Eastern Kentucky University
Encompass

Pedagogicon Conference Proceedings 2020

Tacit to Explicit Knowledge Transfer in a University Health Care Program: Use of Student-Professor and Professor-Professor Collaboration

Geela Spira
Eastern Kentucky University, geela.spira@eku.edu

Allen S. Keener
Eastern Kentucky University, askeener@gmail.com

Follow this and additional works at: https://encompass.eku.edu/pedagogicon

 Part of the Educational Methods Commons, Occupational Therapy Commons, and the Scholarship of Teaching and Learning Commons

Spira, Geela and Keener, Allen S., "Tacit to Explicit Knowledge Transfer in a University Health Care Program: Use of Student-Professor and Professor-Professor Collaboration" (2021). *Pedagogicon Conference Proceedings*. 1.
https://encompass.eku.edu/pedagogicon/2020/reciprocity/1

This Event is brought to you for free and open access by the Conferences and Events at Encompass. It has been accepted for inclusion in Pedagogicon Conference Proceedings by an authorized administrator of Encompass. For more information, please contact Linda.Sizemore@eku.edu.

Author Biography

Geela Spira, PhD, OTR/L: Geela Spira is an Associate Professor at Eastern Kentucky University. Her background includes physical rehabilitation, neuro-restorative care, burn care, and pediatrics over settings in the USA & Israel. Her current areas of research include global health, sensory processing and sleep, and use of visual imagery/ Photovoice in the classroom.

Allen Keener, OTD, MS, OTR/L, ATP: Allen Keener is an Associate Professor at Eastern Kentucky University. He teaches courses in healthcare practice, assistive technology, and occupation in diverse contexts. His experience includes acute care, inpatient rehabilitation, home health, outpatient, and mental health. Research interests include technology to enhance occupation, occupation-based practice, and innovative teaching methods.

This event is available at Encompass: https://encompass.eku.edu/pedagogicon/2020/reciprocity/1

2020 Pedagogicon Proceedings

Tacit to Explicit Knowledge Transfer in a University Health Care Program: Use of Student-Professor and Professor-Professor Collaboration

Geela Spira and Allen Keener
Eastern Kentucky University

Student feedback indicated difficulty applying Occupational Therapy values such as "participation in meaningful occupations" into clinical interventions. Two instructors of a components-based course and a theory course collaborated to link practical OT interventions to conceptual OT models. Use of a model for transfer of tacit knowledge was utilized. Each instructor kept a reflective diary. An iterative process for a semester attempted to transfer learned explicit knowledge into an integrated intuitive 'art of the therapy' which incorporated Occupational Science core concepts. Worksheets were developed to make the pathway more explicit. By semester's end, students completed a comprehensive plan for client care.

Introduction

Qualities required for student assimilation of knowledge are debated and reviewed in order to achieve an optimal and effective approach. Intradepartmental collaborative instruction has noted benefits. Student-teacher collaboration has benefits as well. Curriculum design may also ensure student assimilation of core concepts threaded throughout courses in a health care discipline (Turpin et al., 2012). Situational differences and needs may determine which of the designs will be actualized in a given classroom. As well, the process of knowledge transfer of tacit information into explicit translation and use by students is central to student integration of taught knowledge. This paper will review the use of student-teacher collaboration, curriculum design, and the transfer of tacit knowledge in an iterative process over a semester in order to promote the concept of occupation and its integration at all conceptual levels in a graudate level occupational therapy curriculum.

Overview

Establishing a strong relationship between theory and practice is the basis of healthcare education across all disciplines, including occupational therapy.

According to Battistutti and Bork (2017), knowledge acquisition involves both a social process and a cognitive process. For acquiring knowledge through social processes, a variety of methods may be utilized to connect theoretical principles into practical use for students, including the use of student-professor collaboration, professor-professor collaboration, or a content-based collaboration which transitions and aligns information to enhance the learning environment and curricula. When a departmental curriculum is taught without such collaboration and alignment between courses regarding course material, methods and general flow, students may complain and feel as though their voices are not heard (Mihans et al., 2008).

In order to address student frustration, it is recommended to explore options that will include addressing the student perspective in order to inform both student-professor and inter-professor collaboration. Use of student satisfaction and feedback may be beneficial for modification of course content in order to meet student needs and projected outcomes in clinical settings. Teaching concepts of health care in an intentional manner to create a pathway which promotes internalization of explicitly taught concepts may promote greater adoption and integration by students when there is a clear explicit pathway in which to apply them (Stube & Jedicka, 2007). One noted barrier for students when attempting to actualize implicit concepts in a tangible manner is that instructors may not be aware of how to make tacit knowledge explicit (Battistutti & Bork, 2017).

Student-Teacher Collaboration

One worthy direction to gain the best possible input on how well a course is implemented is to ask those who are taking it. Oftentimes, professors tend to teach in isolation, formulating their own curricula and content without looking for other's input (Lester & Evans, 2008). This can be classified as "pedagogical solitude" (Hayward et al., 2018). While this independence can be useful, it yields itself to the possibility of a one-track-mind development of material that will ultimately not work for all students. Establishing a balance between the independent input from an individual professor's development of a course, along with inputs of others, can bring course content into a more cohesive outcome. Such a collaboration can occur between the student and the professor, as students participate in the course and experience the full curriculum of their studies.

Viewing the contribution of student input according to the Model of Self-determination Theory, students have three basic needs to optimize their learning; autonomy, competence, and relevance (Hayward et al., 2018). Autonomy may be

achieved through student perception that they have choices within their academic program, and that they are not being strictly controlled. Competence relates to both a student's ability to grasp the material, as well as apply it in a way that is personally meaningful to them. Finally, relevance is the ability for the student to conceive how the information they are taking in may be applied in practice. According to the Self-determination Theory, when these three needs are met, students are more likely to be engaged in their learning and therefore optimize their knowledge (Hayward et al., 2018; Ryan & Deci, 2000).

Through facilitating a collaborative relationship between professor and student, all involved can benefit. Collaborations include types of strategies such as asking for honest student feedback and then implementing it. The environment becomes able to transform to one that fosters motivation, relevance, and active learning. This in turn helps with the implementation of information into real life scenarios. This transition from concept to practical usage is specifically important within the health sciences, with the focus being on implementing theory into hands-on practice (Torre et al., 2017).

Professor-Professor Collaboration

As mentioned, professors may fall into pedagogical solitude. Professors who engage in reflection often learn from their experiences, promoting a professional development that is meaningful and relevant (Noormohammadi, 2014). This type of reflection may be enhanced by peer collaboration with other faculty who understand the inner workings of teaching. Fellow professors provide a perspective that can be very particularly valuable as they are aware of program demands, and such cooperation may be addressed through interdepartmental collaboration between professors.

According to Briggs (2007), it is important for professors to collaborate and agree on what study of a major should result in, and therefore create a curriculum plan that is seamless and accomplishes those results. Thus, intradepartmental collaboration is vital for curriculum cohesiveness across courses, especially in health care professional programs. Coordinating and collaborating across courses is especially important in health care, as the designed curriculum is in the form of a hierarchy that builds upon previously learned fundamentals. While in theory, this could be done individually with an understanding of the course progression, it is shown to be especially effective when decisions and plans are formulated by departmental faculty as a whole, rather than by an individual educator (Briggs, 2007).

Faculty, especially within a department, is often classified as a team. According to Burrell et al., team- based curriculum planning happens when a group of staff work together as a team and develop or redesign a department curriculum of a particular discipline (2015). This practice is commonplace in lower-level education, but there is little literature regarding its implementation in higher level education. Most collaboration amongst professors is in regards to research projects they may be working on (Voogt et. al, 2011). The shift to using collaborative skills in regards to curriculum development would ultimately be beneficial to students and to the department as a whole.

Collaborative Curriculum Model for Content Alignment

The Collaborative Curriculum Design Model may guide an integrative endeavor to coordinate content between courses (Pukkila et al., 2014). According to Goode et al. (2018), "collaborative environments… can help to break down disciplinary barriers." This is especially important in an academic environment, where professors tend to be the leading voice and are considered the 'experts. Due to unintentional intimidation students may feel that their input is less valued (Mihans et al., 2008). Therefore, a collaborative environment would promote a beneficial curriculum design to break down perceived student barriers. This will allow for student feedback to be implemented effectively into an overall departmental curriculum design for greater cohesiveness.

Knowledge Transfer from Theory to Practice

This project focused primarily on the collaboration of students and professors in order to yield a more seamless transition of understanding theoretical occupational therapy concepts and then applying them into occupational therapy practice. A common issue noted for occupational therapy students is being able to relate theoretical knowledge into a clinical setting for intervention (Johansson & Bjorklund, 2005). Skill generalization is important as new graduates go out into the field and begin to develop their own personal style of implementing therapy. The undergraduate study program of occupational science noted in this project assists students to acquire fundamental knowledge of the concept of occupation and its importance to the profession. However, when faced with planning actual occupation- based interventions, some students found it difficult to relate their practical interventions to theory. One such transitional skill would be to provide examples of choosing theoretical knowledge and applying it into simulated practice scenarios, such as clinical case studies. Case application provides students with a real- life opportunity to begin making connections, and the opportunity

to ask questions of their professors in real time, to help further develop their skills. Students are traditionally expected to know how to transition and connect the concepts, without a roadmap or guidance, however (Velde et al., 2006). Instructors may not be aware that application of knowledge that is commonly used in the profession, and is known to them as second nature, is as yet, unknown to students. The process of transferring tacit knowledge to students for explicit use was integral to this project, and will be further explored.

Tacit Knowledge Transfer

Tacit knowledge can be described as knowing 'how' rather than knowing 'that' (Chugh, 2018, p.1). Universities are a formal means in which knowledge is taught to students. While explicit knowledge can be codified through checklists or documentation, tacit knowledge is idiosyncratic as it incorporates an individual's life experience (Smith et al., 2007). Although difficult, it is possible to convert intangible tacit knowledge into tangible explicit knowledge for use (Syed-Ikhsan & Rowland, 2004).

When teaching subjects related to health care, making personal knowledge available for reuse in clinical settings is of critical importance. Health care students are expected to transfer and transform explicit knowledge into a type of intuitive knowledge, the art of healing. Yet, few studies exist in the literature that describe such a process for such a knowledge transformation of information, and literature is even sparser regarding the process of tacit knowledge transfer for teaching health care professions (Chugh, 2017, 2018; Hojabri, 2013; Smith et al., 2007).

Battistutti and Bork (2017) proposed a four- step process to make tacit knowledge more explicit. These steps include strategic planning, initial conceptual model building via visual knowledge representation, a feedback stage, and a final model building stage with an aim of efficient application and ease of use. Other studies reviewed barriers and enablers of knowledge transfer of tangible knowledge for 'intangible' reuse. Barriers included time constraints to invest in the learning strategy and technology needs. Enabling factors included open communication and cultivation of a knowledge sharing culture (Hojabri et al., 2012; Krishnagiri et al., 2017).

Application of content from the literature review to an actual translation of the process utilized in the classroom is reviewed in this article.

Institution/Program Context

This project was implemented at Eastern Kentucky University, specifically within the Department of Occupational Therapy and Occupational Science. Students in the courses involved were first year Master's level students. The courses include a theory-based course, titled "OBP: Application of Fundamentals" (TC) and an occupation- based practical skills course titled "OBP: Health Care Practice 1" (CS).

Assessment/ Procedures

The project of collaboration between the component skills course of Occupational Therapy in the first year of the Master's program of health sciences studies in a University and the theoretical foundations course of the same year began after receiving consistent student feedback in yearly evaluations. Students reported proficiency in both courses, but were unable to link the two together. Such an incorporation of occupational outcomes during implementation of concrete skills remain one of the unique aspects of occupational therapy. Hooper et al. (2014) address how interprofessional topics such as kinesiology or neuroscience must intersect with the concept of occupation in order to be part of occupational therapy's distinct knowledge base. Student discussion at the end of year theory course (TC) summary noted that use of case studies from the component skills course (CS) would be preferable to separate case studies for each course. This consistent feedback began the collaborative processes in this project.

Stage 1- Strategic Planning

With motivation provided from the yearly student feedback comments, an initial meeting was held between a course instructor of each type of course- one professor from the theory course and one professor of the component skills course. The impetus originated from the theory course instructor, as there was more course time allotted to align course learning objectives to clinical practice. Initial joint plans were to share case study examples from the component skills course to the theory course. It soon became clear that the CS course instructor also noted the difficulty students were having linking concepts into that course. It was decided to add CS instructor input into the incorporation of CS content for manipulation and analysis into the TC course.

The first strategy was to categorize the different approaches taken to teach materials in each course. Bottom-up components in occupational therapy are considered to focus on body impairments and body structure, whereas top-down approaches are said to consider the *meaning* of occupation and the *purpose* of

the occupation to one's life (Brown & Chien, 2010). The professors noted that a 'top-down' approach was used by the TC course and the use of a 'bottom-up' approach by the CS course. The initial challenge was how to link the approaches.

The scope of this project was initially unplanned. It evolved as progress unfolded, but not enough progress was initially made to meet the goal of competent and confident linking of bottom-up with top-down approaches. The need for bi-directionality in the project became apparent. Several strategies were used. The TC course sent materials to the CS course for incorporation. Both instructors were making and recording observations of the process. Within the first month, the project duly changed to both instructors actively participating in course instruction for the linking between the top-down and bottom-up approaches, both instructors began to keep reflective journals of the process, weekly meetings were instituted, and plans for changes to the TC were adjusted and incorporated in an iterative process throughout the semester. Thus, in retrospect, the first stage of the knowledge acquisition and knowledge conversion model, strategic planning, by Battistutti and Bork (2017), was adopted.

Stage 2- Initial Model Building

In the second stage of the knowledge conversion model, tacit, or implicit knowledge is converted to explicit knowledge is to build an initial model. In this stage, personal and unformalized tacit knowledge is converted to visual models, typically with labeled wording. The knowledge that is designed to be transferred is defined and takes shape (Battistutti & Bork, 2017).

In this project, as gaps became apparent in the ability to gather relevant information connected to occupation, to link disparate pieces into a meaningful whole, or find intrinsic value of the activity to the client in the case study, the visual medium was created, similar to the process in the knowledge conversion model. The instructors were then able to mediate a linking process with the class, with a measure of success. Yet students were unable to repeat the process on their own. At this point, the use of cognitive acquisition took the forefront of program development. A nine-stage flowchart was designed with three levels. Each level had both bottom-up and top-down components embedded in it. The first level of the graphic focused on client diagnosis, common symptoms for all clients with that diagnosis, and included the client narrative of their goals for intervention. The second level of the graphic reviewed the functional implications of the diagnosis, whether illness or injury. This level included the activity that the client was now unable to perform and placed that functional activity with the

occupational therapy classification domains and subdomains of the Occupational Therapy Practice Framework document (AOTA, 2014). This second level of the flowchart also included practical limitations to performance of that activity, whether from the client's abilities or from environmental barriers. The third level in the graphic (Spira & Keener, 2020) related to the practical situation of identifying clinical interventions based on the previous two levels of information. After establishing interventions, the student was then to identify the meaning of achieving the noted activity, thus achieving a full circle link from component skill issues and interventions to occupational outcomes of meaning and purpose. The graphic form required students to complete all aspects of clinical reasoning and made explicit how previous foundational information was built upon to achieve application to a specific client situation with uniquely tailored interventions to meet that client's occupational identity (Hooper et al., 2017; Krishnagiri et al., 2017; Spira & Keener, 2020).

With the graphics in place, a shared language, and a clear identification of the required items for knowledge acquisition, the project then turned to the goal of transfer of explicit knowledge. According to Battistutti and Bork (2017), the stage of explicit knowledge allows occurrence of a knowledge generation cycle. Using shared concepts, the students were able to use course knowledge and apply it to new case studies and to unknown situations. Three main concepts were required of the students in order to achieve this were- a. core occupational science concepts, also called occupational outcomes from the TC course, b. fundamental knowledge of health conditions from the CS course, and c. application of the visual graphic to apply the knowledge in an organized and complete manner, where the linking process was converted into an explicit pathway for students to follow. At the end of this stage, students reported feeling competent in using the flowchart in the TC course. Additionally, it was noted that students began to use core occupational concepts in their CS course (Keener, personal communication, September 30, 2019).

Stage 3- Feedback to the Model

A third stage in the knowledge acquisition and knowledge transfer model is use of feedback to modify the model. In this stage knowledge transfer remains on the explicit level. For the project, one further piece of creativity and flexibility in planning interventions was useful to students. They were able to apply flexibility in intervention planning both in the graphic worksheet and in intervention planning, with identifying alternative options where they may previously have

gotten stuck in analyzing a situation. The CS instructor has planned to incorporate more than one possible option for interventions in the presented cases in the next semester. This would be an example of feedback being used to modify application of the model. At the end of the semester, students were using the flowchart competently to plan interventions. However, upon deeper examination, students still reported difficulty eliciting useful information from interviews and assessments, both narrative and physical examinations, and difficulty prioritizing the information. They were able to identify supplied information to reach meaningful conclusions, but reported difficulty in extracting useful information on their own.

To address this issue of extracting targeted and useful information, the TC instructor changed the approach to bottom-up in the theory course during the semester. Using known principles for biomechanical approaches in handwriting, and neuro-developmental approaches in neuro-restorative interventions, the approaches began with clinical observations of students' handwriting and posture, to make meaningful observations of hand dominance, and of deficits in muscle groups in hand musculature. These practical observations were then moved up to practical limitations in pencil grasp and writing fatigue, or how body positioning can affect handwriting quality. Students then identified larger life issues that might be affected by such difficulties or barriers. Seeing the linking process work in a bi-directional manner, and having the principles applied to their colleagues, rather than case studies, caused a shift in the students. The class entered a state of 'flow' where the social and cognitive aspects of knowledge transfer combined to incorporate emotion, motivations and cognition on a methodological and theoretical level, and synthesis and application of learned concepts became explicit shared class knowledge (Battistutti & Bork, 2017; Meyer & Turner, 2006).

Stage 4-Final Model Building

The final stage of the knowledge acquisition and conversion model is the final building of the model. This fourth stage moves explicit knowledge back into an internalized tacit state of knowledge by the student. With increased and refined models for manipulating explicit knowledge, students transform their explicit knowledge into individualized and personalized ways of knowing (Battistutti & Bork, 2017). This level is not expected to be reached within the context of one or two courses, and possibly may not even be reached at the completion of their studies. Rather, the goal of the TC and the CS courses was to impart a foundation

when participating in the student fieldwork portion of their studies, and in beginning occupational therapy positions.

Discussion/Considerations/Implications

Student- Professor Collaboration

Students are often expected to independently know how to connect concepts to actual practice post-graduation. Instructors who successfully apply theoretical concepts without conscious effort may not be aware that students are unable to convert such learned knowledge without a pathway or guidance (Velde et al., 2006). Student input via student feedback for this process was integral to the project from inception through to final student course evaluation. Hayward et al. noted that students have three basic learning needs of autonomy, competence and relevance (2018). Autonomy in perception of having choice in the two courses was accomplished when student feedback addressed the collaboration project between the TC & CS courses, and how students envisioned the collaboration continuing. Student feedback in the course evaluations supported that students perceived being heard and felt empowered to continue with suggestions for future incorporation of the collaboration including (Spira, personal communication, December 4, 2019).

> "The only thing that could improve this course is if Dr S. & Dr K. are able to further their collaboration to help connect content from course [TC] and course [CS]."
>
> "This is something that I hope continues in the years to follow because it benefited our class immensely."

Competence of student perception in their ability to learn and apply the content was achieved through use of the occupational flowchart to achieve occupational outcomes that related bottom-up and top-down concepts. Student feedback in the course evaluations supported this statement, with feedback including:

> "Dr S. and Dr K. collaborated and created a nine- chart table. This table was so beneficial in taking a case and determining appropriate interventions that relate to key OS concepts."
>
> "The incorporation of the CS course with this [TC] course allowed for application of the knowledge. This [flowchart] outline provided the best way for me to learn personally."

Student perception of relevance is a central desired outcome in student- professor collaboration. Knowledge that explicit skills may be used for clinical practice in a flexible application would have particular relevance to students in a health science program. Student feedback in the course evaluations supported that students perceived a link between theory and practice, including:

> *"The relationship between the [TC] course and this course- I was able to see clearly how OT [occupational therapy] comes together with practice and theory".*
>
> *"This provided the opportunity to apply the knowledge to 'real life situations'."*
>
> *This was "helpful to craft a bigger picture."*
>
> *Dr S. took a class about theory and made it apply directly to occupational therapy and connected it with our other courses."*
>
> *The [CS] and [TC courses] overlap was the best thing to happen this semester and I loved it!!"*

When student needs of autonomy, competence, and relevance are met, the literature supports the findings of this project, that students are more likely to have an optimal learning experience (Hayward et al., 2018; Ryan & Deci, 2020). Professor-professor intradepartmental collaboration may also affect student learning and knowledge transfer from tacit to explicit use.

Professor- Professor Collaboration

The issue of pedagogical solitude is well known throughout academia. Courses may be taught without intentional threading of concepts or terminology in a unified manner across the department courses. Rather, professors may develop their individual courses and teach them across time, in a silo fashion (Noormohammadi, 2014). Peer collaboration with other faculty can provide a broader perspective and additional understandings of the demands of the greater departmental program. The described program collaboration of the TC and CS courses began as a light collaboration with coordination of case studies. However, the structure of use of reflective journals and weekly meetings revealed that students in both courses were undergoing an assimilation process that necessitated a more structured and focused approach by the collaborating professors. It became apparent that the initial conception of a random, general,

unfocused approach was insufficient to meet student needs. In response, the professor-professor collaboration became more intentional and purposeful, but the pathway was not yet clear in the beginning of the project. An iterative process of 'student outcomes- professor- professor review and planning- execution of the weekly agenda' occurred in a cyclical fashion throughout the semester. The final third of the semester achieved clarity for program content, tools and instructional materials, and needed outcomes.

Professor reflections from their reflective journals indicated initial problems and then increasing clarity as the process unfolded. Initial difficulties noted by the professors included:

> Dr S.: "We filled in the occupational profile template to see how they [students] could move from this case study to meaningful occupation as appropriate to COPD. The [CS] case study had a sentence about SOB leading to decreased QOL, but no middle level occupation. It was too big of a jump with no middle link."
>
> "They [students] were not able to say what things they observed in the interview that led to establishing the goals that were established. Why not??"
>
> "A student came into the planning meeting [of Dr S. & Dr K] and asked if her long term goals were relevant to her occupational goals. She was stuck in that she could do either separate but not together. She couldn't link."
>
> Dr K.: "I instructed the class to … write one long term goal and one short term goal for 'Mabel'. Several wrote goals for dressing. I asked why does Mable need to complete dressing? Several students responded that she needed to go back home. So, a little progress there…"

Progress was also recorded in journals by the two professors:

> Dr S.: "I invited Dr K. into my class. The students loved the dual interaction and to see their classes coalescing. They [students] said that they had trouble winnowing down generalities to specifics in that client's actual … case. We discussed having a new paradigm of combining bottom-up with top-down and that we can begin at either end as long as we work through to reach the other end."

"They had to go back and forth between practical observations with hands-on, and relating the theory to the actual client condition. Here they had a click and the class went into 'flow'."

Dr K.: "We watched a video.. the client was wearing shoes with Velcro closures and he stated he could don/doff those independently but he did not like them. So, I asked the class- is he independent? After a second a couple of students hesitantly said 'no, … that he did not like that kind of shoe so we needed to help him [with] the ones he wanted to wear because those meant something to him'! Hooray!"

Interplay of Tacit to Explicit Knowledge Transfer

Combining the rules and teachings of occupational therapy with the 'art of therapy' requires both tacit knowledge and explicit knowledge. According to the Life Cycle model by Battistutti and Bork (2017), varying stages of knowledge acquisition and knowledge transfer utilize predominantly one or the other types of knowledge. Occupational therapy students and recent graduates reported feeling unprepared to intentionally target needed interventions and choose skills. This collaborative project detailed a collaborative effort to align the different types of course knowledge required in a fundamentals of theory course and a component skills course, based on the stage of knowledge transfer required (Hodgetts et al., 2007). This collaboration in an intradepartmental program began in a loosely structured fashion without specifically envisioning desired outcomes. Initially, the outcome was solely to incorporate case studies from the CS course to the TC course, as noted in student feedback. The reasons behind the students' request to incorporate case studies from the CS course into the TC course were as yet unknown. Thus, the first stage of planning for knowledge acquisition, which evolved throughout the first third of the semester, explored the needs and barriers required for tacit knowledge acquisition.

Student interest and need dictated that the process continue on and become more explicit in stage two, the model building stage. As the professors gained increased awareness that they were using tacit knowledge, they also realized that the pathway for students to apply learned knowledge was not explicit to them and therefore unusable. The need for building an initial model using explicit language and pathways was the driving force for the next third of the semester. In this second stage, creation of tools and materials took shape. Experimentation with application was practiced by the students. As students began to understand that

there was a structure and pathway, they began to try to apply the tools, such as the flowsheet, and began to challenge the professors with questions.

The final third of the semester was spent with feedback on the knowledge transfer process, and subsequent refinement, in an iterative manner. Each class session would nurture a new insight, which was then discussed in the professor-professor meeting, with an adjustment made. In class, the students would try out the newest changes and provide feedback on what was still unclear or not explicit enough for them to travel a full pathway from client case study through to occupational outcomes related to real life situations. When presented with actual classroom situations such as students' hand grip dominance and asked to apply principles in bi-lateral directions, both bottom-up and top-down, students demonstrated competence in performing analyses and constructing occupational performance goals and outcomes. This stage remained at the level of explicit knowledge, but with refinement.

The final fourth and final stage of knowledge transfer was for student internalization of the explicit knowledge to form a personally constructed approach to occupational therapy planning. Each occupational therapy student is expected to build a dynamic internal tacit model of health care intervention upon graduation or as they assimilate into the professional workplace, ever-changing as new information provides further feedback for further refinement. This internal process may be called the 'art of therapy'. While based on common professional concepts and explicit language, each student therapist will eventually create their own unique personalized individual model as to how one 'knows' and 'applies' what they know about occupational therapy and occupational therapy intervention planning and execution (Hooper et al., 2014).

It is hoped that the process of acquiring and transferring knowledge through both tacit and explicit processes, in a bottom-up and top-down directional manner will facilitate all four stages of model building for knowledge acquisition and transfer (Battistutti & Bork, 2017; Chugh, 2017). Intentional use of tacit to explicit knowledge transfer, in a collaborative process between students and co-professors, allowed students to create a pathway. The pathway made explicit a framework and structure to apply concepts taught in two distinct but related courses, into a cohesive unified whole, for use as fieldwork students and future clinicians.

References

AOTA. (2014). Occupational Therapy Practice Framework: Domain & Process 3rd ed. American *Journal of Occupational Therapy*, *68*(Suppl. 1), S1–S48.

Battistutti, O.C. & Bork, D. (2017). Tacit to explicit knowledge conversion. *Cognitive Processing*, *18*, 461-477. https://doi.org/10.1007/s10339-017-0825-6

Briggs, C. L. (2007). Curriculum collaboration: A key to continuous program renewal. *Journal of Higher Education*, *78*(6), 676–711. https://doi.org/10.1353/jhe.2007.0036

Brown, T. & Chien, C.-W. (2010). Top-down or bottom-up occupational therapy assessment: Which way do we go? *British Journal of Occupational Therapy*, *62*(9), 95.

Burrell, A. R., Cavanagh, M., Young, S., & Carter, H. (2015). Team-based curriculum design as an agent of change. *Teaching in Higher Education*, *20*(8), 753–766. https://doi.org/10.1080/13562517.2015.1085856

Chugh, R. (2017). Barriers and enablers of tacit knowledge transfer in Australian higher education institutions. *International Journal of Education and Learning Systems*, *2*(5), 272-276.

Chugh, R. (2018). Tacit knowledge transfer in Australian universities: Exploring the barriers and enablers. *MATEC Web of Conferences*, 210, 04054. https://doi.org/10.1051/matecconf/201821004054

Goode, C. A., Hegarty, B., & Levy, C. (2018). Collaborative curriculum design and the impact on organisational culture. *TechTrends: Linking Research & Practice to Improve Learning*, *62*(4), 393-402. https://doi.org/10.1007/s11528-018-0268-7

Hayward, L., Ventura, S., Schuldt, H., & Donlan, P. (2018). Student pedagogical teams: Students as course consultants engaged in process of teaching and learning. *College Teaching*, *66*(1), 37–47. https://doi.org/10.1080/87567555.2017.1405904

Hodgetts, S., Hollis, V., Triska, O., Dennis, S., Madill, H., & Taylor, E. (2007). Occupational therapy students' and graduates' satisfaction with professional education and preparedness for practice. *Canadian Journal of Occupational Therapy*, *74*(3), 148–160. https://doi.org/10.1177/000841740707400303

Hojabri, R. (2013). Tacit knowledge sharing in health industry: Influences of personal, organizational, and social factors. *East Asian Journal of Business Management*, *3*, 29–35.

Hojabri, R., Borousan, E., & Manafi, M. (2012). Impact of using telemedicine on knowledge management in healthcare organizations: A case study. *African Journal of Business Management*, *6*(4), 1604–1613.

Hooper, B., Krishnagiri, S., Price, M. P., Bilics, A. R., Taff, S. D., & Mitcham, M. D. (2014). Value and challenges of research on health professions' core subjects in education. *Journal of Allied Health*, *43*(4), 7.

Hooper, B., Krishnagiri, S., Price, P., Taff, S. D., & Bilics, A. (2017). Curriculum-level strategies that U.S. occupational therapy programs use to address occupation: A qualitative study. *American Journal of Occupational Therapy*, *72*(1), 7201205040p1. https://doi.org/10.5014/ajot.2018.024190

Johansson, A., & Bjorklund, A. (2005). Uniting theory and practice in occupational therapy students' clinical examinations: A pilot study. *Practice Development in Health Care*, *4*(2), 96–107. https://doi.org/10.1002/pdh.42

Krishnagiri, S., Hooper, B., Price, P., Taff, S. D., & Bilics, A. (2017). Explicit or hidden? Exploring how occupation is taught in occupational therapy curricula in the United States. *American Journal of Occupational Therapy*, *71*(2), 7102230020p1. https://doi.org/10.5014/ajot.2017.024174

Lester, J. N. & Evans, K. R. (2008). Instructors' experiences of collaboratively teaching: Building something bigger. *International Journal of Teaching and Learning in Higher Education*, *20*(3), 373-382.

Mihans, R., Long, D., & Felten, P. (2008). Power and expertise: Student-faculty collaboration in course design and the scholarship of teaching and learning. *International Journal for the Scholarship of Teaching and Learning*, *2*(2), 1-9.

Meyer, D. K., & Turner, J. C. (2006). Re-conceptualizing emotion and motivation to learn in classroom contexts. *Educational Psychology Review*, *18*(4), 377–390.

Noormohammadi, S. (2014). Teacher reflection and its relation to teacher efficacy and autonomy. *Procedia-Social and Behavioral Sciences*, *98*, 1380–9. https://doi.org/10.1016/j.sbspro.2014.03.556

Pukkila, P., DeCosmo, J., Swick, D.C., & Arnold, M.S. (2014). How to engage in collaborative curriculum design to foster undergraduate inquiry and research in all disciplines. In L. Ainsworth (Ed.), *Rigorous curriculum design: How to create curricular units of study that align standards, instruction, and assessment*. Houghton Mifflin Harcourt.

Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, *55*, 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, *6*1. https://doi.org/10.1016/j.cedpsych.2020.101860

Smith, H. A., McKeen, J. D., & Singh, S. (2007). Tacit knowledge transfer: Making it happen. *Journal of Information Science & Technology*, *4*(2), 23–44.

Spira, G. & Keener, A. (2020, September 15-19). EBP: Demonstrating the value of Occupational Therapy [Conference session]. Kentucky Occupational Therapy Association, Richmond, KY, United States.

Stube, J. E., & Jedicka, J. S. (2007). The acquisition and integration of evidence-based practice concepts by occupational therapy students. *American Journal of Occupational Therapy*, *61*, 53-61.

Syed-Ikhsan, S. & Rowland, F. (2004). Knowledge management in a public organization: A study on the relationship between organizational elements and the performance of knowledge transfer. *Journal of Knowledge Management*, *8*(2), 95-111. https://doi.org/10.1108/13673270410529145

Torre, E.M., Agasisti, T., & Perez-Esparrells, C. (2017). The relevance of knowledge transfer for universities' efficiency scores: an empirical approximation on the Spanish public higher education system. *Research Evaluation*, *26*(3), 211– 229, https://doi.org/10.1093/reseval/rvx022

Turpin, M. J., Rodger, S., & Hall, A. R. (2012). Occupational therapy students' perceptions of occupational therapy: Student perceptions of occupational therapy. *Australian Occupational Therapy Journal*, *59*(5), 367–374. https://doi.org/10.1111/j.1440-1630.2011.00988.x

Velde, B. P., Wittman, P. P., & Vos, P. (2006). Development of critical thinking in occupational therapy students. *Occupational Therapy International*, *13*(1), 49–60. https://doi.org/10.1002/oti.20

Voogt, J., H. Westbroek, A. Handelzalts, A. Walraven, S. McKenney, J. Pieters, & B. de Vries. (2011). Teacher learning in collaborative curriculum design. *Teaching and Teacher Education*, *27*, 1235–1244.