards as student learning outcomes, which they linked to course objectives. The tool in this current study was also designed to link course objectives to student learning outcomes. In the usability mapping, these outcomes were operationalized as those developed by the OT department as the definition of an ideal graduate of the program (OT Department, 2017). Sellar et al. (2017) utilized Miller's pyramid as a way for faculty to scaffold the level of learning of the course objectives, whereas the tool in this study utilized Bloom's Taxonomy for scaffolding (Krathwohl, 2002).

The tool created for this study is unique as it addresses anatomy-related content fulfilling ACOTE standards (ACOTE, 2013). This tool can be used to review course objectives, evaluate assessment and educational methods, to link course objectives to Bloom's Taxonomy level, and to identify where in the curriculum students are learning the OT core competencies as defined by the OT program. In this study, the primary researcher used the student learning outcomes developed by the course faculty as the measure of OT competency (OT Department, 2017). To make the tool relevant to each program, faculty would need to operationalize OT competencies in the way which most closely aligns with their program philosophy.

A future direction would be to create a tool to assess anatomy content in OT programs accredited by other bodies, such as the Canadian Occupational Therapy Regulatory

Organization. A similar process could be completed in which the researcher in a Canadian university links accreditation standards to course objectives and the competency standards for new graduates set forth by the university.

The primary researcher found it was possible to design a tool to map content related to anatomy in entry-level OT programs in the United States. This tool gives an accurate measure of anatomy-related concepts if the course objectives are written to identify those concepts and if anatomy is operationalized in terms of person-centered factors. If the course objectives are not written to include anatomy, then the tool provides an indirect measure of it, and requires follow-up with course faculty to identify the exact scope of the anatomy being taught. The tool can still be used, but will require the extra step of seeking clarification from the faculty, a step which is essential to the accreditation review process.

The process of completing the pilot-mapping tool was useful for curricular refreshment and re-accreditation. The process revealed that, due to course revisions, one course no longer fulfilled the ACOTE standard for which it was assigned. This information was useful to know when the program completed its interim accreditation report.

The tool can be expanded to map an entire curriculum for program development or to inform preparation for re-accreditation. For example, the basic structure could be used and can be expanded to include all of the ACOTE B standards (ACOTE, 2010). This study successfully mapped the course objectives related to the specific ACOTE standards included in the tool. In future studies, every course objective for every course could be mapped.

This tool can be adapted to evaluate other areas of OT entry-level programs. Future research expanding the tool to map all of the accreditation standards may be beneficial to faculty examining curriculum decisions. It could also be utilized for other professions, by replacing the

ACOTE standards with accreditation standards from other disciplines. Using the tool to complete a study comparing and contrasting two ACOTE accredited programs, with very different approaches to delivering anatomy content, would be useful. An example would be to compare the program in this study, which does not have a stand-alone anatomy course, to a program with a stand-alone anatomy course. The results could be examined in relation to student satisfaction and objective measures of success in OT school.

All of the researchers in previous mapping studies, with the exception of Harden (2001), had multi-person teams developing the tools (Oyewumi et al., 2012; Plaza et al., 2007; Sellar et al., 2017; Watts & Hodgson, 2015). This structure allowed them to expand the scope of the tools (Plaza et al., 2007; Sellar et al., 2017) and have objective researchers examine curriculum content. For example, Plaza et al. (2007) mapped the entire pharmacy curriculum. This current study was completed by one researcher who chose anatomy to align with her teaching interest and the OT profession's need to examine the scope of anatomy education (Carroll & Lawson, 2014; Schofield, 2014). This approach limited the scope of the tool and narrowed its usefulness. The tool gives a visual representation of the courses identified as fulfilling the ACOTE standards, and as a way to begin to evaluate the curriculum. It provides an indirect measure of anatomy and requires follow-up to measure anatomical concepts.

The primary researcher chose courses to map anatomy content in an MSOT program for which she was a faculty member. This allowed access to the course materials necessary for mapping but may have led to assumptions not obvious to outside observers. She knew the curriculum well and may have identified content in the hidden curriculum not obvious to others examining the actual curriculum. For example, she teaches several of the courses in the curriculum, and knows that the discussion of heritable diseases such as diabetes, requires

knowledge of anatomy and physiology. To an independent researcher mapping this course content, those links may not be seen. They would only be noted if they were identified in the course objectives or through a discussion with the course faculty. This personal knowledge may have led the primary researcher in this study to conclude that this tool is a better measure of anatomy-related content than can be objectively measured. If the methodology of this current study had a step in which the researcher requested that faculty confirm the content taught in each course, the tool may have revealed more or less accurate measures of the curriculum content.

Use of this tool can serve as an initial step in curriculum assessment. It was designed to map content related to ACOTE standards. For these courses, it provides a visual representation of the scaffolding of the content and the relationship among the course objectives, educational and assessment methods, and the OT competencies. To use the information learned from mapping to inform curriculum decisions to strengthen a program, further analysis would be needed.

Study Limitations

One limitation of this study was that the expert consultants were chosen through a network of faculty known to the primary researcher. Therefore, the sample may not have been representative of all faculty who teach in OT programs. The inclusion criteria specified only that the faculty teach full-time in an OT program, not that they had specific teaching experience with anatomy. These criteria may have affected the findings because faculty who teach the more advanced concepts related to practice may not equate them to anatomy-related knowledge. In future studies, it would be helpful to include participants with expertise more closely defined as relating to anatomy.

Another limitation is that this study had only one primary researcher. Other curriculum mapping studies examined (Plaza et al., 2007; Sellar et al., 2017; Watts & Hodgson, 2015) had more than one researcher; hence, they had resources to map an entire curriculum. In addition, they were able to utilize objective faculty members and research assistants who did not teach any of the courses being mapped. Thus, they were able to map only the objective course content and not include hidden content.

Conclusion

The primary researcher in this study found that it was possible to design a useful tool that could be used by faculty to map anatomy-related content in entry-level OT programs accredited by ACOTE. Mapping can be time consuming and overwhelming to faculty members who may not feel competent in this skill. This mapping tool provides a structure for examining the curriculum to assist faculty with curriculum review. The tool can be useful as a first step to ensuring that a variety of educational and assessment methods are utilized throughout the curriculum.

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Table 1

Anatomy Identified in Blueprint for Entry-Level Education (AOTA, 2010)

Person-Centered Factors	Skills	Area of Practice
Physiologic Support	Assessment	Children and Youth
Sensory Perceptual Support	Intervention Planning	Productive Aging
Motor Support	Activity Analysis	Rehabilitation, Disability, and Participation
	Environmental Strategies	Work and Industry
	Assistive Technology	Mental Illness
	Self-Management strategies	Health and Wellness
	Use of Virtual Tools	

Table 2

Research Utilized to Devise Tool Components

Component	Harden, 2001	Oyewumi et al., 2012	Plaza et al., 2007	Sellar et al., 2017	Watts & Hodgson, 2015
Area of Expertise	X	X			
Year in Which Course Occurs		X	X		
Specific Course Mapping		X			
Course Objectives (Intended Learning Outcomes)		X		X	
Assessment Methods/ Educational Methods	X				
Accreditation Standards				X	X
Scaffolding of Content (Bloom's Taxonomy or Miller's Level)	X			X	
Professional Competencies		X	X		X

Table 3

ACOTE Standards and Identified Courses from Sample MSOT Program

ACOTE Standard	***COURSE 1***	***COURSE 2***
B.1.1	OTR 520 Functional Anatomy and Kinesiology	OTR 525 Applied Upper Extremity Intervention
B.2.2	OTR 505 Foundations of OT	OTR 502 Analysis of Occupation
B.2.6	OTR 502 Analysis of Occupation	OTR 513 Biopsychosocial Dimensions of Mental Health and Wellness
B.2.7	OTR 502 Analysis of Occupation	OTR 614 Therapeutic Use of Self
B.2.9	OTR 515 Biopsychosocial Dimensions of Adults	OTR 513 Biopsychosocial Dimensions of Mental Health and Wellness
B.4.2	OTR 529 Integrative Cases of Adults	OTR 610 Integrative Cases of Children and Youth
B.4.4	OTR 513L Interventions for Mental Health and Wellness	OTR 515L Interventions for Adults: Adult Orthopedic and Neurological Intervention
B.5.1	OTR 529 Integrative Cases of Adults	OTR 610 Integrative Cases of Children and Youth

Appendix A

Participant Consent Form

University of New England.

Consent for Participation in Research

Project Title: Development of a Mapping Tool for Anatomy Education in Entry-Level OT Programs

Principal Investigator(s): Mary Elizabeth Patnaude, MS, OTR/L Introduction:

Please read this form. You may also request that the form is read to you. The purpose of this form is to give you information about this research study, and if you choose to participate, document that choice. You are encouraged to ask any questions that you may have about this study, now, during or after the project is complete. You can take as much time as you need to decide whether or not you want to participate. Your participation is voluntary.

This study is being done as part of the requirements for the primary investigator to earn a Doctor of Health Science degree from the University of Indianapolis. The study participants are five full-time OT faculty with a minimum of three years' experience teaching full-time with some expertise in curriculum design and familiarity with accreditation standards of the Accreditation Council of OT Education (ACOTE).

As part of the study, you will be asked to answer a three part survey on the validity of the tool being developed for curriculum mapping. In the first part, you will be asked to complete an open-ended survey on the completed instrument. The instrument will be revised based on this feedback. In the second part, you will be asked to rank each item of the revised survey on a four point Likert scale. The instrument will be revised again. In the third part, you will be asked for your final comments on the instrument. There are no risks or direct benefits for taking part in this study. Participation in this study will cost you approximately 4 hours of your time. Your privacy

will be protected by the removal of personal information from surveys. Data will be kept confidential by being collected and managed through a secure, web-based application, REDCap, which was specifically designed to store and analyze data in a secure manner for research. It will managed through the University of New England.

Your participation is voluntary. Your decision to participate will have no impact on your current or future relations with the university. Your decision to participate will not affect your relationship with Mary Elizabeth Patnaude, MS, OTR/L. You may skip or refuse to answer any question for any reason. If you choose not to participate there is no penalty to you and you will not lose any benefits that you are otherwise entitled to receive. You are free to withdraw from this research study at any time, for any reason. If you choose to withdraw from the research there will be no penalty to you and you will not lose any benefits that you are otherwise entitled to receive. You will be informed of any significant findings developed during the course of the research that may affect your willingness to participate in the research. If you sustain an injury while participating in this study, your participation may be ended. You may choose not to participate. If you have any further questions, you may contact, the researcher conducting this study, Mary Elizabeth Patnaude, MS, OTR/L.

For more information regarding this study, please contact mpatnaude1@une.edu. If you choose to participate in this research study and believe you may have suffered a research related injury, please contact Mary Elizabeth Patnaude, MS, OTR/L. If you have any questions or concerns about your rights as a research subject, you may call Olgun Guvench, M.D. Ph.D., Chair of the UNE Institutional Review Board at (207) 221-4171 or irb@une.edu.

You will be given a copy of this consent form by request.

Signature

Appendix B

Initial Tool Template

	Course	Course Objectives	Assessment Methods	Educational Methods*	Basic Tenets/ Understanding Basic Clinical Science					Screening, Evaluation, and Referral					Intervention Planning		OT Competencies
					B.1.1	B.2.2	B.2.6	B.2.7	B.2.9	B.4.2	B.4.4				B.5.1	B.5.6	
Semester 1	1																
	2																
	3																
Semester 2	1																
	2																
	3																
Semester 3	1																
	2																
	3																

Level of Bloom's		
Level 1 Remember		
Level 2 Understand		
Level 3 Apply		
Level 4 Analyze		
Level 5 Evaluate		
Level 6 Create		
	Total	0
		#DIV/0!
		#DIV/0!
		#DIV/0!
		#DIV/0!
		#DIV/0!
		#DIV/0!
	Percent of Total	#DIV/0!

Directions for completing tool
1) Choose courses in curriculum that primarily fulfill each ACOTE standard listed above
2) Place course in table under appropriate year
3) Type in each course objective
4) Color code each objective using the color coded schema provided
5) Use key provided to identify the educational method utilized to fulfill each course objective

Appendix C

Word Document Containing Clarified Instructions

I. Introduction to Tool

1) This tool is designed to align with the topic of person factors in OT education outlined in the *Blueprint for Entry-level Education.* The authors of the Blueprint identify the sciences related to this topic, one of which is anatomy, and discuss the skills needed to be developed in order to implement interventions related to person factors. Anatomy is identified as one of the sciences related to physiological, sensory/perceptual, and motor support of or impact on performance. The skills identified include those related to assessment and intervention planning. Therefore, the ACOTE standards chosen to be mapped relate to the science of anatomy and concepts related to anatomy that are utilized in assessment and intervention planning. In addition, this tool will give the user a visual of the scaffolding of content related to Bloom's Taxonomy across the curriculum.

II. Directions for Completing the Tool

1) Choose courses in the curriculum that primarily fulfill each ACOTE standard.
2) Place course in table under the appropriate semester type in each course objective, assessment method, and educational method utilized in each course. Examples of assessment methods may be lecture exam, practical exam, and presentation.
3) Color code each objective, based on the level of Bloom's Taxonomy, using color coded schema provided.
4) Use the key provided to identify the educational methods utilized to fulfill each course objective.
5) Identify the program competencies related to each topic.

III. Bloom's Taxonomy Color Coding:

Color-code each cell adjacent to the course objectives, according to the following level of Bloom's Taxonomy:

Level of Bloom's Taxonomy	Definition of Level	Color of Corresponding Cell
Level 1: Remember	Recall Information	
Level 2: Understand	Explain Idea or Concept	
Level 3: Apply	Use Information in Another Situation	
Level 4: Analyze	Break Information Into Parts	
Level 5: Evaluate	Justify a Decision or a Course of Action	
Level 6: Create	Generate a New Idea or Concept	

IV. Educational Methods which may be utilized in OT Curriculum

1) Readings
2) Lectures
3) Online Resources
4) Discussion
5) Problem-Based Learning
6) Team-Based Learning
7) Peer Teaching
8) Real-Life and Supervised Clinical Experiences

9) Role Models

10) Demonstration

11) Simulation and Artificial Models

12) Role-Plays

13) Standardized Patients

14) Audio or Video Review of Learner

15) Behavioral/Environmental Intervention

V. Sample of Completed Tool: The following chart may give you an example of how the tool may be completed.

	Course	Course Objective	Assessment Method(s)	Educational Method	ACOTE Standard B.1.1
Semester 1	Introduction to Anatomy	Demonstrate knowledge and understanding of the structure and function of the human body	Lab exam	Simulation	

ACOTE Standard Example

B.1.1 Demonstrate knowledge and understanding of the structure and function of the human body to include the biological and physical sciences. Course content must include, but is not limited to, biology, anatomy, physiology, neuroscience, and kinesiology or biomechanics.

Appendix D

Revised Tool for Round Two

Patnaude Dissertation Survey Version 2

Thank you for taking part in this project and for completing the first survey. The following survey was developed based on the feedback given in the first survey.

1) Last Name _____

2) First Name _____

_____

_____

University of New England

Curriculum Tool Validation Part 2

Thank you for completing the first survey to validate the tool. Revisions were made based on the feedback given. Please complete the following survey based on the revisions made.

The following documents provide a more in depth explanation of the use of the tool as well as a sample of how the tool may be completed.

[Attachment: "Mapping Tool for ACOTE Standards Related to Person Factors in Entry Word Document.docx"] Please review the revised version of the tool before completing the following survey.

[Attachment: "Mapping Tool for ACOTE Standards Related to Person Factors in OT.xlsx"]

The following section will ask for your feedback regarding the revisions made to the tool following the first survey.

3) Please provide your comments thoughts and feedback on the revised title of this tool. _____
4) Please suggest an alternative title if you feel it would be appropriate. _____
5) Does the explanation provided contribute to your understanding of the purpose of the tool? ○ Yes ○ No
6) Please comment on whether you feel the directions and explanation for the purpose of the tool are clear? _____

This tool is designed to align with the topic of person factors in OT education as outlined in the Blueprint for Entry-level Education. The authors of the Blueprint identify the sciences related to this topic, one of which is anatomy, and discuss the skills needed to be developed in order to implement interventions related to person factors. Anatomy is identified as one of the sciences related to physiological, sensory/perceptual, and motor support of or impact on performance. The skills identified include those related to assessment and intervention planning. Therefore, the following ACOTE standards were chosen to be mapped related to the science of anatomy and concepts related to anatomy that are utilized in assessment and intervention planning. In addition, this tool will give the user a visual of the scaffolding of content related to Bloom's Taxonomy across the curriculum.

Please rate each item of the tool.

1= Not Relevant 2= Somewhat Relevant 3= Relevant 4=Very Relevant

7) Semester Number
8) Course
9) Course Objectives
10) Assessment Methods
11) Educational Methods
12) ACOTE Section Headings (Re: Basic Tenets)
13) OT Competencies
14) Bloom's Taxonomy Level

Keeping in mind the explanation provided above, please rate the relevance of each of the following ACOTE standards to the validity of the tool.

1=Not Relevant 2=Somewhat Relevant 3=Relevant 4=Very Relevant

15) B.1.1 Demonstrate knowledge and understanding of the structure and function of the human body to include the biological and physical sciences. Course content must include, but is not limited to, biology, anatomy, physiology, neuroscience, and kinesiology or biomechanics.
16) B.2.2 Explain the meaning and dynamics of occupation and activity, including the interaction of areas of occupation, performance skills, performance patterns, activity demands, context (s) and environments, and client factors.
17) B.2.6 Analyze the effects of heritable diseases, genetic conditions, disability, trauma, and injury to the physical and mental health and occupational performance of the individual.
18) B.2.7 Demonstrate task analysis in areas of occupation, performance skills, performance patterns, activity demands, context(s) and environments, and client factors to formulate an intervention plan.
19) B.2.9 Express support for the quality of life, well-being, and occupation of the individual, group, or population to promote physical and mental health and prevention of injury and disease considering the context (e.g., cultural, personal, temporal, virtual) and environment.
20) B.4.2 Select appropriate assessments using appropriate procedures and protocols (including standardized formats) and use occupation for the purpose of assessment.
21) B.4.4 Evaluate client(s)' occupational performance in activities of daily living (ADLs), instrumental activities of daily living (IADLs), education, work, play, rest, sleep, leisure, and social participation. Evaluation or occupational performance using standardized and non-standardized assessment tools includes: the occupational profile, client factors, performance patterns, context, and performance skills.
22) B.5.1 Use evaluation findings based on appropriate theoretical approaches, models of practice, and frames of reference to develop occupation-based intervention plans and strategies (including goals and methods to achieve them) on the basis of the stated needs of the client as well as data gathered during the evaluation process in collaboration with the client and others. Intervention plans and strategies must be culturally relevant,

reflective of current OT practice, and based on available evidence. Interventions address the following components: occupational profile, client factors, performance patterns, context, performance skills including motor and praxis skills, sensory-perceptual skills, emotional regulation skills, cognitive skills, and communication and social skills.
Please review the following ACOTE standards in order the next question.
[Attachment: "ACOTE Standards 2012.pdf"]

23) Please add any ACOTE standards you feel are missing from the tool.

24) Please list any items on which you would like further clarification.

Appendix E

Coding of Survey

Theme	Quote
Additional Information	"The tool should include all ACOTE standards so that a program can map to ensure they have met them all- but maybe I am not understanding the function of the tool".
	"Also please define OT competencies".
Additional Clarification	"One thing I still feel this lacks is an explanation of why someone would use this tool; maybe a deeper rationale could be included in the introduction?"
	"The topic name seems relevant. Is it just for anatomy or for other courses? The introduction states it is for anatomy".
	"I believe that evaluation and intervention planning are more relevant standards that seem to align more with practice based courses rather than core foundational science courses".
	"I am still a little unclear. Is the purpose of this to look at accreditation standards? Or for mapping student progression or for overall mapping a particular curriculum?"
	"You have created a good tool that provides a crosswalk between ACOTE standards and Bloom's learning objectives, but the connection of any of this to 'person factors' you reference in the introduction is not clear."
	"…i.e. why would an OT educator use this tool?"

Improvement in Utility of Tool	"Under section IV. Educational Methods, you may want to consider sorting those under the existing ACOTE-recognized categories of assessment".
	"I like the concept of Bloom's Taxonomy for scaffolding purposes, but maybe include a verb list so programs can ensure the correct level for their objectives".
Positive Comments	"The revisions definitely explain the tools more clearly".
	"I can see the evolution of this revision from the first draft".

Appendix F

Instructions for Completing Tool Version 3

Mapping Tool for ACOTE Standards Related to Person Factors in Entry-Level OT Curricula

VI. Introduction to Tool

This tool is designed to align with the topic of person factors in OT education outlined in the Blueprint for entry-level education. The authors of the Blueprint identify the sciences related to this topic, one of which is anatomy, and discuss the skills needed to be developed in order to implement interventions related to person factors. Anatomy is identified as one of the sciences related to physiological, sensory/perceptual, and motor support of or impact on performance. The skills identified include those related to assessment and intervention planning. Therefore, the ACOTE standards chosen to be mapped in this tool relate to the science of anatomy and concepts related to anatomy that are utilized in assessment and intervention planning. ***This tool can be adapted for use in other courses, by adding columns with additional ACOTE standards.*** An additional blank column is included in the tool to facilitate customization (See example below). In addition, this tool will give the user a visual of the scaffolding of content related to Bloom's Taxonomy across the curriculum.

VII. Directions for Completing the Tool

Choose courses in the curriculum that primarily fulfill each ACOTE standard. Place the course in the table under the appropriate semester. Type in each course objective, assessment method, and educational method utilized in each course. Examples of assessment methods may be lecture exam, practical exam, and presentation. Color code each objective, based on the level of Bloom's Taxonomy, using color coded schema provided. Use the key provided to identify the educational methods utilized to fulfill each course objective.

Identify the program competencies related to each topic. Although these may be identified more specifically by each academic program, the following list may be helpful. Effective use of: activities and occupations, preparatory methods and tasks, education and training, advocacy, and group intervention.

VIII. Bloom's Taxonomy Color Coding:

Color-code each cell adjacent to the course objectives, according to the following level of Bloom's Taxonomy:

Level of Bloom's Taxonomy	Definition of Level	Color of Corresponding Cell
Level 1: Remember	Recall Information	
Level 2: Understand	Explain Idea or Concept	
Level 3: Apply	Use Information in Another Situation	
Level 4: Analyze	Break Information Into Parts	
Level 5: Evaluate	Justify a Decision or a Course of Action	
Level 6: Create	Generate a New Idea or Concept	

IX. Educational Methods which may be utilized in OT Curriculum

Readings

Lectures

Online resources

Discussion

Problem-based learning

Team-based learning

Peer Teaching

Real-life and supervised clinical experiences

Role models

Demonstration

Simulation and artificial models

	Course	Course Objective	Assessment Method(s)	Educational Method	ACOTE Standard B.1.1	Additional Standards	OT Competencies
Semester 1	Introduction to Anatomy	Demonstrate knowledge and understanding of the structure and function of the human body.	Lab test	Simulation			Preparatory methods

Role-plays

Standardized patients

Audio or video review of learner

Behavioral/environmental intervention

X. ACOTE Assessment Methods

1. Assignment
2. Project
3. Lab Test
4. Presentation
5. Objective Test
6. Demonstration
7. Essay test
8. Other

XI. Sample of Completed Tool: The following chart may give you an example of how the tool may be completed.

ACOTE Standards

B.1.1 Demonstrate knowledge and understanding of the structure and function of the human body to include the biological and physical sciences. Course content must include, but is not limited to, biology, anatomy, physiology, neuroscience, and kinesiology or biomechanics.

B.2.2 Explain the meaning and dynamics of occupation and activity, including the interaction of areas of occupation, performance skills, performance patterns, activity demands, context (s) and environments, and client factors.

B.2.6 Analyze the effects of heritable diseases, genetic conditions, disability, trauma, and injury to the physical and mental health and occupational performance of the individual.

B.2.7 Demonstrate task analysis in areas of occupation, performance skills, performance patterns, activity demands, context(s) and environments, and client factors to formulate an intervention plan.

B.2.9 Express support for the quality of life, well-being, and occupation of the individual, group, or population to promote physical and mental health and prevention of injury and disease considering the context (e.g., cultural, personal, temporal, virtual) and environment.

B.4.2 Select appropriate assessments using appropriate procedures and protocols (including standardized formats) and use occupation for the purpose of assessment.

B.4.4 Evaluate client(s)' occupational performance in activities of daily living (ADLs), instrumental activities of daily living (IADLs), education, work, play, rest, sleep, leisure, and social participation. Evaluation or occupational performance using standardized and non-standardized assessment tools includes: the occupational profile, client factors, performance patterns, context, and performance skills.

B.5.1 Use evaluation findings based on appropriate theoretical approaches, models of practice, and frames of reference to develop occupation-based intervention plans and strategies (including goals and methods to achieve them) on the basis of the stated needs of the client as well as data gathered during the evaluation process in collaboration with the client and others. Intervention plans and strategies must be culturally relevant, reflective of current OT practice, and based on available evidence. Interventions address the following components: occupational profile, client factors, performance patterns, context, performance skills including motor and praxis skills, sensory-perceptual skills, emotional regulation skills, cognitive skills, and communication and social skills.

Appendix G

Final Survey

Confidential

Page 1 of 1

Patnaude Dissertation Survey Part 3

Thank you for completing the previous survey. Edits were made to the tool and the instructions for completing the tool in response to the previous survey. This is the final request for comments. Please provide any final thoughts you may have on the current version of this survey.

1) First Name _____
2) Last Name _____

   Please review the revised mapping tool in order to answer the survey question.

   [Attachment: "Mapping Tool for ACOTE Standards Related to Person Factors in OT_Revised_09_13_18.xlsx"]

   Please review the revised instructions and sample tool to answer the survey questions.

   [Attachment: "Mapping Tool for ACOTE Standards Related to Person Factors in Entry_Revised_09_13_18.docx"]

3) After reviewing the revised instrument and instructions, please provide final comments and/or

Revisions you would like to be made.

Appendix H

Bloom's Taxonomy Color Coding

Color-code each cell adjacent to the course objectives, according to the following level of Bloom's Taxonomy:

Level of Bloom's Taxonomy	Definition of Level	Color of Corresponding Cell
Level 1: Remember	Recall Information	
Level 2: Understand	Explain Idea or Concept	
Level 3: Apply	Use Information in Another Situation	
Level 4: Analyze	Break Information Into Parts	
Level 5: Evaluate	Justify a Decision or a Course of Action	
Level 6: Create	Generate a New Idea or Concept	

Appendix I

Final Completed Tool With Usability

	Course	Course Objectives	Assessment Methods	Educational Methods	Basic Tenets/ Understanding Basic Clinical Science					Screening, Evaluation, and Referral		Intervention Planning	OT Competencies (From MSOT Student handbook)	Additional Standards to Include (Use if you would like to map the curriculum beyond these		
					B.1.1	B.2.2	B.2.6	B.2.7	B.2.9	B.4.2	B.4.4	B.5.1				
Semester 1	Functional Kinesiology and Anatomy	1. Demonstrate knowledge of: structure of human body, joint range of motion, and manual muscle testing	Objective test	Readings/ Lectures									Integration of knowledge from the liberal arts and sciences into occupational therapy practice			
		2. Describe movement, strength and postural alignment	Objective test	Readings/ Lectures												
		3. Apply concepts of biomechanics to movement	Objective test	Lectures/ demonstration												
		4. Perform kinematic evaluation, measure and record range of motion	Lab Test	Demonstration												
				Simulation and artificial models									Integration of knowledge from the liberal arts and sciences into occupational therapy practice			
													Recognize and value the essential contribution/composition of everyday occupations for health promotion and well-being.			
	Foundations of Occupational Therapy	Explain the meaning and dynamics of occupation and activity including areas of occupation and performance skills.	Assignment/Project/Presentation/Objective Test/Demonstration	Discussion/lectures									Apply evidence to support occupation throughout the lifespan			
Semester2	Analysis of Occupational Performance	1. Demonstrate an understanding of the OT Process											Select interventions for managing a client-centered plan throughout the OT process.			
		2. Apply concepts of learning theory to teaching and learning											Articulate and apply evidence that supports entry level competence in person-centered and occupation-based practice for people of all ages.			
		3. Create and analyze activities and occupations in relation to occupational therapy											Recognize and value the essential contribution/composition of everyday occupations for health promotion and well-being.			
		4. Design goals based on activity analysis														
		5. Analyze activities from the OT practice framework														
	Biopsychosocial Dimensions of Mental Health and Wellness	Demonstrate knowledge and understanding of the biopsychosocial dimensions of human behavior including disability, mental health concerns and diagnoses, heritable diseases, trauma-informed care, recovery principles, and pharmacological/ non-pharmacological interventions.	Assignment/Objective test	Discussion/demonstration									Select interventions for managing a client-centered plan throughout the OT process, for children, adolescents, adults, older adults and their supports with physical and/or cognitive impaiments.			
	OT Interventions in Mental Health and Wellness Lab	1. Select and use appropriate procedures protocols and assessment tools (including standardized and non-standardized) based on individual client needs and incorporating occupation in the assessment process whenever possible.	Lab test/assignment/project	Demonstration/simulation/ discussion									Integrate innovative, technological, and creative resources and strategies into assessment, intervention, and outcomes across populations and context.			
		Use is mapped at appropriate level														
	Biopsychosocial Dimensions of Adults: Adult Neurological and Orthopedic Rehabilitation	Analyze evidence obtained from the occupational profile to identify factors that influence the occupational performance of clients with orthopedic, neurological and chronic health conditions.	Objective test/assignment	Lecture/discussion									Recognize and value the essential contribution/composition of everyday occupations for health promotion and well-being.			
	Interventions for Adults with Neurological and Orthopedic Conditions	Evaluate client(s) occupational performance in activities of daily living (ADLs) and instrumental activities of daily living (IADLS) using standardized and non-standardized tests.	Lab test/ demonstration	Demonstration/simulation/ discussion									Select interventions for managing a client-centered plan throughout the OT process.			
		Use is mapped at appropriate level														
	Applied Upper Extremity Intervention	Apply understanding of upper extremity knowledge to normal and abnormal movement patterns. Analyze the effects of heritable diseases, genetic conditions, disability, trauma, and injury to the physical and occupational performance of the individual	Objective test	Discussion									Integrate innovative, technological, and creative resources and strategies into assessment, intervention, and outcomes across populations and context.			
		Analyze mapped at appropriate level														
	Integrative Practice With Adults	1. Use current evidence to select appropriate models of practice and frames of reference when designing an intervention plan.	Assignment/ Objective test	Team-based learning/ discussion									Utilize multi-modal types of clinical reasoning to implement interventions for client-centered service provision.			
		select mapped at appropriate level														
		2. Select appropriate assessment tools and interpret evaluation results for intervention planning including consideration of culture, disability status, and individual situational variables.	Assignment	Team-based learning/discussion									Select interventions for managing a client-centered plan throughout the OT process.			
Semester 3	Integrative Practice With Children and Youth	Use evaluation findings based on appropriate theoretical approaches, models of practice, and frames of reference to develop occupation-based intervention plans and strategies (including goals and methods to achieve them).	Assignment	Real life and supervised clinical experiences/ Discussion									Utilize multi-modal types of clinical reasoning to implement interventions for client-centered service provision.			
		Develop mapped at appropriate level														