

2019

## Critical Thinking and Transformational Learning: Using Case Studies as Narrative Frameworks for Threshold Concepts

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### Recommended Citation

Berg, C., Philipp, R., & Taff, S. D. (2019). Critical Thinking and Transformational Learning: Using Case Studies as Narrative Frameworks for Threshold Concepts. *Journal of Occupational Therapy Education*, 3 (3). <https://doi.org/10.26681/jote.2019.030313>

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# Critical Thinking and Transformational Learning: Using Case Studies as Narrative Frameworks for Threshold Concepts

## Abstract

Critical thinking is an essential component to the occupational therapy process that is a timely skill with the rapid pace of change in our healthcare system. Critical thinking exposes assumptions, biases, beliefs and points of view and challenges a shift in epistemology by asking, 'how do we know what we believe to know?' Case studies are a tool to engage the learner in critical thinking and are commonly employed in occupational therapy curricula. Social determinants of health (SDH) describe environmental circumstances that affect health. The authors propose that SDH, embedded in case studies, serve as a threshold concept. A threshold concept serves as a means of transformative learning and promotion of critical thinking in occupational therapy education. Social determinants of health taught through case study presentation represent the authentic complex lives of those therapists serve, bolster student critical thinking, and help to consider the multiple perspectives that may challenge long held beliefs. Qualitative content analysis of 59 case studies for SDH content across one curriculum and five semesters, revealed cases built on client factors and foundational knowledge with missed opportunity to add SDH context. Eleven guidelines for case development are proposed to foster transformational learning. Intentional instructional approaches can assist educational programs to develop the professional change agents needed to serve communities and populations with a larger goal of health equity.

## Keywords

Social determinants of health, qualitative content analysis, case study development

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### ABSTRACT

Critical thinking is an essential component to the occupational therapy process that is a timely skill with the rapid pace of change in our healthcare system. Critical thinking exposes assumptions, biases, beliefs and points of view and challenges a shift in epistemology by asking, 'how do we know what we believe to know?' Case studies are a tool to engage the learner in critical thinking and are commonly employed in occupational therapy curricula. Social determinants of health (SDH) describe environmental circumstances that affect health. The authors propose that SDH, embedded in case studies, serve as a threshold concept. A threshold concept serves as a means of transformative learning and promotion of critical thinking in occupational therapy education. Social determinants of health taught through case study presentation represent the authentic complex lives of those therapists serve, bolster student critical thinking, and help to consider the multiple perspectives that may challenge long held beliefs. Qualitative content analysis of 59 case studies for SDH content across one curriculum and five semesters, revealed cases built on client factors and foundational knowledge with missed opportunity to add SDH context. Eleven guidelines for case development are proposed to foster transformational learning. Intentional instructional approaches can assist educational programs to develop the professional change agents needed to serve communities and populations with a larger goal of health equity.

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### INTRODUCTION

Critical thinking is the process of analyzing and evaluating thinking used to make decisions and is an essential skill to effectively provide intervention (Huang, Newman, & Schwartzstein, 2014; Paul & Elder, 2016). Clients of occupational therapists often have complex lives, and clinicians need open-minded inquiry to understand the myriad of

factors that predict or influence healthcare outcomes (Roberts, Fisher, Trowbridge, & Ben, 2016; Tayyeb, 2013; Townsend et al., 2014). These factors, known as social determinants of health (SDH), are defined as “conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks” (Office of Disease Prevention, 2019). Social determinants of health may include such things as available community resources, access to health care, social support, economic situation, and education background (Office of Disease Prevention, 2019). Social determinants of health often direct healthcare outcomes in ways that may not be known to the health care professionals unless they raise vital contextual questions, reflect on their own biases, and analyze this relevant information using critical thinking.

Case study analysis is one learning enhancement strategy to prepare students to reflect upon and acknowledge personal assumptions and biases, as well as the client’s SDH. Contextual details enrich the occupational performance process (Fearing, Law, & Clark, 1997), challenging students to evaluate multiple layers of influence on client goals and outcomes. In pursuit of using SDH as a threshold concept and catalyst for critical thinking, a cursory review by the authors of several curricular case studies revealed a preponderance of language focused on client factors which diminishes a holistic approach by reducing a person to body functions and body structures (American Occupational Therapy Association [AOTA], 2014). Concerned that client factor language focuses on procedural learning rather than higher order critical thinking led to further exploration of the social determinants of health as a threshold concept found in the cases used in one curriculum. Frenk and colleagues (2010) offered a call to action for health care professionals to move beyond an impairment focus and become better informed of the contexts that impact care. Social determinants of health, as a threshold concept embedded in case studies, add elements of complexity, uncertainty, and context to promote critical thinking that impacts care.

The purposes of this article are to present the importance of critical thinking in occupational therapy curriculum, to connect threshold concepts to critical thinking, and to propose SDH as a threshold concept housed in case studies as one instructional approach to transform learning. Based on the analysis of SDH content in 59 cases from one entry-level occupational therapy Masters and Doctorate combined five semester curriculum, the authors proposed a guide for educators to enhance case development as an intentional instructional approach to transform learning (Schell & Schell, 2008).

## **LITERATURE REVIEW**

### **Critical Thinking in Occupational Therapy Curriculum**

Critical thinking is a skill that requires explicit instruction with emerging health care professionals (Huang et al., 2014). Sharples and colleagues (2017) suggested that without this explicit instruction, students struggle with making realistic decisions. Critical thinking is “the art of analyzing and evaluating thinking with a view to improving [your thinking]” (Paul & Elder, 2016, p. 2). Two elements of thinking not always explicitly included in professional clinical reasoning or the client- centered process include

reflecting on your point of view and the assumptions made (Paul & Elder, 2016; Schell & Schell, 2008). Working with clients requires that clinicians make critical thinking part of everyday practice. To be client centered, clinicians invoke skills to become reflective practitioners (Mattingly & Fleming, 1994). One aspect of reflection is to routinely examine personal biases and critically think about assumptions that enter interactions with clients about preferred lifestyle choices, the communities in which clients live, and client centered care decisions (Mills, Creedy, & West, 2018). The clinical reasoning study by Mattingly and Fleming (1994) defined the complex process of occupational therapy clinical reasoning. Findings revealed that therapists struggled to articulate and justify the choices they made in practice, particularly regarding the phenomenological or life experience of the client. Mattingly and Fleming wrote that clinical reasoning was not reducible to any one method of thinking. Critical thinking complements and enhances the clinical reasoning process (Sharifi, Arbabisarjou, & Mahmoudi, 2017).

### **Social Determinants of Health in Clinical Care**

Hooper (2008) reviewed some of the literature around assumptions that therapists made during therapeutic interactions and concluded that therapists have both personal and professional assumptions that may bias the therapeutic relationship. Where do assumptions come from? One source of assumptions comes from a personal SDH history. Identifying personal SDH and resultant attitudes towards others who may or may not have similar experiences can be a source of bias that impedes the development of a caring, supportive therapeutic relationship and setting collaborative, realistic, and attainable future goals (Kielhofner & Barrett, 1998; National Academies of Sciences, Engineering, & Medicine [NASEM], 2016).

The implications of reflecting upon the importance of SDH should not be overlooked or understated as SDH also could be, or contribute to, the root causes of disability, trauma, or chronic conditions. The healthcare team may need to extend their care to the household, community, or even regional population issues for intervention success. For example, hospital recidivism is a costly complex societal issue that forces teams to extend client care more comprehensively into the community, critically think about SDH, analyze team assumptions, and focus on functional and social support needs (Rogers, Bai, Lavin, & Anderson, 2016). Addressing SDH promotes non-linear thinking and provides a rich context for active learning experiences, which are often transformative in challenging previously held schemas of how the world operates. The process of engaging in transformative learning enhances effective teamwork, facilitates communication, and fosters innovative solutions (Mezirow, 1997).

### **Using Social Determinants of Health for Transformative Learning**

Frenk and colleagues (2010) defined learning by three levels: informative learning that develops expertise with knowledge and skills, formative learning that develops professionals through focusing on values, and transformative learning that develops leaders and change agents through critical thinking, decision-making, and effective teamwork. One transformative learning approach is to challenge students with the growing chasm of health disparities caused by political, social, and economic factors external to a client's control (Braveman, Cubbin, Egarter, Williams, & Pamuk, 2010).

Within a case study, students could be prompted to consider the role of community, organizations, and the state of regional population health. Critical thinking questions might include: “How did you decide the course of action you would take by reading the chart or referral?” “Why do you think this is the most important problem to consider for this client?” “Are there other perspectives that need to be considered before you proceed?” “What questions will you ask to learn about health beliefs and existence of and access to community health resources?” If the purpose of data gathering and assessment is to accurately predict who will benefit from therapy, therapists must employ critical thinking right from the beginning of the process to increase predictive accuracy (Mattingly & Fleming, 1994).

### **Critical Thinking in the Occupational Therapy Process**

Fearing and colleagues (1997) identified seven steps in the occupational therapy process that offer opportunities to use critical thinking. The first step is to name and validate the client’s perspective and circumstances. The second step is to consider a broad range of theoretical perspectives that could guide a point of view. The third is to identify environmental living contexts, such as household and neighborhood, which leads to the fourth step of identifying family and community supports for health, which could alter therapeutic perspectives. The fifth through seventh steps focus on negotiated and evaluated outcomes, to critically think about the therapist’s course of action for a household and to question assumptions and perspectives, especially if the outcome was not successful. Students must learn to appreciate and consider the ambiguity and multiple solutions present in every client situation. Mattingly and Fleming (1994) used the term conditional reasoning to describe the type of clinical reasoning in which students consider multiples perspectives and assumptions to predict a client’s future. Conditional reasoning is acquired with time and experience. Students can develop the ability to challenge assumptions and consider multiple perspectives using case studies that become increasing complex (Tayyeb, 2013; Townsend et al., 2014).

### **Transformative Learning Theory and Critical Thinking**

In addition to a cognitive processing perspective, two educational theories, transformative learning and critical pedagogy also underpin critical thinking. Transformative learning (Mezirow, 1997) involves changing “frames of reference through critical reflection on the assumptions upon which our interpretations, beliefs, and habits of mind or points of view are based” (p.7). Transformative learning is essential, particularly in healthcare, where future practitioners must experience dissonance to drive their growth past inert knowledge to information, which is actionable, ethical, and equitable. Kegan (2000) expanded upon Mezirow’s definition, suggesting that learning is genuinely transformational only when a shift in epistemology (*how we know*) occurs in addition to gains in behavioral and foundational knowledge. An epistemological shift is best characterized by what Kegan (1994) referred to as fourth order knowing, or self-authorship, roughly equivalent to the highest level of Frenk’s learning hierarchy (Frenk et al., 2010). Fourth order knowing is self-directed and recognizes the fluidity in the ‘truth’ value of knowledge, providing a flexibility for considering multiple viewpoints as valid representations of the world and how people live their daily lives within that world. Case studies are one instructional means of

enhancing fourth order knowing. When carefully constructed and implemented intentionally, case studies both require and promote the metacognitive processes comprising advanced features of thinking and conceptualizing.

### **Critical Pedagogy and Critical Thinking**

Critical pedagogy has similar goals as transformative learning and achieves those through two basic avenues. First, “there is a need for a language of critique, a questioning of presuppositions”, and second, that critical pedagogy “goes beyond critique to elaborate a positive language of human empowerment” (Giroux & Kincheloe, 1992, p.130). In the critical pedagogy paradigm, learning must be meaningful before it becomes critical. Case studies provide a rich context, which imbues meaning to a learning activity. Meaning, however, is not fostered solely through content (*what*) and instructional method (*how*). The perspective taken by the educator, the *why* of teaching, also provides further context and meaning. Pratt (1998) described the intentions, beliefs, and actions associated with five different perspectives of teaching: transmission, apprenticeship, developmental, nurturing, and social reform. The social reform perspective involves educational approaches that aim to build a better society through informed advocacy. Instructional strategies within the social reform perspective include experiential learning activities, debate, and case studies, which require self-reflection and challenging the status quo. When embedded within a social reform perspective of teaching, elements of transformative learning and critical pedagogy can facilitate use of and growth in critical thinking skills to enhance both the therapeutic relationship and client outcomes.

### **Case Studies to Facilitate Critical Thinking**

Cases, whether paper, video, simulated, role-played, or face-to-face serve as learning activities that challenge students’ critical thinking skills. The use of complex ambiguous ill-structured real- world cases with uncertainty and divergent perspectives can lead to multiple possible solutions. Case development is supported by the constructivist, cognitive flexibility and situated cognition theories to promote learning (Jonassen, 1997). Complexity should build over time dependent on the content and context of where students are in their professional program course sequence.

The *what* (SDH) and the *how* (case studies) drive transformational learning, however, the design of instruction and assessment structures impact that learning and must be completed using best practices in education. Content provides clarity and supports enduring learning (Biggs, 2014; Fink, 2013). For case studies to become a transformative curricular learning method, their development must be intentional and saturated with the curricular threshold concept. The initial step in case development includes writing intended learning objectives for the case. Why this case, why now, what foundational knowledge is required, what outcomes for the learner will the case promote? Case study development should adhere to the best practice of beginning with objectives following course practices of backwards design (Wiggins & McTighe, 2005).

Fink (2013) offers guidance here through his taxonomy of significant learning which provides an ideal foundation upon which to design case studies focused on SDH and

the facilitation of critical thinking. Fink's taxonomy of significant learning includes six categories of learning: foundational knowledge; application of knowledge through critical thinking to manage complex issues; integration by connecting ideas, other professions, and experiential learning opportunities; human dimension to gain awareness of self and others to be more effective in interactions; caring by developing values; and learning how to become a self-directed learner. Using this taxonomy to develop curricula, Fink integrates course learning activities, measures student learning from those activities, and connects learning goals and activities across all six tenets of his taxonomy to create the course structure. Fink's taxonomy supports the use of case studies that include the complexities of SDH. The learning process is enriched by the tenets of human dimension, caring, and learning how to approach a case that are not typically explicated when using case studies as a learning tool. Social determinants of health add complexity, uncertainty, and ethical dilemmas to challenge the healthcare professional clinical reasoning process.

Case studies also promote what Wiggins (1998) referred to as educative assessment of learning. Educative assessment enhances student learning through frequent feedback on authentic classroom instructional activities. In contrast to auditive assessment, which functions only to audit student learning retrospectively via previous assignments, educative assessment is forward-looking (Fink, 2013). As such, educative assessment requires students to articulate what they expect to be able to *do* with their new knowledge and skills in ill-defined contexts. Articulation requires critical thinking, trial-and-error strategies, and frequent reflective thought. A written guide to the case, much like a reading or discussion guide, offers questions to help identify what past or new knowledge could apply to the case, to sort through relevant and irrelevant information, to critically think about personal assumptions and beliefs, seek alternative perspectives from clinicians, community, or the evidence, and defend the rationale for decisions (Schell & Schell, 2008; Tomey, 2003). Incorporating SDH cases that are incrementally more challenging, by incorporating household, neighborhood, community and population factors, would more optimally simulate real world scenarios and build student critical thinking skills.

### **Core Case Study Attributes**

Kim and colleagues (2006) and Nilson (2016) offered similar core case attributes when developing cases. These attributes include: 1) case relevancy to the learner with objectives and sequencing the content by learner level; 2) making the case realistic and authentic, with irrelevant material to distract, and multiple layers for discovery of information; 3) information that is engaging using multiple perspectives that may lead to many possible solutions; and 4) challenging through the use of ethical dilemmas and risk to the client, increased difficulty or a series of touch points in a case. A fifth attribute related to the instructor process evaluates the objectives for the case as a tool for student learning. Sheehan and colleagues (2018) offered questions for student feedback to the instructor to decide on the continued use of a case. Choi and Lee (2008) offered a similar model for the instructor to reflect on learner objectives. Additionally, to motivate the learner, ensure that cases are timely, embedded in current events, and focused on healthcare issues (Sayed et al., 2017; Sheehan, Gujarathi,



Jones, & Phillips, 2018). If cases are used to intentionally teach critical thinking, threshold concepts and prepare healthcare professionals, then intentionality is required for introducing and employing this learning strategy (Townsend et al., 2014). Working through the complexity of cases provides the multifaceted context, which promotes fourth order knowing and leads to transformative learning.

Beyond assessment utility and student engagement, cases play a crucial role as catalysts for significant learning by adding problem complexity. Cases offer a narrative providing a rich environment where threshold concepts are contextualized to become transformational. Meyer and Land (2003) referred to a threshold concept as “a portal, opening up a new and previously inaccessible way of thinking about something” (p.1). Fortune and Kennedy-Jones (2014) provided further aspects of threshold concepts, describing these concepts as irreversible and integrative, effecting longstanding changes in learners’ knowledge and behaviors. Threshold concepts can impact mental schemas and transform the ways in which learners think about and experience phenomena within certain contexts (Meyer & Land, 2003). Social determinants of health act as a threshold concept, particularly when situated within cases as learning experiences. Social determinants of health connect issues of health equity and social justice to real implications for health and well-being. When housed in case studies, SDH can thus transform the ways in which students think and reason about applied problems in communities and populations. Again, educators must consider not only the concepts necessary to induce transformative learning, but also pay close attention to the way those concepts are presented, connected, and integrated to ensure a quality educational experience.

## **METHODS**

Authors conducted a qualitative content analysis of all the paper cases used over five semesters in one educational curriculum. These SDH elements were analyzed for how they progressed over time. Healthy People 2020 (<https://www.healthypeople.gov/2020>) was the reference to structure the SDH characteristics coded in each case. Over five semesters, 59 cases presented to students were collected across eight courses in one entry level OT curriculum. To address the question of how SDH, as a threshold concept, were used in case studies to challenge critical thinking, the authors analyzed each case for SDH content using 11 codes and met to reconcile differences (see code list in Table 1). Codes were then summed by case. Descriptive statistics were used to calculate means and standard deviations. Analysis of variance (ANOVA) was used to compare codes by semester. The third semester was a continuation of the second semester courses, so cases from these two semesters were combined. Further analysis of the SDH social category by sub codes noted missing information that could enhance the depth of a case. The purpose of this analysis was to see if cases used SDH as a threshold concept with increasing complexity across the curriculum as a learning enhancement strategy. The internal review board at the university determined that this did not constitute human subjects research.

## RESULTS

Case coding analysis revealed differences in frequency across semesters in SDH content for economic, social, and neighborhood (See Tables 1 and 2). A Bonferroni correction was calculated to account for multiple comparisons ( $.05/11 = p = .004$ ). Additional categories that did not demonstrate differences in frequency were home dwelling and diagnosis. On average, there was one diagnosis statement per case. Cases included, on average, 14 social descriptors, which were the most descriptors of any category. To further explore the social category, authors selected the 10 cases with the largest number of socially coded statements (494) and further subdivided them by the social subcategories offered by Healthy People 2020. Seventy-three percent of the social statements reflected subcategories of family relationships (87/494), social support (171/494), and leisure (103/494) statements.

Additional occupational therapy categories of client factors, activities of daily living (ADL), and goals were coded, and frequency varied across semesters. On average, there was one goal statement and two self-care statements per case. Client factor information was the second most frequent category with an average of 12 statements per case. Missing SDH content from the cases included diversity in gender, identity, race, ethnicity, economic status, faith, LGBTQ identity and relationships, culture, local political environment, national origin, alternative lifestyles (homeless, incarceration), and dysfunctional social support.

Table 1

### *Coding Categories, Definitions, and Means (SD) Across 59 Cases*

Category	Definitions	Mean (SD)
<b>SDH Codes</b>		
Economic	Income, employment, housing, managing household chores	4 (6.7)
Education	Level of education, literacy, access, early childhood & special education	3 (5.6)
Social	Social support, family relationships, leisure	14 (18)
Health Care	Insurance, access, medications, policies	6 (6)
Neighborhood	Community resources, transportation, geographic location, safety	2 (3)
<b>Additional Codes</b>		
Client factors	Related to diagnosis, DME, test results, mental health, physical	12 (10.5)
Diagnosis	Diagnosis, disability	1 (.6)
Biological	Age, gender, race, ethnicity, stress, alcohol & drug use	5 (3.5)
Household dwelling	Any description of in-home environment	2 (4)
ADL	Self-care	2.6 (5)
Goals	An occupational therapy goal is identified	1(2)

*Note.* SDH = Social Determinants of Health; ADL = Activities of Daily Living; DME = Durable Medical Equipment.

Table 2

*Coding by Category, Semester, Mean (SD), and ANOVA Results*

	Semester 1	Semester 2 & 3	Semester 4	Semester 5	ANOVA
<b>SDH Codes</b>					
Economic	1.7 (2.5)	1.9 (3.1)	4.5 (1.3)	11.4 (3.5)	F = 7.79, p = .000*
Education	1.1 (2.8)	3.3 (6.4)	2.5 (4.6)	6.3 (8.3)	F = 2.2, p = .09
Social	3.4 (4.7)	15.5 (21.7)	17.1 (15)	32.2 (20.5)	F = 8.48; p = .000*
Healthcare	3.9 (3.6)	5.5 (6.4)	7.9 (6.6)	8.4 (7)	F = 2.07; p = .11
Neighbor- Hood	.2 (.5)	1.5 (3.1)	2.8 (1.8)	5.6 (4.8)	F = 10.12; p=.000*
<b>Additional Codes</b>					
Household dwelling	.1 (.6)	2.2 (5)	4.5 (4.8)	3.6 (3)	F = 4.69; p = .005
Diagnosis	.9 (.5)	.9 (.5)	1.3 (.8)	.9 (.6)	F = 1.29; p = .28
Biological	4 (1.4)	4 (3.7)	4.8 (2.4)	10.1 (3.7)	F = 13.57; p = .000*
Client factors	3.6 (3.9)	13.6 (7.2)	14.2 (11.7)	23.8 (9.3)	F = 17.6; p = .000*
ADL	.14 (.35)	2.3 (4.6)	6.6 (7.3)	4.1 (4)	F = 6.2; p = .001*
Goals	.3 (.6)	.3 (.6)	2.8 (4)	1 (1.3)	F = 5.13; p = .003*
Total number of cases	22	15	11	11	

Note. ADL = Activities of Daily Living. \*p < .004.

## DISCUSSION

The explicit use of threshold concepts in education is increasing in prevalence (Cousin, 2006). Threshold concepts offer a new way to think that may be unfamiliar yet, once introduced, will be remembered and not ignored. By framing SDH as a threshold concept, these determinants are brought into view as transformative and fundamental to master for the profession of occupational therapy due to the significant impact they have on health and outcomes. Cousin (2006) highlighted three important characteristics of a threshold concept that are relevant here: 1) once a concept is understood, the learner is unlikely to forget the concept; 2) the concept brings hidden connections and relationships into view; and 3) the concept challenges learner assumptions and opinions. Many authors offer guidelines for case development but not intentional case creation for the healthcare professional using learning objectives, nor cases focused around the threshold concept of SDH. The preponderance of client factors found in the cases suggests an emphasis on the medical model and an agenda heavily focused on foundational knowledge. However, if cases are used to promote critical thinking, cases cannot focus only on client factors, as this implies the view of the body as a machine, separated from the phenomenological: the responsibilities, context, and environments in which people live and draw meaning (Mattingly & Fleming, 1994). Social circumstances can impact health prevention, recovery trajectories, and chronicity. Ideally, case-based learning should promote fourth order knowing and encourage learner growth and agency that is discipline-specific (Tayyeb, 2013).

Critical thinking requires learner reflection to stimulate the analysis and evaluation of that thinking. By becoming aware of ones' thinking, thinking is analyzed and altered. Learner reflection is one of three ingredients to active learning and is a key learning strategy used by Fink (2013) in his taxonomy of significant learning. Adding routine reflection of how one views the over-riding complexity of SDH will challenge assumptions and case outcomes, as well as extend the meaning of the learning activity. Additionally, with the mandate to incorporate interdisciplinary training (NASEM, 2016; Accreditation Council for Occupational Therapy Education [ACOTE], 2018), critical thinking extends into identifying interdisciplinary community partners to engage as a team to monitor assumptions and beliefs for those served.

With only one client centered goal on average per case, an opportunity presents itself to include more goals to challenge critical thinking. For example, the head of a household who is prohibited from driving may have a rehabilitation long-term goal of driving to work which may not be realistic in the short term. The learner must analyze loss of occupation from the household viewpoint, consider alternatives, and critically think about personal assumptions and viewpoints about what the loss of autonomy and responsibility means to someone living in an area with no public transportation. Adding a mix of client goals, unattainable distractor goals, household goals, and employer goals would increase the complexity of the case and thus provide students with opportunities for fourth order knowing.

### **Implications for Occupational Therapy Education**

Based on case analysis and the potential as an intentional learning strategy to stimulate critical thinking, other educational curricula are encouraged to design cases with specific attention to the SDH or other threshold concepts that are used for learning. The following guidelines are proposed for case development.

1. Have explicit intended learner outcomes for all cases. Why this case, why now, what learner outcomes will this case promote?
2. Ensure sequenced complexity to some cases across the curriculum.
3. Build reflective prompts and responses about personal assumptions, biases, & health beliefs into courses.
4. Add a critical thinking element: how did the case challenge your thinking?
5. Challenge epistemologies, or 'how we know what we believe to know.'
6. Ensure that all cases are related to client centered goals.
7. Enlist a range of SDH descriptors that realistically alter occupational therapy approaches and outcomes (i.e., no access to transportation, childcare, or flexible time off from work to attend weekly day time occupational therapy outpatient appointments).
8. Embed clients in household, neighborhood, and local community.
9. Add realistic current local events that could impact client and case.
10. Offer sequels to a case with unanticipated outcomes (e.g., poor medication management leading to hospital recidivism, or loss of job, home, family after mild cognitive injury).
11. Ensure inclusion of diversity across curricular cases for gender, identity, race, ethnicity, economic status, faith, LGBTQ identity and relationships,

culture, local political environment, national origin, alternative lifestyles (homeless, incarceration), and dysfunctional social support.

To determine if significant learning is taking place, Fink (2013) suggested evaluation of learning activities along with student learning. Evaluation may include questions related to how knowledge gained will be used in the future as a professional (Tayyeb, 2013; Townsend et al., 2014). Engaging in self-reflection about the impact of SDH is essential to professional development and transformational learning (NASEM, 2016). Authentic cases assist in this growth, as students reflect on situations they will encounter professionally. Authentic cases mirror the process of authentic assessment (Fink, 2013; Wiggins, 1998) by offering ill-defined cases that requiring critical thinking, exploration of the region or communities in which students and clients are embedded to look for solutions, build on foundational knowledge, and use increasingly difficult cases, fostering opportunities for feedback and growth.

### **Study Limitations**

The major limitation for this study is analysis of case studies from only one curriculum. Perhaps other curricula already have integrated progressively complex SDH into cases as a means to foster critical thinking and transform learning. Identifying SDH as a threshold concept elevates the attention given across courses to integrate a threshold concept with intentionality and purpose. Social determinants of health are one threshold concept, but there are many others. Each educational program may identify their own threshold concepts to emphasize in curriculum beyond SDH. Due to the nature of SDH and asking students to reflect on personal SDH, faculty should offer safe space to students to reflect and consider this threshold concept.

### **Future Directions**

Future directions are to offer faculty workshops for intentionally enhancing the complexity of cases across curriculum that simulate potential situations that will be encountered professionally and to evaluate the progression of critical thinking throughout curriculum, particularly critical thinking promoted through case studies.

### **CONCLUSION**

The skill to critique 'how we know what we know' and choose among many valid solutions is a hallmark of a professional who thinks well beyond a purely technical level. Using the threshold concept of SDH is a means to transform and facilitate development of critical thinking skills, particularly when taught using a case study instructional strategy. Faculty can identify their own threshold concepts and explore the use of case studies in their curriculum as a means of explicitly guiding students to develop critical thinking skills. More case studies or more SDH content is not what is needed in occupational therapy curricula; rather, careful integration of SDH into case studies and other critique-evoking teaching methods create the conditions for transformative learning and the development of students as fourth order knowers able to reason through complex problems. Dunning (1973) presciently remarked that "if occupational therapy is more than a medical technology then it has to function as a spokesman for the individual and as an agent of societal change" (p.21). Intentional instructional

approaches can assist educational programs to develop the professional change agents needed to serve communities and populations with a larger goal of health equity.

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