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Abstract

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Keywords

Professional reasoning, clinical reasoning, self-determination theory, occupational therapy education, experiential learning

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Self-Determination Theory and Professional Reasoning in Occupational Therapy Students: A Mixed Methods Study

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ABSTRACT

Occupational therapy (OT) education frequently utilizes experiential learning as an effective instructional method to develop professional reasoning in OT students. However, there is little information about the development of professional reasoning. The researchers used a mixed-methods design to determine the extent to which an experiential learning course was effective in supporting professional reasoning ability with thirty-six OT students. Participants were students enrolled in an experiential learning course, which was part of their didactic graduate curriculum. Students attended an assigned setting weekly for sixteen weeks. Researchers collected data using the Self-Assessment of Clinical Reflection and Reasoning (SACRR) as well as reflective journaling. Pre-post scores on the SACRR were analyzed using repeated measures ANOVA and showed a statistically significant increase in self-perceived professional reasoning. The researchers analyzed journals from the perspective of Self-Determination Theory (SDT) using the tenets of competence, relatedness, and autonomy. Students developed professional reasoning along a continuum of competence to relatedness to autonomy. The results show that this progression does not occur in perfect stages or on a defined timeline, and provides novel insights into how the progression occurs. Occupational therapy educators can apply the results to better facilitate student development of professional reasoning. Further research could determine how to best employ SDT in OT education.

INTRODUCTION

Occupational therapists (OTs) use professional reasoning to make decisions when working with clients. The workforce expects new graduates to enter the field with this vital skill set in place in order to meet a variety of needs in a complex healthcare environment (Furze et al., 2015; Henderson, Coppard, & Qi, 2017; McCannon, Robertson, Caldwell, Juwah, & Elfessi, 2004; Scaffa & Wooster, 2004). Therefore, developing student competence in professional reasoning is a critical role of OT educational programs.

Many educators and researchers have discussed the development of professional reasoning; however, there is no consensus on how to best facilitate or measure students' development of professional reasoning (Johnson, Seif, Coker-Bolt, & Kraft, 2017; Maloney & Griffith, 2013; Naber & Wyatt, 2014; Seif et al., 2014; Unsworth & Baker, 2016). Researchers in dental education have used self-determination theory (SDT) to study the development of professional reasoning (Orsini, Evans, & Jerez, 2015). Self-determination theory's concepts of competence, relatedness and autonomy can guide OT educators in creating appropriate assignments and experiences to better facilitate student development of professional reasoning. It is difficult to evaluate instructional methods and effectiveness of assignments and experiences within the OT curriculum without understanding the development of professional reasoning in students.

LITERATURE REVIEW

Professional Reasoning

There are a variety of definitions present in the literature and used interchangeably for both professional reasoning and clinical reasoning. Henderson et al. (2017) define clinical, or professional, reasoning as "a high level, cognitive thought process that integrates professional and acquired knowledge to deliver OT services in various contexts with clients with complex concerns" (p. 2). Professional and clinical reasoning also employ factual knowledge, practical working knowledge, and instinctual reactions to clients and situations (Unsworth & Baker, 2016). Professional reasoning is more inclusive of a variety of OT practice settings and will be the term used in this paper.

Professional reasoning evolves from novice to expert and little information exists on how this skill set develops for the novice (Unsworth & Baker, 2016). Unsworth and Baker (2016) conducted a systematic review and found eight articles in the OT literature that focused on the development of professional reasoning. The authors concluded there were no agreed upon definitions of novice and expert therapists in the literature, and some OTs never seem to achieve expert status. However, the researchers found that use of reflective practice is an effective method to facilitate professional reasoning development in OTs and students, but there are limited studies specifically describing this in OT students (Unsworth & Baker, 2016).

Experiential Learning

Experiential learning, defined as a hands-on experience to compliment didactic coursework, is an effective method present in OT curricula to support students in the development of professional reasoning (Coker, 2010; Knecht-Sabres, 2013). With experiential learning, group projects and individual assignments occur in parallel with practical experience with organizations or clients. Instructional strategies for the development of professional reasoning are designed to guide students in applying practical experiences to didactic content (Hills & Levett-Jones, 2017; Knecht-Sabres & Kovic, 2013).

Hills and Levett-Jones (2017) conducted a systematic review on the preferred learning methods of health professions students. They reported that 85% of recent health professions students preferred hands-on learning and actual practice versus any other instructional method related to learning clinical skills. Knecht-Sabres and Kovic (2013) completed a retrospective mixed-methods study over a two-year time period with a total of 74 OT graduate students enrolled in an adult practice course. The qualitative results indicated that student self-perception of competence in OT-related skills increased based on experiential learning. Both the quantitative and qualitative results indicated that students improved their professional reasoning abilities as a result of experiential learning (Knecht-Sabres & Kovic, 2013).

Phillips (2017) conducted a mixed methods study with 32 OT students enrolled in experiential learning placements outside of traditional OT practice settings. The students demonstrated improvement in self-perceived ability in multiple areas, such as: goal setting, powerful questioning, coaching strategies and intervention, and readiness to change. Through student reflections, the authors also noted that students requested the opportunity to participate in experiential learning across a variety of traditional and emerging settings (Phillips, 2017). These studies generally support the use of experiential learning as an effective instructional strategy and support the connection to development of professional reasoning, but lack a framework for enhancing instructional strategies to support the students.

Reflective Journaling

Reflective journaling is an educational technique that compliments experiential learning to promote professional reasoning development. Reflective journaling is a process of free writing that encourages reflection on clinical experiences. Often, educators will use guiding questions to focus student reflections. Bazyk, Glorioso, Gordon, Haines, and Percaciante (2010) and Maloney and Griffith (2013) conducted studies with students enrolled in an experiential learning course who had completed guided reflective journaling assignments. They identified themes of professional reasoning development providing insight for instructional methods to employ with students during the course in the future (Bazyk et al., 2010). Bazyk et al. (2010) described six themes related to professional development and they included: anticipation of the experience, effortful planning, "doing" the groups, reflecting on the doing, becoming an OT, and meaning of the experience. Maloney and Griffith (2013) defined the following eight themes: developing trust, establishing boundaries, communication, client-centered care,

breakdown of preconceptions, increased self-awareness, the power of pride, and the power of occupation. These themes provide a scaffold for understanding novice and advanced beginner phases of professional reasoning development. However, the researchers are not aware of any studies that sought to describe student development of professional reasoning theoretically.

Self-Determination Theory

According to SDT, intrinsic and extrinsic motivation influence human nature (Ryan & Deci, 2000). People perform better, have improved self-esteem, and report higher quality of life when they are internally motivated. People are motivated to satisfy three basic needs: competence, relatedness, and autonomy. The degree to which tasks and environments fulfill each need impacts an individual's feelings of well-being (Ryan & Deci, 2000). Competence is described as feeling capable in one's own performance and finding a just-right challenge. Relatedness refers to a person's drive to feel connected to another person or community and autonomy refers to decision-making based on a person's values, needs and free will (Orsini et al., 2015).

Educational programs support intrinsically motivated learning when a student has the opportunity to be competent, related to others, and autonomous. For example, guided learning activities that provide the just-right challenge help students feel competent in their work, allow for application to personal experiences, and foster self-directed learning. However, in most didactic settings, measures of performance are more frequently related to external motivation in the form of grades based on completion of structured assignments and exams (Niemic & Ryan, 2009), which may not translate well to practice settings.

Self-determination theory supports the notion that students have natural tendencies to learn and will flourish when teachers tap into these tendencies (Niemic & Ryan, 2009). Self-determination theory is less prominent in health professions literature but relates to a clinical or experiential learning environment. Understanding the pursuit of competence, relatedness, and autonomy offers insight into why many students tend to thrive in a clinical or experiential setting by considering their motivation to learn. The addition of a client to the learning experience also assists in driving students to desire self-determined decision-making and supports early client contact in didactic curricula (Orsini, Binnie, & Wilson, 2016). In a clinical teaching environment, students benefit from autonomy-supportive teaching, which includes student choice in assignments and reflective learning (Orsini et al., 2015). Students also desired feedback on effectiveness (or competence) in their educational pursuits, as well as feelings of connectedness with the learning situation (or client). The authors concluded that more work is needed to apply SDT to health professions education, specifically via mixed methods research (Orsini et al., 2015).

The researchers aimed to examine the development of professional reasoning in third year OT students enrolled in an experiential learning course. Students were in a variety of practice settings including outpatient, community-based, and home-based settings. The researchers conducted a mixed methods study with the Self-Assessment of Clinical

Reflection and Reasoning (SACRR) and reflective journaling. Research questions included: 1) Did students enrolled in a course utilizing experiential learning techniques increase self-perceived competency in professional reasoning? and 2) Based on SDT, how did students develop professional reasoning?

METHODS

Research Design

The researchers used a mixed methods design to explore the development of professional reasoning of OT graduate students engaged in an experiential learning course. For the quantitative portion, the researchers used a retrospective pretest/posttest design with student completion of the SACRR, which was an assignment in the course. The researchers used an inductive approach to collect data through the use of student reflective journaling assignments completed three different times during the previous semester. This approach allowed findings to emerge from the raw data. The University of Missouri Institutional Review Board approved this retrospective study without need for informed consent because the researchers only had access to de-identified data.

Participants

The researchers used a retrospective convenience sample of 36 OT graduate students enrolled in an experiential learning course as part of their didactic curriculum. The students completed the SACRR as an assignment for the course on the first and sixteenth weeks of class, as well as reflective journal assignments on the first, eighth, and sixteenth weeks of class.

Course description. The experiential learning course placed students in a direct client-contact setting weekly for 10-12 weeks of a 16 week semester. Depending on the nature of the setting, some students participated individually at a site, while others participated in a group. Clinical faculty members provided supervision but students were responsible for planning and providing direct client care. Table 1 describes the individual settings.

All students completed an identical set of assignments, with application to their specific settings, meant to foster competence in professional reasoning. At their individual site, students completed the following assignments: an occupational profile for one client, a concept map detailing the OT process, weekly session planning forms, weekly documentation, creation of educational materials, creation of a data collection system, and a discharge plan. For the in-class portion of the course, students were encouraged to engage in reflection and discussion about their clients and/or setting to facilitate relatedness. Autonomous decision-making was encouraged for all students through brainstorming sessions and direct client contact, with faculty supervision diminishing as appropriate throughout the semester.

Participant demographics. Students were 88.9% female (n=32) and 11.1% male (n=4). 22.2% had previous college degrees prior to starting the OT program (n=8). The mean age of the students was 23, with a range from 22-28 years of age. All 36 students were enrolled in the second of a two-part experiential learning course as part of their final semester in their OT didactic curriculum. All students advanced to Level II Fieldwork following successful completion of the semester. Additionally, all students had previously completed three Level I Fieldwork experiences totaling 88 hours; and one additional one-week Level I experience totaling 40 hours in the same semester as the course. Table 1 shows the number of students placed at each experiential learning site.

Table 1

Experiential Learning Site Descriptions

Students	Site	Description
10	Outpatient Adult	Outpatient teaching clinic located on campus in the OT department. Students lead therapy services with faculty supervision. Client referrals vary in terms of diagnoses. Community outings and home visits occur as part of intervention.
7	Outpatient Pediatrics	Outpatient teaching clinic located on campus in the OT department. Students lead therapy services with faculty supervision. Client referrals vary in terms of diagnoses. Community outings and home visits occur as part of intervention.
5	Recreational Services	Community-based swimming lessons for children with autism. OT students are paired with swim instructors and provide services to increase success with swimming experience. OT students also work in the home with assigned swimmer and family.
4	Handwriting Group	Preschool-based community group using Handwriting Without Tears. Writing is supported with gross motor, fine motor, and multi-sensory activities. OT students also focus on transitions between activities, maintaining attention and engagement, and teacher collaboration.
3	Self-Management Group	Community-based group as well as individualized home and community intervention. The clients have Parkinson's disease and intervention focuses on increasing self-management abilities and overall well-being.

3	Life Skills Group	Community-based group for adolescents with autism. OT students plan intervention focusing on life skills, such as money management, social interaction, cooking, public outing procedures, and safety.
2	Home Health Services	Services for adults in the home. Client referrals vary in terms of diagnoses. OT students focus on individualized needs within the home environment.
2	Picky Eaters Group	Community-based group for children with picky eating. Autism is the primary diagnosis but not a requirement for the group. OT students plan interventions that encourage children to touch, smell, and taste foods; as well as provide parent education.

Instruments

Self-Assessment of Clinical Reflection and Reasoning (SACRR). Royeen, Mu, Barrett, and Luebben (2001) designed the SACRR as a 26-item self-assessment. The researchers also collected demographic data in the form of age, sex, and prior degrees. Each question has a five-point scale ranging from a 5, “strongly agree”, to a 1, “strongly disagree”. The tool is designed to assess self-perception of learning related to clinical reasoning and reflection (Johnson et al., 2017; Royeen et al., 2001; Scaffa & Wooster, 2004). The SACRR shows acceptable psychometric properties with Cronbach’s alpha of .87 for pretest and .92 for posttest, and the Spearman rank order correlation coefficient of test-retest reliability with a score of .60 (Royeen et al., 2001). The SACRR was administered in class and students were given approximately 10 minutes for completion.

Reflective professional reasoning journals. For the qualitative portion, the researchers examined the results of three separate reflective journal entries completed by each student. The questions, shown in Table 2, changed slightly throughout the semester to reflect prior didactic and experiential learning, and to foster further critical reflection as the students gained experience throughout this course (Nielson, Stragnell, & Jester, 2007). These assignments were completed outside of class and submitted via the course’s online course management system.

Table 2

Reflective Journal Questions

<p>Journal 1</p> <p>What do you plan to do differently this semester based on your clinic experience last semester?</p> <p>What additional knowledge, information or skills do you need to be successful this semester?</p> <p>Describe a situation you encountered with your client(s) during your clinical experience last semester. How did you respond? What would you do differently? What did you do well?</p> <p>Describe any challenges you felt last semester during your clinic experience.</p> <p>What do you see as your role with your prospective client this semester?</p>
<p>Journal 2</p> <p>What has been the most significant change in your thoughts about your clinic experience since week 1?</p> <p>Describe a situation you have encountered with your client(s). How did you respond? What would you do differently? What did you do well?</p> <p>Describe any challenges you feel this semester during your clinical experience.</p> <p>What additional information do you need for the remainder of your clinical experience and how will you get it?</p>
<p>Journal 3</p> <p>What has been the most significant change in your thoughts about your clinic experience since week 1?</p> <p>How were your client's priorities different than your expectations?</p> <p>Describe a situation you have encountered with your client(s) since week 8. How did you respond? What would you do differently? What did you do well?</p> <p>Describe three ways your clinical skills have expanded during this experience.</p> <p>How did this experience shape your thoughts about your future practice as an OT?</p>
<p><i>Note.</i> Questions adapted from Nielson, A., Stragnell, S., & Jester, P. (2007). Educational innovations – Guide for reflection using the clinical judgment model. <i>Journal of Nursing Education</i>, 46(11), 513-516.</p>

Data Analysis

Self-Assessment of Clinical Reflection and Reasoning (SACRR). The researchers used a pre-posttest design to analyze quantitative data. The researchers analyzed differences in pre and post scores on the SACRR using repeated measures Analysis of Variance (ANOVA). Item-level changes were also examined using repeated measures ANOVA. The alpha level was set to .05. To account for the number of comparisons involved in the item-level analysis, we used the Bonferroni correction, which adjusted the alpha level to .002. IBM SPSS Statistics Version 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) was used for the analysis.

Development of professional reasoning. The researchers used an iterative process to analyze the qualitative data in the reflective journals. First, the lead researcher used holistic coding by reading overall reflective journal passages for themes. Miles, Huberman, and Saldana (2014) describe holistic coding as a way to look at an entire set of data, rather than line-by-line coding, before defining a more detailed categorization of the data. Through this process, the researchers noticed changes in the students' journals, moving from discussing competence-based themes (e.g. treatment protocols, supporting theories, and assignment requirements), to discussions about the people they were serving, and problem solving. These themes prompted the researchers to return to the literature, where they identified SDT as a framework that encompassed the identified themes.

The researchers then used deductive coding using codes developed from SDT (i.e. competence, relatedness, and autonomy). Deductive coding allows the researcher to bring in a conceptual framework or a list of codes to apply to the data (Miles et al., 2014). The lead researcher defined the codebook, seen in Table 3. To establish reliability of the codebook, the lead researcher and a reliability rater, who was a clinical co-faculty member, coded all three reflective journal assignments for 10 students. Two subcodes consisted of a blend of competence-relatedness and relatedness-autonomy. In all, 30 journals (28% of the total) were coded for reliability. The research team compared the results between the two coders. The coders achieved 87% consistency. The lead researcher then coded the remaining 26 students' journal entries. The researchers tracked and analyzed the occurrence of each code in the journals.

Table 3

Self-Determination Theory Codebook

<p>Definition</p> <p>Self-determination theory states individuals need to feel autonomous, competent and related to their surroundings in order to achieve self-determined, intrinsically motivated actions (Orsini et al., 2016; Orsini et al., 2015).</p>		
<p>Competence</p> <p>Desire of feeling capable of performing a determined task and is related to seeking challenges that are optimal to one's abilities (Orsini et al., 2015).</p>	<p>Relatedness</p> <p>The need for belongingness or connectedness with significant others, as well as with a significant community (Orsini et al., 2015).</p>	<p>Autonomy</p> <p>Making decisions by your own will based on one's own needs and values (Orsini et al., 2015).</p>
<ul style="list-style-type: none"> • Comments made about standardized tests, equipment, specific techniques or protocols • Focused on assignments and/or meeting requirements • Relying on supervisory support • Relies on supervisory feedback to understand successes or failures • Successes or failures are related to self versus client • In general, speaks in more factual, tangible, concrete terms • Wants to perform well for his/her own reasons 	<ul style="list-style-type: none"> • Recognizes when his/her own plan does not align with client needs • Able to see things from another person's viewpoint • Reflects on the experience or learning process associated with assignments • Reflects on how own decisions affect client/others • Views the client as an expert on their own needs and in the therapeutic relationship • Feels sense of success or failure based on client progress/response 	<ul style="list-style-type: none"> • Shows confidence in abilities • Makes statements implying both competence and relatedness • Does not require supervisory feedback to understand successes or failures • Successes and failures are related to a combination of self and client progress/response • Shows an independent understanding of the next steps to take to make positive change • Makes connections between past learning, current

<ul style="list-style-type: none"> • Makes apprehensive statements about ability and future fieldwork performance • Statements seem overconfident at times without rationale 	<ul style="list-style-type: none"> • In general, speaks in more abstract, hypothetical, reflective, emotional terms • Reflects on client influence on current and future practice 	<ul style="list-style-type: none"> • experience, and need for future learning • Makes positive anticipatory statements about ability and future fieldwork performance
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RESULTS

Self-Assessment of Clinical Reflection and Reasoning (SACRR)

Repeated measures ANOVA revealed that students made significant growth in self-perceived professional reasoning based on SACRR data ($f=3.657$; $p=.018$). Post-hoc testing revealed that the significant differences were due to 10/26 items as seen in Table 4.

Table 4

SACRR Changes after Student Completion of Experiential Learning Course

	Mean pre-test	SD	Mean post-test	SD	p Value
1. I question how, what, and why I do things in practice.	4.06	.71	4.19	1.00	.392
2. I ask myself and others questions as a way of learning.	4.50	.56	4.58	.55	.446
3. I don't make judgments until I have sufficient data.	3.72	.71	3.94	.47	.044
4. Prior to acting, I seek various solutions.	3.75	.77	4.19	.52	.002*
5. Regarding the outcomes of proposed interventions, I try to keep an open mind.	4.28	.51	4.42	.55	.230
6. I think in terms of comparing and contrasting information about a client's problems and proposed solutions to them.	3.58	.69	4.25	.50	<.001*
7. I look to theory for understanding a client's problems.	3.25	.84	3.78	.72	.004
8. I look to frames of reference for planning my intervention strategy.	3.44	1.03	3.86	.64	.007

Table 4 Continued	Mean pre-test	SD	Mean post-test	SD	p Value
9. I use theory to understand treatment techniques.	3.33	.83	3.81	.67	.001*
10. I try to understand clinical problems by using a variety of frames of reference.	3.36	.87	3.83	.77	<.001*
11. When there is conflicting information about a problem, I identify assumptions underlying the differing views.	3.39	.80	3.75	.55	.017
12. When planning intervention strategies, I ask "What if" for a variety of options.	4.11	.75	4.19	.71	.597
13. I ask for colleagues' ideas and viewpoints.	4.33	.72	4.67	.48	.003
14. I ask for the viewpoints of clients' family members.	3.64	.99	4.39	.55	<.001*
15. I cope well with change.	3.50	.94	3.81	.72	.020
16. I can function with uncertainty.	3.50	.88	3.89	.67	.006
17. I regularly hypothesize about the reasons for my clients' problems.	3.86	.68	4.14	.59	.048
18. I must validate clinical hypotheses through my own experience.	3.53	.77	3.83	.77	.010
19. I clearly identify the clinical problems before planning intervention.	4.03	.51	4.17	.56	.230
20. I anticipate the sequence of events likely to result from planned intervention.	3.75	.69	4.31	.67	<.001*
21. Regarding a proposed intervention strategy, I think, "What makes it work?"	3.58	.84	4.31	.62	<.001*
22. Regarding a proposed intervention, I ask, "In what context would it work?"	3.92	.73	4.33	.48	.001*

Table 4 Continued	Mean pre-test	SD	Mean post-test	SD	p Value
23. Regarding a particular intervention with a particular client, I determine whether it worked.	4.19	.52	4.39	.60	.017
24. I use clinical protocols for most of my treatment.	3.28	.70	3.75	.91	.006
25. I make decisions about practice based on my experience.	3.81	.71	4.42	.60	<.001*
26. I use theory to understand intervention strategies.	3.17	.97	3.78	.68	<.001*
*denotes significant change using Bonferroni correction of alpha level to .002.					
<i>Note.</i> SACRR items from Royeen, C., Mu, K., Barrett, K., & Luebben, A.J. (2001). Pilot investigation: Evaluation of clinical reflection and reasoning before and after workshop intervention. In P. Crist (Ed.), <i>Innovations in occupational therapy education</i> (pp. 107-114). Bethesda, MD: American Occupational Therapy Association. Reprinted with permission.					

Development of Professional Reasoning

The reflective journals for 36 students, administered at three different time points throughout the project (first week, eighth week, and sixteenth week), were analyzed using codes derived from SDT (described in Table 3). Self-determination theory provided a theoretical basis to analyze student development of professional reasoning. The researchers hypothesized that as students developed proficiency in professional reasoning, they would move from a focus on competence (i.e. focused on assignments and expectations) to a focus on relatedness (i.e. client-focused) and autonomy (i.e. independent problem solving). Figure 1 shows the occurrence of codes in journals throughout the semester. The progression demonstrates students' advancement from a focus on competence, moving to relatedness, and finally in many cases to autonomy. Figure 2 shows that competence represented the largest phase with this participant sample.

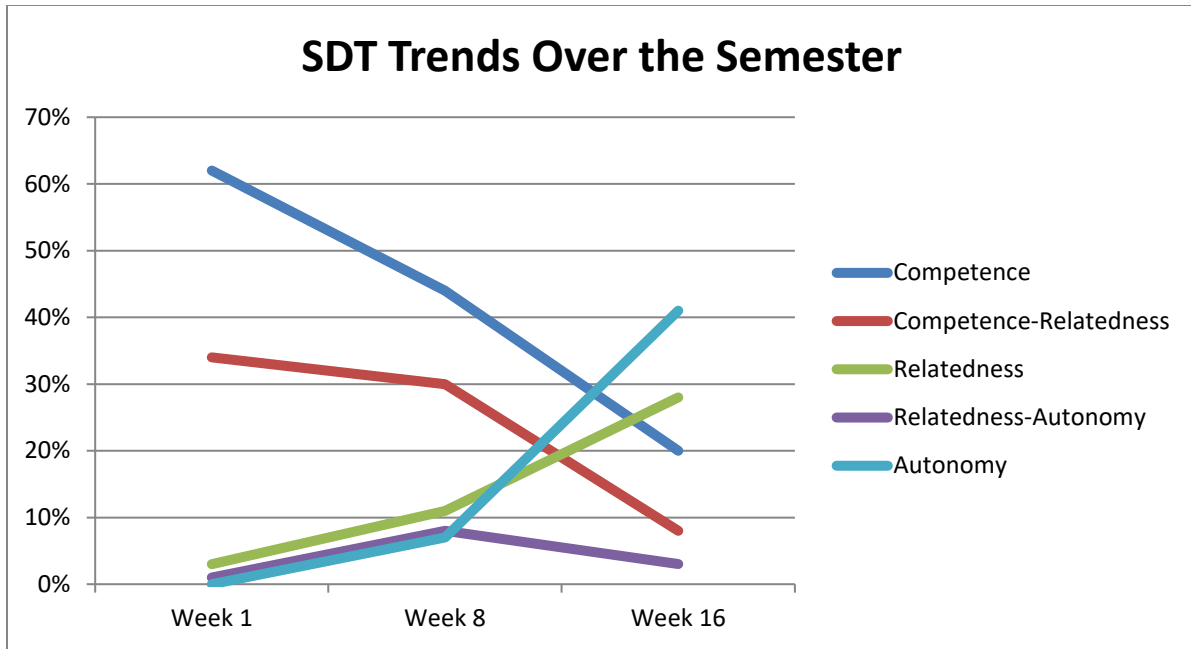


Figure 1. Self-determination trends over the semester.

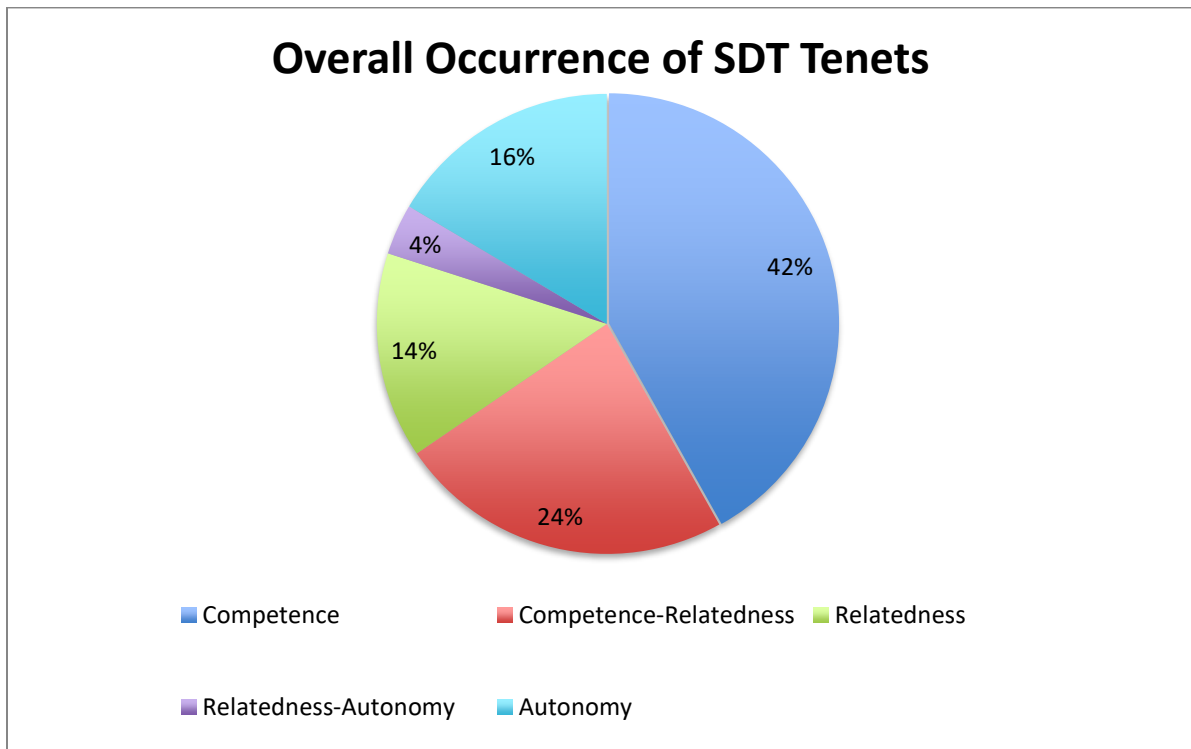


Figure 2. Overall occurrence of self-determination theory tenets.

Competence: Focusing on developing skills and completing assignments.

Students described feeling anxious in the planning phase of the experiential learning course. They spoke frequently of assignments, protocols, and diagnostic facts. For example, one student wrote, "I hope to become independent in my ability to use my resources to gain knowledge, my knowledge of diagnoses and intervention, and becoming more confident with my clinical reasoning." The client(s) was rarely mentioned in the reflections and the focus was egocentric. Another student reflected "I will need to understand how to structure groups more efficiently and also how to use the CO-OP method. We have done a number of group projects, but I have never done any with real clients besides swim lessons...It will also be interesting to see how CO-OP works with the [adolescent] population as well." The students focused on seeking feelings of competency. "I think having a go-to document with ideas if I ever get stuck in a rut or can't think of what to do will be beneficial for me and help me feel more reassured." Students expressed feeling reliant on his or her faculty supervisors and other external resources. "I do not have much experience with children...now, I feel a lot more comfortable and was happy [my faculty supervisor] was able to model how to act with children and provide feedback on how to use my language."

Competence-relatedness: Beginning to see the connection to the people served.

This subtheme represents a transition phase when students continued to seek competency but began to factor in contributions from their client(s). "A challenge that I enjoy with this client and his family is being creative in trying to think of interventions that will be genuinely helpful for them, as they are busy, often overwhelmed, and open to suggestions." The students continued to view the activity and preparation as a success or failure, but started to recognize the client role. One student in an outpatient setting who was supporting a person to do his or her laundry reflected that "I came up with a pronation/supination activity that required my client to scoop laundry detergent and it failed epically. The scoop was too narrow and flimsy for my client. Looking back I would not have even attempted this activity, I would have come up with a different activity that required less materials. My client appears to prefer bottom-up interventions." The students attempted to problem-solve how to address client needs while still prioritizing competency. Another student expressed a challenge she was having with finding motivation for a client "He is motivated by increasing his ability to perform leisure tasks. He wanted a wrist cock-up splint to use [to play his guitar] to help with his wrist position. Again, we are going to try and see if any inhibition of tone can be achieved through weight bearing that transfers over to his guitar playing ability. I plan to bring in a ukulele and see if this instrument is more functional for him to play. Besides these ideas, I am at a loss for occupation-based interventions that he wants to work on besides guitar. Our next session, I plan to ask him more about woodworking and find meaningful occupations."

Relatedness: Taking the client perspective to heart. Students engaged in significant reflection specifically related to the client in this phase of professional reasoning development. They were able to recognize the client(s) as a contributor in the therapeutic relationship. The students occasionally expressed being surprised by their clients: "I think I expected that the clients would want to learn about things like cooking

and budgeting, but in reality, it was more that they enjoyed learning about interacting socially. Their parents also had expectations about working on hygiene, which originally I didn't realize was such a big priority for these kids." The students expressed thoughts about specific incidents and showed increasing client-centeredness. One student reflected on a self-feeding activity: "my client had significant difficulty cutting his pancakes at breakfast and bringing to his mouth with a fork. I responded using graded cuing...he refused hand-over-hand facilitation and grew frustrated...I helped him stab the cake with his fork and was able to calm him. I wished I would've approached it differently and helped him remain calm sooner as I think his frustration and embarrassment made it much more difficult for him." Students reflected on their own ability to engage the client(s) without focusing on competency driven self-performance. "Having a more casual relationship with my client and his family has allowed me to be more direct in asking questions and has also allowed me to understand the way their family functions enough to feel enabled to approach situations from a coaching perspective."

Relatedness-autonomy: Allowing the client perspective to influence decision-making. This subtheme represents a second transition phase from reflection in relatedness to include plans for intended change. Students spoke about acceptance and need for changes in their plans with their client(s). A student in a home health setting reflected that she "was nervous and excited to go into someone's home in the most natural context possible. I wasn't able to plan out sessions as detailed as I would in [a clinic setting] and had to learn to roll with the punches...and accept what was most important for the client in terms of treatment. Often I would come in to start but my client was in too much pain. I learned to do what was most important for the client at that time and incorporate it into my treatment plan." Students described how their thoughts expanded and the potential implications for modifying their current practice. One student in a community-based preschool setting reflected, "at first I did not think I would learn very much from a typical classroom setting, but I have learned so much! It has broadened my knowledge so much about kids and developmental levels, I had no idea so many different levels could be considered the norm." Another student engaged in the self-management group described, "It is important for me to realize where the actual needs are for my client so that I can truly provide a beneficial experience to them that will improve their independence and function. With this knowledge I can change my approach to provide treatment in the community...and desired areas that will improve their overall well-being."

Autonomy: Feeling confident in their ability. Students described feelings of confidence and achievement. They made connections reflective of both competency and relatedness. A student in a community-based life skills group stated "I will not be afraid to lead a group like this in future practice and can easily see the benefits of this type of group therapy." Students described changes they will incorporate into future practice. "I definitely think that [self-management] is going to be incorporated with every client I see, no matter the diagnosis. I think the principles...can be such a game changer for people day-to-day when they learn to incorporate them. While self-management is individualized, identifying the barriers and solutions, even small

changes, can really impact a person's quality of life." Students started to speak about their aspirations for their future careers. "I have been set on practicing in adult rehab, although, I know I have had a good amount of success working with pediatrics. Now that I'm set on doing travel therapy, I will definitely consider a pediatric placement when I start my career. I will be excited to explore many different practice areas." Students reflected on their own growth throughout the semester. "I am typically someone who likes a plan...working in someone's home; however, does not provide that experience. Every week, I would start working with my client on whatever she was doing, whether that was makeup, cooking, laundry, or stretching. It allowed me to stay on my toes and use tasks around her home to provide therapy." Another participant described, "my clinical skills have expanded by being able to come up with interventions easily and quickly, especially when things don't go exactly as planned."

DISCUSSION

The results demonstrated that a course focused on experiential learning supported development of students' professional reasoning. The researchers identified pathways to the development of professional reasoning that were rooted in SDT. In addition, the significant change in SACRR scores indicated students experienced an increase in self-perceived professional reasoning ability. The findings compliment previous research in support of experiential learning as an effective instructional method to develop professional reasoning in OT students. The use of SDT in the analysis, however, provided novel theoretical insights into how professional reasoning develops.

Self-Perceived Professional Reasoning

The students showed a significant increase on the SACRR for 10/26 items, indicating a substantial improvement in self-perceived professional reasoning ability. Many studies have shown the effectiveness of experiential learning on the development of professional reasoning (Coker, 2010; Johnson et al., 2017; Scaffa & Wooster, 2004; Seif et al., 2014) and this study extends those results. Seif et al. (2014) and Johnson et al. (2017) administered the SACRR with health professions students engaged in an interprofessional experiential learning course and results showed 5/26 and 6/26 items on the SACRR resulted in significant change. In comparison, this study showed a larger 10/26 items with significant change. This may have been due to the participants being graduate students, as well as the variety of placements for experiential learning in this course.

The students also engaged in reflective journaling, which facilitated development of self-perceived professional reasoning by creating increased insight into their own abilities (Bazyk et al., 2010). Having increased insight into their abilities, based on their reflections on their experiences, may have also contributed to a larger number of SACRR items showing significant change. It is important in terms of curriculum development to have a method to reliably measure student response to activities that contribute to successful development of professional reasoning. Educators need to provide support and opportunities to enhance students' abilities to engage in professional reasoning at a high quality level. However, providing these opportunities

proves difficult without a full understanding of how clinicians achieve expert status (Unsworth & Baker, 2016).

While the SACRR is reliable in measuring self-perception of professional reasoning, there continues to be disagreement in the literature on how this development actually occurs. Specifically the OT literature base lacks a consistent operational definition of professional reasoning, a consistent way to measure it, and an agreed upon progression of professional reasoning development (Unsworth & Baker, 2016). Many of the items in Table 3 that do not indicate a significant change, suggest themes of autonomy. Readers should use this interpretation of the data with caution since SDT was not used in the creation of the SACRR; however, it corresponds to the distribution of themes found in the qualitative data and suggests that students can achieve autonomy in professional reasoning but are more successful at satisfying competence and relatedness.

Development of Professional Reasoning

Using SDT as a conceptual basis for understanding professional reasoning provides insight specifically into health professions education. General education typically does not require the same intensity, timing, client contact, and need for clinical work as health professions education (Orsini et al., 2016). This study showed that in the early stages of the experiential experience, students expressed thoughts and actions related to competency. In previous literature, this was described as a planning phase or novice phase (Bazyk, et al., 2010; Unsworth & Baker, 2016), where students are most concerned with the technical aspects of the experience and are concerned with fulfilling their assignment requirements. Students initially equated success with achieving high praise from their faculty supervisors, completing an assignment, or performing well on a set intervention plan. They also expressed a need for knowledge to feel prepared with their client(s), and frequently turned to theory, textbooks, and classmates for reassurance. Self-determination theory informs us that competence is an individual's need to feel capable (Orsini et al., 2015) and to engage in a "just-right" challenge as OTs often state. Educators can focus on assignments and experiences that provide opportunities for students to feel competent, which might involve group work, guided learning, opportunities for frequent feedback, and discussion (Henderson et al., 2017). Educators should also be hesitant to harshly judge a student's efforts when they are clearly functioning in a competency-seeking phase, and could instead recognize they are at the beginning phases of this continuum and seek solutions to help them move toward relatedness.

Occasionally, students' reflections would reflect themes that blended competence-relatedness and relatedness-autonomy. For example, a student experiencing competence-relatedness might continue to focus on fulfilling assignment requirements but starts to recognize that client(s) may not fit perfectly into the assignment requirements. As the same student progresses and experiences relatedness-autonomy, the focus shifts more toward fulfilling the client needs. The student is likely to begin thinking of ways to adapt the assignment to fit the client in this phase. These blends

demonstrate that the students were experiencing a progression in skill, which is not expected to happen in perfect stages.

As students learned new competencies and became comfortable in their settings, a progression from focusing on their personal competence to focusing on relatedness and autonomy occurred. The students' second journal reflected this midway through the semester, which showed increasing themes of relatedness. Instead of focusing on their assignments, they began to listen more to the people they were serving and realized that the people often had better ideas or at least more insight into their own issues. Self-determination theory helps us understand that relatedness is an individual's need for belonging and connection to others, the environment, or the community (Orsini et al., 2015). At this phase educators can facilitate student reflection through instructional methods, paying particular attention to how the client(s) now factors in to the decisions they make. Many students did not reach this phase until the end of the semester, reinforcing the fact that this is a continuum without perfect stages or a defined timeline. As an educator, this information becomes important in understanding why some students succeed at using their own professional reasoning more rapidly than others. There may be instances in which an educator can create an assignment that encourages a student to better relate to their client(s), but in a checklist manner, for example, that satisfies that student's continued need to feel competent.

In the third reflective journal, which the students completed at the end of their experience, students expressed continued feelings of relatedness, and in some cases competence, as well as autonomy. The students expressed themes related to autonomy, where they reflected on decision-making grounded in theory and evidence, successful occupation-based interventions, an understanding of outcomes, and direction for the future of their own careers. These reflections demonstrated a level of professional reasoning expected of students preparing for longer-term clinical experiences (e.g. level II fieldwork) (Henderson et al., 2017).

According to SDT, autonomy is an individual's ability to make decisions based on their own values, knowledge, and ability (Orsini et al., 2015). The incidence of autonomy was lower in this study, which the researchers expected given the students' position in their education (the students still needed to complete 24 weeks of clinical placements prior to graduating). Many students did not achieve autonomy, which could mean that students are still struggling with balancing classroom expectations with practical realities in their settings. Self-determination theory provides a scaffold to assist OT educators in guiding student learning through competence to relatedness to autonomy. Since little evidence currently exists on the nature of how OT practitioners achieve expert status with professional reasoning (Unsworth & Baker, 2016), SDT provides a lens through which OT educators can create lifelong, intrinsically motivated learners.

Limitations

This research examined one class of students from one program and took place over one semester. This study also lacked a control group of students not enrolled in the experiential learning course. These issues limit the generalizability of the findings to all

OT students and programs. Yet, the findings indicate that using a SDT perspective to support students during experiential learning experiences may promote professional reasoning development. Future research might expand the utility of SDT in program development.

Implications for Future Research

The findings indicate the need for further research. Researchers in OT could explore the relationship between professional reasoning development and specific sites/clientele for experiential learning to determine the different impacts of a placement. Researchers could also consider comparison between programs with and without experiential learning courses. Researchers would benefit from the use of a standardized tool to measure professional reasoning, such as the SACRR, in addition to collecting qualitative data. Secondly, researchers should consider a method for coding qualitative data that explicitly explores professional reasoning development. Lastly, researchers can investigate each of the 26 SACRR items further and determine if there is a relationship to SDT so they can facilitate higher levels of student success based on answers on the SACRR.

CONCLUSION

Self-determination theory explains that most adults require competence, relatedness, and autonomy in order to make self-regulated and intrinsically motivated decisions (Orsini et al., 2015; Orsini et al., 2016). The results of this study indicate the same tenets of SDT can apply to the development of professional reasoning in OT students. In order to utilize professional reasoning proficiently, an OT must be competent in their skills, relate to their client, and make autonomous decisions. These concepts also assist OT educators in developing assignments and experiences that satisfy OT students' needs for competence and relatedness while encouraging autonomy. These results build upon previous literature both internal and external to OT. Educators gain insight by combining SDT with professional reasoning, which allows OT educators to better understand and foster its development in students.

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