Teacher’s Guide
for the Physiotherapy Master’s Program

University of Ottawa

December 2018
Introduction

For who?
The teacher’s guide for the Physiotherapy Master’s Program is intended for program professors, sessional lecturers (part-time professors) and supervisors. From it follows a guide for students.

What and why?
This guide includes a description of the curriculum of the program. The educational foundations and foundations for clinical practice that have been used to develop the pedagogical principles are described in detail to support professors and supervisors in understanding and applying these principles. The values of the program are also defined in this guide, as they give direction to the attitudes and skills that are expected within the program. Training objectives (expected qualities) are also listed, as professors must develop their course plan and content as well as choose the pedagogical and evaluative methods of their course aiming to achieve them.

How?
The curriculum that follows from the pedagogical principles is then explained as well as the teaching methods. The description of each of these methods and several tools is intended to support professors so that they can apply the principles and values of the program.
Vision, Mission and Purpose of the Physiotherapy Program

The vision of the Physiotherapy Program is to be recognized for its leadership in providing quality French-language services and care for Francophone minority communities.

Our historic mission is to “train bilingual physiotherapy professionals able to serve the needs of the Francophone population of Ontario and other Francophone communities in Canada in the bilingual and multicultural context of the country, and to promote a high level of excellence in research and teaching activities in rehabilitation. (University of Ottawa, n.d.)

We want to provide a rewarding, inclusive and equitable training program and environment that will allow our graduates to practice their profession competently with diverse clienteles. One element that is unique to our mission is the ability of our graduates to provide quality services to francophone minority populations in the Canadian context.

The global objectives of the training program consist of:

- Train physiotherapists demonstrating essential skills for entry into independent practice (related to the Essential Skills Profile for Physiotherapists in Canada, 2009). Graduates of our program demonstrate the knowledge, skills and attitudes required to act as front-line professionals for children, adults and seniors in the cardiorespiratory, neurological and musculoskeletal fields and in all health care settings, practice of physiotherapists (acute care, rehabilitation, community care, etc.).
- Prepare students to practice professionally, ethically and collaboratively by demonstrating an effective clinical reasoning capacity that includes the use of evidence in a client-centered and evolving practice.

The mission and objectives of the program are consistent with those of the School of Rehabilitation Sciences, the University of Ottawa and the profession, as demonstrated in the following sections and diagram (Figure 1).
Figure 1. Articulated Mission Process of the Physiotherapy Program

- Mission de l'Université
  - Formation de leaders bilingues
  - Culture de service et d'engagement
  - Excellence en matière d'apprentissage
  - Partenariats communautaires
  - Valeurs communes : la collaboration, le sens critique, l'engagement, l'excellence en matière d'apprentissage et de services aux francophones

- Mission de l'École des sciences de la réadaptation
  - Former des professionnels de qualité supérieure
  - Être un chef de file en recherche
  - Répondre aux besoins des communautés francophones en situation minoritaire

- Valeurs de l'ACP
  - Intégration des données probantes, du raisonnement clinique et des compétences thérapeutiques
  - Description de la physiothérapie : approche centrée sur le patient, autonomie, principes éthiques, leadership, jugement critique

- Mission et objectifs globaux du Programme de physiothérapie
  - Former des physiothérapeutes :
    - Bilingues
    - Capables de promouvoir l'excellence
    - Démontrant les compétences essentielles : savoir, savoir-faire et savoir-être
    - Démontrant une pratique professionnelle, éthique et collaborative
    - Démontrant une capacité de raisonnement clinique efficace qui inclut l'utilisation de données probantes dans le contexte d'une pratique centrée sur le client
The curriculum

The new curriculum is articulated based on program values as well as the educational foundation, the foundation for clinical practice and pedagogical principles as illustrated by the diagram below (Figure 2). The values and foundations of the program have been formally updated following the latest PEAC report. In addition, the diagram demonstrates that the program curriculum that is based on the Physiotherapy Entry-to-Practice Curriculum is interrelated with the Integrated Curriculum Plan of the Physiotherapy Program.
Figure 2. Schematization of the integrated curriculum plan
A. Curricular values of the program

The values that underpin our teaching strategies and student learning are derived from the Essential Competency Profile for Physiotherapists in Canada (2009) and are aligned with the overall objectives and training of the program, its foundations and teaching principles. These values guide the decisions and actions of staff within the program.

- **Respect**: This value is put in the foreground in the interactions between professors and students. It is also the cornerstone of the therapeutic relationship as described in the College of Physiotherapists of Ontario's Therapeutic Relationships and Occupational Limitations Guide (2013). Students learn to show consideration, be courteous and listen to others.

- **Collaboration**: Collaboration is advocated within the faculty and among students to improve teaching and maximize learning. Pedagogical strategies bring to the forefront this value, which makes students aware of the benefits of collaborative work and prepares them to work as future professionals within an intra-professional or inter-professional team and in a care partnership and services with clients, their loved ones and the community. We encourage them to act in a spirit of mutual support, sharing and cohesion. We promote the contribution of every person by encouraging their involvement and mobilization.

- **Autonomy**: The student, throughout his academic career, is invited to think and find problem-solving strategies. Professors will use students’ previous knowledge and experience and recognize their autonomy and self-learning ability. At the end of the two years of the master’s degree, the physiotherapy student must be able to demonstrate autonomy in his practice. This value is also encouraged as a professional advocating for client autonomy as cited in the Essential Skills Profile for Physiotherapists of Canada (2009).

- **Integrity**: The student will learn to demonstrate ethical integrity by taking into account the concepts of confidentiality, respect for difference and ethical rules. He learns to be rigorous, to be honest and fair and to act in the best interest of clients, colleagues and the profession, to provide probing, efficient and effective care and services, thereby limiting the financial burden on society and on the customer. As such, professors act as role models for students. For example, they inform students of specific requirements regarding prior knowledge, skills, behavior, and expected attitudes in their courses.

- **Commitment**: The student is an active learner who is involved in learning, improving the program and in their community. The educational strategies of the program encourage the realization of this value. He develops a sense of belonging.
to the program and his profession. His commitment is translated into concrete actions (participation in committees, research projects, etc.).

B. Theoretical foundations of the curriculum
The educational foundations and foundations for clinical practice form the theoretical basis of the program. They served to identify the 7 pedagogical principles of the curriculum that guide curriculum development and learning outcomes.

I. Educational foundations
The educational foundations are intended to guide the teacher in his pedagogical and evaluative methods (Figure 2). Here are the ones selected as the basis for the program:

*Figure 2. Schematization of the integrated curriculum plan*

Theory of adult learning (andragogy)
The principles of adult education proposed by Knowles (1970) guide teachers in choosing the best teaching and evaluation methods to allow students to better retain learning by providing them with guidelines (Henschke, 2011). These principles are also linked to the values of the program mentioned above, because they stimulate student participation as active learners, promote a healthy relationship between professors and the adult learner
by promoting listening needs of the student and promote respect by taking into account the knowledge of the learner (Boufettal, Hermas, Mouatacim, Noun et Samouh, 2009; Health Nexus Santé, 2003; Wautier et Vileyn, 2004).

Here are the principles and their application in the curriculum:

- **Learning is centered on the needs of the learner:** Within the program, students are made aware of their needs through various summative evaluations at the beginning of the course. They are also expected to set their personal learning goals based on their prior knowledge to stimulate internal motivation. For example, in anatomy, students have indicated in the past that they want to learn French terminology while others want to improve their knowledge already acquired in their bachelor's degree.

- **Learning is participatory:** Within the program, educational activities try to give an active role to the learner and to decisions in order to optimize learning. Many courses require students to reflect, encourage group discussions, and advocate the use of interactive tools (ex: clickers). A theoretical course can take a more active format with strategies listed previously. This principle links with the values of the program, our mission to train self-employed and self-taught professionals and the constructivist current, because it encourages the student to ask questions, to articulate his thoughts, to find solutions and to participate in the development of his skills.

- **Learning is based on lived experiences:** Over the years, the learner has accumulated an experiential baggage which tints new learning which constitutes a wealth. Within the program, professors try to take into account this principle by making links with the experiences of trainees, their work experience or their academic background (baccalaureate) to value who they are and what they have learned. This principle is consistent with the value of adherence to our program because the learner’s skills are recognized and used to foster optimal learning.

- **Learning is accompanied by reflection:** The learner appreciates having time and moments of reflection to find the answers by himself. Using various approaches and tools (videoscopy, self-assessment, portfolio, APP), professors encourage students to reflect on their learning, their actions and to make metacognition. The teacher acts as a guide and encourages exchanges between students on the acquired knowledge (the three skills).

- **Learning is based on respect of the student:** Bi-directional learning is encouraged either between the students or with the professor through the many discussions or exchanges. Within the program, this principle is also manifested by openness to different ways of conceiving theory and through listening. They interact with the student by treating him as an equal who will soon become a co-worker. Professors
show respect for the knowledge and experience of students. This principle is anchored well with the values that guide the program.

- **Learning takes place in an atmosphere of trust:** The environment allows the student to learn in a healthy environment in which mistakes are normal and are part of the learning process. Within the program, professors are receptive and enjoyable and the curriculum committee gives students an opportunity to express their views on the operation of the program, the content and teaching of courses. Formative evaluations that reduce stress and allow learning are regularly used in courses.

**Educational approaches**

Several educational approaches guide the choice of different teaching methods used by the physiotherapy program professors. The values of collaboration, autonomy of the program and its overall objectives made it possible to identify three approaches that we want to privilege more and more within the program: the cognitivist approach, the constructivist approach and the socio-constructivist approach that are all from the Cognitivist School. These approaches as well as the behaviourist approach influence course objectives, their content and evaluative methods. In short, the professor acts as a transmitter of information in some basic courses or for the learning of clinical skills (behaviourist), but it also aims to facilitate the treatment and integration of information and to develop the cognitive and metacognitive skills of the learner (cognitivism). The student is engaged and his previous experiences are a base on which learning is built. Discussions with classmates contribute in enriching the learning (constructivism and socio-constructivism) (Legendre, 2004; Tardif, 2006; Vienneau, 2011).

Here is a description of the approaches and their application in the curriculum:

- **Behaviorism:** The influence of this current in education is considerable. One only has to think about defining learning objectives in terms of observable and measurable behaviors. Behaviors are described according to the domains of knowledge, that is, knowledge, know-how, that is, skills and attitudes, that is, attitudes. According to this approach, the accountability of learning is attributable to the environment. The role of the learner is passive. He reacts to his environment (Vienneau, 2017). Its motivation for learning is due to external factors. The professor occupies a central role. He must transmit information and organize the environment in order to modify the behavior of the student according to the learning objectives. He puts in place various reinforcement contingencies (ex: positive verbal reinforcement). Lecture, laboratory demonstrations, and objective assessment methods such as multiple-choice questions are preferred strategies in a behaviourist approach.

- **Cognitivism:** The cognitivist current aims to develop cognitive (information processing) and metacognitive (re-evaluation of information processing) activities.
The learner is therefore an active information processing center. The teacher acts as a facilitator and uses schema building and recall of previous knowledge to stimulate learning (ex: links to learning in other courses and internships ...). It promotes the transfer of knowledge through their use in different contexts. The answer to the questions is less important than the cognitive approach to the answer. The professor provides time for reflection and facilitates the coding and organization of information that promotes clinical reasoning (ex: draws attention to keywords, repeats the most relevant information, asks questions, writes in a box, groups by categories...). To develop metacognition, he leads students to verbalize their cognitive strategies (Legendre, 2004; Tardif, 2006; Vienneau, 2011). This current is related to andragogy principles and program values (commitment, autonomy). The following pedagogical methods used in the program courses can be part of this approach depending on what the learner is asking for: concept maps, small group discussions, simulation labs, clinical visits ...).

- **Constructivism and socio-constructivist**: The constructivist and socio-constructivist are two currents used equally that flow from the cognitivist. In both these currents, learning is an activity of co-construction of knowledge in an individual or social context and it is a function of the knowledge and experiences of the learner. The learner is engaged because of his intrinsic motivation and he is at the helm of his learning. He engages socially (cognitive, emotional and social plan). The teacher is a guide or mediator who helps the learners rebuild their knowledge and give them a new meaning in collaborative activities. To achieve this, the professor favors group activities and critical reflection (high-level cognitive skills) that promote clinical reasoning while offering support. These approaches are related to the principles of andragogy, the values of the program (commitment, collaboration). The following pedagogical methods used in the courses of the program may fit into these approaches depending on what the professor is asking for: courses in APP, discussions in groups, case resolution in dyad, team work, research projects (Legendre, 2004; Tardif, 2006; Vienneau, 2011).

**Bloom Taxonomy / Scaffolding**

This taxonomy presents the learning objectives in the form of a continuum from objectives that focus on simpler cognitive skills (ex: knowledge and comprehension) to more complex cognitive skills and competencies (ex: synthesis and evaluation) (Guité, 2007). The educational currents mentioned above use advanced cognitive skills in that they aim, among other things, for the learner to be able to learn how to process, synthesize and reorganize information. In the curriculum, the course sequence begins with basic theoretical courses that require a lower level of cognitive skills. Nevertheless, teachers try to progress in the cognitive continuum in the same basic course by quickly forcing the learner to make links between different courses or between the concepts seen in the same course.
Here is a table illustrating Bloom's taxonomy and its evolution over time (Figure 3).

**Figure 3. Levels of Thinking in Bloom’s Taxonomy and Webb’s Depth of Knowledge**

<table>
<thead>
<tr>
<th>Bloom’s Taxonomy</th>
<th>Revised Bloom’s Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Remembering</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Understanding</td>
</tr>
<tr>
<td>Application</td>
<td>Applying</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analyzing</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Evaluating</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Creating (previous Synthesis)</td>
</tr>
<tr>
<td>Judge value of material for a given purpose.</td>
<td>Put elements together to form a coherent or functional whole; recognizing elements into a new pattern or structure through generating, planning, or producing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Webb’s Depth of Knowledge &amp; Corresponding Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall and Reproduction (Correlates to Bloom’s Lowest Level)</td>
</tr>
<tr>
<td>Webb’s DOK (2002)</td>
</tr>
</tbody>
</table>

- **Skill/Concept**
  - Engages mental processes beyond habitual response using information or conceptual knowledge. Requires two or more steps.
  - Requires reasoning, developing plan or a sequence of steps, some complexity, more than one possible answer, higher level of thinking than previous 2 levels.
  - Requires investigation, complex reasoning, planning, developing, and thinking probably over an extended period of time. "Longer time periods are not an applicable factor if work is simply repetitive and/or does not require higher-order thinking.

**Learning styles**
The Cognitivist School supports the fact that students all learn differently (Vienneau, 2011). Four learning styles are described in the literature: theoretic, active, reflective, pragmatic. They identify ways of acting, preferences for learning, information processing processes, and personality traits (Murray, 2011). Learning styles allows students to better manage their learning and provides clinical supervisors and professors with a tool to individualize their teaching (Alghasham, 2012; Robertson, Smellie, Wilson et Cox, 2011; Chevrier, Fortin, Leblanc et Théberge, 2000; Murray, 2011; Théberge, Chevrier, Fortin et Leblanc, 2000). It also facilitates dialogue between learners and teachers and can lead to greater respect for differences (important value of the program and andragogic principle). At the beginning of the program, each student will have to answer a validated questionnaire (LSQ) allowing him to know his learning style, and a cohort profile will be generated and shared with the professors to allow some adjustments in terms of learning activities, if desired.
The 4 learning styles are: active, reflective, theoretic and pragmatic.

- **The active** prefer to learn in action. He favors group work. Working alone as seated on the computer does not suit him. It generates a lot of ideas without worrying too much about their realism. He does not like receiving too precise instructions leaving him little room for maneuver.

- **The reflective** likes to have time to think about different perspectives before making decisions. The thoughtful student likes to observe first before acting. He likes to watch videos or movies and get feedback on his work or what he says. He has an ability to produce summary reports and rigorous analysis. He easily organizes his ideas and the information.

- **The theoretic** values the objectivity and expertise of professors and experts. He likes to explore different methods, interrelations and/or abstract concepts. It is the student who wants to know the scientific principles underlying the interventions. He is interested in the latest research and various new ideas, without there being any immediate application.

- **The pragmatic** likes to see concrete results. He has strong planning and problem solving skills. He likes to practice and receive feedback from an expert and make an immediate application of the theoretical notions. It promotes the development of short-term projects with clear performance measures. The student of this style likes written and detailed instructions. (Tremblay et Paradis, 2001, p. 4).

**Life-long learning**

The concept of lifelong learning is a feature of adult learning adopted by UNESCO in 1972. It promotes accessibility to education and an individual's commitment to learning. It systematically leads to the acquisition, renewal, upgrading and completion of the knowledge, skills and attitudes necessary to meet professional requirements (Henschke, 2011). This pedagogical principle is consistent with several values of the program that advocate **autonomy** and **commitment**. It is also linked to several program training objectives, in particular **objectives** 6 and 7.

**Education throughout life:**

- Must be present throughout the life of the individual
- Aims for the acquisition, renewal, updating of knowledge, skills and attitudes that are necessary to meet the demands of a world in perpetual change
- Stimulates motivation for individuals to engage in self-directed learning activities (self-directed learning)
- Occurs in a variety of contexts, and places in varying forms: formal, non-formal and informal.
II. Foundations for clinical practice
The models selected for clinical practice, as well as the pedagogical foundations are intended to guide the teacher on the pedagogical methods to be recommended, but more particularly they aim to standardize the language and provide structures and frameworks to support and develop an optimal clinical practice (Figure 2).
Here are the ones selected to serve as a basis for the program:

The enhanced hypothetico-deductive model
Different models exist to develop the clinical reasoning of the students. The biopsychosocial model fits well into the client-centered approach to care and the principles of the Cognitivist School favored by the physiotherapy program (Figure 4). This enhanced hypothetico-deductive model takes into account all elements of clinical reasoning and includes the data collected by the health professional and highlights the importance of including the client [F. Tremblay] and the biological, psychological and socio-cultural aspects of the clinical decision-making process (Higgs, 2008). The pattern recognition model will be used for simple cases (Figure 5). Several learning strategies related to these models improve clinical reasoning and have been used by the program to target specific educational tools.
The section in green represents the hypothetico-deductive model, the purple section adds the notion of taking into account the patient's opinion at each stage of the clinical decision and the whole represents the psycho-bio-social model.

*(National Training Consortium - University of Ottawa Component, 2015)*

*(Consortium national de formation – Volet Université d'Ottawa, 2015)*
The clinician makes direct links with representations stored in his memory (images, cases). This involves rankings. The professional makes no proposal of hypotheses, he arrives at a solution, a single diagnosis.

The Care Partnership Model – Evolution of the Client-Centered Approach
In the same vein as the previous model, learners and professionals who plan and provide care and services must value the contribution and participation of the person, their family and the community. The client-centered approach to placing the client at the center of the care team is best described by the care partnership model that makes the client's role explicit by describing it as a health care team partner in the care team, which he is involved in his experiential knowledge and that of his family. It is also recognized that the patient has the power over his care (Pan-Canadian Consortium for Interprofessionalism in Health [CPIS], 2010). The partnership model implies that the professional has developed the key skills to work effectively in this direction (Figure 6 and 7). It is therefore prioritized in our teaching for the clinical approach because it adheres to the value of collaboration of the program and objective 3 of the program.

**Figure 6. Evolution of care approaches**

![Figure 6](image)

(University of Montreal, 2014, p.9)

**Figure 7. Key Competencies of the Care and Service Partnership**

![Figure 7](image)
The International Classification of Functioning and Disability (ICF) Model of the World Health Organization

The ICF is a health classification that serves as a conceptual framework and presents a terminology and classification of the consequences of pathologies. It describes the organic functions, anatomical structures, and environmental factors that can affect client activities and participation (Canadian Institute for Health Information, 2017). This model is complementary to that of Shumway-Cooket Woollacott (2012) which is also predominant in the program and which specifies that the motor control in the individual results from an interaction between multiple systems and the outside world and according to tasks to accomplish. In this sense, both the evaluation planning and the intervention planning must be oriented to the task concept in terms of the activities to be performed. The International Classification of Functioning and Disability (ICID) is therefore the model advocated in all courses in order to standardize the clinical language and promote the overall approach of the client (Figure 8). Students learn to make connections between these different elements of the model in order to have an integrated vision of the problematic of the client (current cognitivist). This model is also linked to objectives 1 and 6 of the program.
Evidence-based practice - Evidence-based approach
Evidence-based practice in the form of a model that includes evidence, therapist experience, and client expectations is prioritized in all courses. Students must develop their ability to research scientific evidence, analyze it critically, solve problems while integrating information into their clinical reasoning. These skills are essential to develop for an effective care approach. The model is consistent again with the Cognitivist School as well as with the values of respect of the client and the objectives 1 and 6 of the program. In each class, students are expected to use this model (Figure 9).
The introductory model of interprofessional competencies

This model is linked to the CPIS National Competency Framework for Interprofessionalism (2010). It aims to describe the evolution in the development of skills required by students to be able to work in an interprofessional team or in an intraprofessional context. It advocates the development of communication skills, conflict management, teamwork, and collaboration that are essential for future professionals working in a care team. These skills are also related to the notion of professionalism which also includes professional responsibility and ethical sense (Figure 11 and 12).

The development of these skills is put forward in the values of collaboration and integrity as well as in objectives 2 and 3 of the program. The curriculum repository document can also be viewed to see the application in class.
Figure 11. Pre-registration interprofessional education model in Ontario and timing of skills introduction

(UBC, 2009)
Figure 12. National reference framework of competences in interprofessionalism

La figure 1 illustre l’agencement des domaines et met en évidence trois éléments contextuels qui influencent la manière dont le référentiel de compétences peut être appliqué dans différentes situations. Les domaines de compétences et les éléments contextuels sont décrits ci-dessous.

Figure 1. Référentiel national de compétences en matière d’interprofessionnalisme.

But: collaboration interprofessionnelle

Amélioration de la qualité

Apprenants et professionnels composent leur propre rôle et celui des autres professionnels et mettent ce savoir à profit pour définir et atteindre les objectifs de la personne, de ses proches et de la communauté.

Travail d’équipe

Pour une collaboration interprofessionnelle efficace, les apprenants et les professionnels comprennent les principes régissant la dynamique d’une équipe de travail et les processus de groupe.

Complexité

Apprenants et professionnels s’engagent activement dans la gestion efficace des conflits interprofessionnels et à y faire participer les personnes et leurs proches.

Leadership collaboratif

Apprenants et professionnels collaborent avec tous les participants, y compris les personnes et leurs proches, à la formulation, la mise en œuvre et l’évaluation des soins et des services visant à améliorer la santé.

(RPIS, 2010, p. 11)
C. Teaching principals of the curriculum

The pedagogical principles provide a synthesis of the educational foundations and foundations for clinical practice. They were retained by the faculty to determine more succinctly how to achieve the program's training objectives (Figure 2).

Figure 2. Schematization of the integrated curriculum plan

The teacher/placement supervisor must:

1. Solicit the active participation of the student.
2. Promote the development of clinical reasoning by solving more and more complex problems during the curriculum and/or within targeted courses.
3. Respect learning styles, needs and take into account students' previous experiences and knowledge.
4. Use approaches that value autonomy and the desire for the student to direct his own learning according to his needs (self-determination).
5. Advocate for the use of models of care and evidence among students.
6. Provide opportunities for students to reflect on their practice and to discuss so that they develop new perspectives and a critical sense.
7. Act as a mentor to students in terms of professionalism, collaborator and change agent.

(Adapted from Kaufman, 2003)
D. Means to achieve the program's training objectives
Having established pedagogical principles to guide our approaches, we have retained the following means to achieve the program objectives (Figure 2).

Figure 2. Schematization of the integrated curriculum plan

I. Use of multiple teaching methods
The teaching methods used by professors are numerous and are based on pedagogical principles. To respect the notion of learning style, the teaching strategies used are varied in order to encourage and develop each style in the students. In order to respect the principles of adult education, learning strategies promoting student engagement are put forward (such as problem-based learning, clinical simulations with standardized clients or model clients, self-learning). More traditional strategies (lecture, supervised clinical laboratory, seminars, discussions) are also used in basic courses, but aim at developing clinical reasoning by using increasingly complex cognitive skills.

Professors also use many clinical case histories as they promote learning in a more clinical context and allow for the integration of ethical, communicative, educational, and the acquisition of assessment and intervention skills that are subsequently consolidated into
II. Sequential learning and interaction
The Conceptual Framework of the Physiotherapy Entry-to-Practice Curriculum: Guidelines for Canadian University Programs (2009) was adopted to guide the program in the choice of course parameters while following the program's pedagogical principles (Figure 13).

It has four dimensions schematized in spherical layers that become larger and larger to express the interaction between dimensions and evolution in learning.

*Figure 13. Conceptual Framework for the Physiotherapy Curriculum*

The four dimensions are the **Foundations** (blue - the deepest layer), the **Clinical practice** (green - second layer), the **Professional interactions** (orange - third layer) and **Practice Context** (red - outermost layer). They are then divided into areas of knowledge, skills, and behaviors that provide direction for the content of each course.

A sequential approach was therefore used to develop the curriculum to respect the process of developing cognitive skills from the simplest to the most complex and to promote learning. Thus, the basic theoretical concepts are introduced to then create links and offer more complex situations to students by following Bloom's taxonomy. This approach is presented in the 3 blocks representing the main fields of practice (ortho (6 courses), neuro (2 courses), cardio-respiratory (2 courses)). For example, the CIF model is introduced in the first clinical practice course and is then used and applied in each of the clinical courses using exercises and case studies. Another example demonstrating the sequential approach is observable in the anatomy course. The following example...
illustrates in more detail the teaching sequence of the four dimensions of the entrance course to the practice of physiotherapy.

Anatomy (basics) is first taught, then arthrocinematics and biomechanics follow in the first session (Movement Science - Internal Part of the Clinical Practice Dimension of Physiotherapy). Next, students learn to feel the anatomical landmarks, assess mobility and muscle strength before prescribing appropriate therapeutic exercises (physiotherapy treatment - the middle part of the circle of clinical practice). The next session, they study pathological conditions, assessment and treatments in physiotherapy, which completes the "Clinical Practice of Physiotherapy" dimension in the musculoskeletal field. Simultaneously, they learn clinical decision-making, client-physiotherapist communication and interactions, client-centered practice through case studies and simulations, and the use of evidence-based practice. The internship then makes it possible to apply the bases of the ethical practice learned from the first session. They use the ICF model to document and plan the intervention (Dimension-Professional Interactions in Physiotherapy). Finally, at the end of the curriculum, the last dimension (practice context) is addressed in a more specific way, while the models of health care, the management of practice and services are seen and integrated with the study of complex multi-system cases.
The Training Objectives of the Physiotherapy Program of the University of Ottawa

A. Statement of general qualifications expected of graduates of the program

The expected general qualities were described in the form of training objectives. These training objectives are based on the profession's expectations regarding the different roles that physiotherapists must perform at the beginning and throughout their career. They are also consistent with the overall mission and objectives of the program (Figure 2).

*Figure 2. Schematization of the integrated curriculum plan*

The training objectives are designed to train qualified physiotherapists in the practice of evidence-based practice in the management of rehabilitation of children, adults and elderly clients in the cardiorespiratory, neurological and musculoskeletal fields. They tie in with academic credentials, Canada's Essential Skills Profile and accreditation standards.
At the end of their training, our physiotherapy graduates are expected to:

1- Have the know-how and all the skills required to play a leading role in promoting, improving and maintaining mobility, health and well-being of clients (expert competence);
2- Communicate effectively to establish professional relationships with clients, their families, members of a health care team, and other relevant individuals (communication skills);
3- Work collaboratively to achieve quality client-centered care (collaborative competence);
4- Effectively manage their time, resources and priorities in the practice of physiotherapy (management skills);
5- Use their knowledge and know-how, in a collaborative context, to promote the health and well-being of clients (competence in health promotion);
6- Provide optimal care to their clients through research, creation, application, dissemination and translation of knowledge into the practice of physiotherapy (scholarly competence);
7- Practice in accordance with professional ethics, support the profession and demonstrate high personal behavioral standards (proficiency of professionalism);
8- Ensure optimal care for their clients through the research, creation, application, diffusion and transposition of knowledge in the practice of physiotherapy (competence of scholarly practitioner); Practice ethically, support the profession, and demonstrate high personal standards of behavior (professionalism);
9- Able to provide quality health services in French to francophone minority communities in Ontario and elsewhere in Canada.

The achievement of these objectives will ensure that our graduates have the necessary basis to fully assume their role as an essential stakeholder in Canada's health care system. The achievement of these training objectives by students will be assessed throughout the program and at different times during the course of the programme (courses and internships).
The detailed curriculum of the physiotherapy program

A. Curriculum

In the fall of 2016, the new curriculum of the physiotherapy program was approved by the Faculty of Health Sciences and its implementation was planned for September 2017. However, given the implementation of a new system Student Records Management, all program revisions have been postponed until September 2018.

The curriculum was developed in blocks of knowledge followed by clinical placements related to the content of the previous blocks. Thus, during the first session of the curriculum, students see the basics of the profession in a professional practice course that includes cross-curricular competencies such as ethics and professional conduct, regulation, intra and inter-professional collaboration, clinical reasoning, CIF, the client-centered approach, the introduction to factual practice, the basics of communication, helping relationship and anamnesis, etc. These concepts are then integrated into all other courses of the curriculum.

- The content of the first two sessions is devoted to the field of musculoskeletal practice and begins with the basic knowledge of anatomy and clinical biomechanics which are then integrated into the learning of the basic assessment and intervention techniques of the musculoskeletal practice. A first 6-day observation course in different environments will familiarize students with the different fields of practice. During the 2nd session, the musculoskeletal fundamentals (Pain and inflammatory processes, pathological conditions, etc.), then the more specific evaluation, diagnosis and interventions are discussed. A 6 weeks clinical internship at the beginning of the 3rd session in the musculoskeletal field allows to integrate these different knowledge.

- The third session is devoted to the field of cardiorespiratory practice with the foundations, then the evaluation, the diagnosis and the inventions specific to this field of practice.

- The 4th session is mainly devoted to the neurological field of practice according to the same model (foundations, evaluation, diagnosis and interventions). During this session, a course on factual practice leads students to consolidate one of the pillars of our foundation for clinical practice. They also undertake the first steps of the research project that they must carry out during the second year of the program.

- The 5th session is devoted entirely to 3 clinical internships to put into practice the knowledge acquired in the cardio-respiratory, neurological or musculoskeletal fields of practice, in different clinical settings.
• The 6th session is devoted to specialized tools in physiotherapy, interventions in complex cases involving people with multiple disorders, and the study of health promotion, practice management and other professional issues. In addition, the research project must be finalized and presented to the community. A final 7 week clinical course completes the training.

Here is the outline of the proposed curriculum for each year of the master (Figure 14 and 15).

*Figure 14. Master of Health Sciences Physiotherapy - Year 1*
The content and learning outcomes for each course as well as the methods of teaching and evaluating the learning that ensue were then developed in the curriculum repository of the program last year.
B. Description of multiple teaching methods and active learning

The teaching methods used by professors are numerous and are based on pedagogical principles. They are varied in order to promote and develop each style in students. To respect the principles of adult education, pedagogical methods promoting student engagement are put forward (such as problem-based learning, clinical simulations with standardized clients or model clients, self-learning). More traditional methods (lectures, supervised clinical laboratory, seminars, discussions) are also used in basic courses, but aim at developing clinical reasoning by using increasingly complex cognitive skills.

Professors also use of many clinical case histories as they promote learning in a more clinical context and allow the integration of ethical, communication, and educational elements, as well as the acquisition of assessment and intervention skills.

Here are the main teaching methods:

I. Use of reference books, educational videos, online resources

a. Reference books:
   • The reference books used for the courses should:
     ▪ If possible, appear on the list of recommended books for the study of the National Physiotherapy Competency Examination
     ▪ Serve in more than one course

b. Educational videos:
   • The videos are available either on a DVD or on the learning management system. Students are encouraged to view them to facilitate their learning in the classroom and at internships.
   • Examples: surface anatomy, musculoskeletal assessment, Chedoke-McMaster (neuro).

c. Online Resources

II. Teaching

a. A valuable tool in the teaching repertoire, as long as it is not used in situations where other methods would be more effective.

b. Can be chosen for material where there are no resources such as books or online resources or for teaching more complex material for which the professor facilitates learning.

c. To make this type of teaching more active, the professor would be better off combining it with large-group discussions.
III. **Self-learning**

a. List of readings with or without a reading guide and questions to complete.

b. Time in the schedule is reserved for this self-learning.

IV. **Online learning**

a. Readings, exercises, case studies are available on the learning management platform, then a quiz can be completed to evaluate the learning. Discussion forums can be included to promote exchanges between the student and the professor.

b. Some courses are given entirely online or in hybrid format.

V. **Large group discussion**

a. Following the introduction of a topic through a lecture or a case study, students are invited to discuss. They build their knowledge collectively and this makes it possible to integrate prior knowledge.

b. Each learner must have the opportunity to formulate and share their questions and ideas in small groups and then within the entire class.

c. Professors can stimulate the exchange of ideas by asking questions, giving clues, and encouraging non-judgmental questions and comments from students.

d. This type of teaching can be paired/alternated with lecture in a single session to encourage more active learning of more complex material.

VI. **Small group discussion - case study**

a. A student-centered learning method that can be done individually or in groups.

b. Typically, the learning materials used in a case study can come from a variety of sources, such as a problem-solving and decision-making scenario, an open discussion, an image, or even a schema.

c. Aims to help students describe theoretical concepts in real life questions, as well as help them develop different skills, including clinical reasoning, decision-making and practical skills.
d. Students must propose solutions and arguments.

e. The case study bridges the gap between theory and practice.

VII. **Small group discussion - problem-based learning**

a. Uses stories and scenarios designed as tools for analysis and discussion.

b. Often based on facts and should contain enough detail to require research and stimulate analysis from multiple viewpoints or perspectives.

c. Engages the student in problem solving and active engagement in the material to uncover the underlying issues, dilemmas and conflicts.

d. Requires students to develop analytical thinking skills and reflection skills through the reading and discussion of complex and real-life scenarios.

e. Students identify topics they need to explore, research, and report the information they need to share with team members to resolve the case. The teacher is a facilitator.

VIII. **Group projects with or without presentations**

a. In co-operative learning scenarios, students work together to maximize individual and group learning.

b. It is important to design works that meet specific learning outcomes, and to give students clear instructions concerning the evaluation of the work.

c. Student presentations are also a valuable instructional strategy. Often, students explain concepts in a much simpler way, which can make it easier for their peers to understand. The diversity of presentations (students) and the types of presentations can also be of interest to students.

d. Strengthens critical thinking, evidence-seeking skills, teamwork and communication.

IX. **Clinical skills labs**

Clinical skills laboratories are essential for the acquisition of the know-how and the skills necessary for the profession of physiotherapist. These labs can take various formats.
a. Led by the professor:
   - The professor demonstrates and teaches different clinical skills, for example, assessment tests, peripheral and vertebral mobilizations, neurological rehabilitation, etc.
   - Can also be used to teach the use of effective communication strategies to collect and share data with the client and to share relevant information with the client and family as well as with team members.
   - Students practice with each other and receive feedback from colleagues and professors.

b. Laboratories with standardized patients or models:
   - Standardized patients are people who have received specialized training to simulate the signs and symptoms of a patient. The professors create clinical scenarios and a script for the patient.
   - Provide students with the opportunity to practice communication, patient interview, clinical assessment, and clinical intervention skills in different clinical situations such as acute or chronic conditions, different clinical settings (public or private) and different populations (ages, gender, different motor or cognitive skills).
   - Some clinical scenarios may require the use of model patients. These are people suffering from chronic conditions for which it is difficult to simulate (individuals with amputations, spinal cord injuries, post-stroke, Parkinson’s, etc.). They allow students to improve their abilities to handle, evaluate and treat such cases.
   - Laboratories using standardized or model patients benefit from follow-up discussions in small groups or with the whole class.

c. Clinical simulation laboratories:
   - Audio-visual recording allows students to observe their own performance during clinical scenarios.
   - Also allows you to receive feedback from peers or the professor.
   - This equipment could become available to our students in the coming years and could be very useful in clinical courses.
   - Allows students to develop self-assessment skills and opportunities to reflect on their practice.

X. Clinical visits and presentations

a. Since it is impossible for every student to be exposed to all clinical settings, clinical visits to the community, different for each student or group of students, aim to observe the use of equipment not available in the program or to observe particular clients or specialized approaches.
b. Learning is facilitated with a list of questions to allow students to reflect during the visit so that they can respond.

c. After the visit, each group presents their experience to the class.

d. An example of a course for which this approach could be used is PHT5621 Pain, physical agents and therapeutic modalities (ex: hydrotherapy, shock wave therapy, etc.).

XI. Research project

a. The research project can take different forms (systematic review, development of a research proposal, data collection, etc.).

b. Performed under the supervision of a professor.

XII. Internships

a. Enables students to gain workplace experience before entering the workforce. The valuable experience gained during an internship builds student skills and puts them in touch with professionals in the industry.

XIII. Professional portfolio

a. In order to promote commitment and autonomy in the acquisition of the seven essential skills, a portfolio will be completed by the student in which his learning objectives and progress will be documented, for both courses and internships.

b. By using the professional portfolio of the College of Physiotherapists of Ontario as a framework, the portfolio will help the student:
   - To acquire thinking skills
   - Discover his strengths
   - Identify short and long-term learning goals
   - Prioritize learning objectives
   - Identify learning strategies to achieve goals
   - Evaluate the impact of his learning

c. The portfolio will be organized into five sections in which the student will have to ask himself the following questions and document them:
   - Experience:
     - What happened?
     - What were the results?
• Reflection:
  ▪ What did and did not work?
  ▪ Have you achieved the expected results?
• Goal setting
  ▪ Set SMART Learning Goals
• Learning activities
  ▪ How do you plan to learn?
  ▪ How will you know that there was an apprenticeship?
• Evaluation of results and reflection
  ▪ What did you learn?
  ▪ What did you learn you did not expect to learn?
  ▪ What were the implications of your learning?
  ▪ What do you know now that you did not know before?
  ▪ What can you do now that you could not do before?
  ▪ Do you have to learn something else?

The student will hand over his portfolio to the Clinical Coordinator at mid-session and after each placement. An individual discussion between the student and the Coordinator will take place 4 times during the program to facilitate the process of reflection, self-criticism and the recovery plan to put in place if necessary. The elements previously mentioned in "c" will be discussed except the evaluation of results and reflections, this point being discussed at the subsequent meeting. The portfolio will be evaluated at each meeting by the Clinical Coordinator, in "pass/fail" form. Failure will require the student to rework the unsatisfactory portions of his portfolio.

XIV. Tools that can be used in case study discussions to develop clinical reasoning and decision-making

a. Concept maps:
• Allow to graphically represent concepts that revolve around a subject, to specify the relations that unite and hierarchize them.
• Used for:
  ▪ Activate students' previous knowledge.
  ▪ Structure knowledge in the classroom.
  ▪ Check the integration of the concepts covered throughout a course.
  ▪ Validate the understanding of a text, a conference, etc.
• Allow the teacher to analyze and correct the student's clinical reasoning by making it visible.
• Students should illustrate the links between different data to illustrate their reasoning (Higgs, 2008).
• It is possible to integrate the production of concept maps into formative or summative evaluations (Laval University, 2017).
b. SNAPPS tools and "the Supervisor’s minute":
- Tools that allow students to become more independent and more engaged in developing their clinical reasoning.
- They are encouraged to adopt a structured self-questioning strategy that allows them to shape their clinical reasoning through a hypothetico-deductive process (Wolpaw, Papp et Bordage, 2009).
- SNAPPS:
  - S – Synthesize briefly history and data (subjective and objective evaluation) in a presentation lasting less than three minutes. The student must highlight the key/relevant information.
  - N – Name two or three relevant hypotheses related to the problem. The student verbalizes his understanding of the case.
  - A – Analyse the possible solution by comparing or contrasting the data. The student justifies his choice of hypotheses according to the data and his knowledge. Thus, he exposes his thought process.
  - P – Pose questions to the professor. The student initiates the interaction with the professor regarding the gaps he sees (lack of knowledge, confusion with specific data ...).
  - P – Propose an intervention plan. The student specifies the specific interventions.
  - S – Sélect a subject of self-study. The student is responsible for filling in the gaps and mitigating them by various means. The professor can make suggestions to help the student.
- "The Supervisor’s minute:
  - 5 steps (Jouquan, 2010):
    - Invite the student to take a stand (by formulating a hypothesis, proposing an evaluation process, proposing a therapeutic decision, etc.)
    - Ask the student to argue his position (justify how he arrived at this proposal, evidence, etc.)
    - State a general rule (teaching time that confirms the hypothesis that explains the decision and discuss general principles related to the case.)
    - Validate the relevant elements of the student's support (reinforcement of what is good and relevant)
    - Identify errors and suggest alternative solutions
- Integrated SNAPPS and "the Supervisor’s minute" (Figure 16).
"Scaffolding" technique:

- According to Cutrer, Sullivan et Fleming (2013), scaffolding is a key mechanism that professors can use to help students organize their clinical knowledge.
- The teacher helps the learner solve a problem, understand a concept or wait for a goal that would be too difficult without help.
- Using index and questions, students learn to reorganize their knowledge themselves.
- Based on immediate feedback in real time while the learner articulates his understanding of the clinical presentation. This feedback is essential not only for reorganizing knowledge, but for the eventual development of intuitive
reasoning.

- This process works well when discussing in small or large groups using a case study.

e. Match scripts:

- Involves in presenting candidates with a series of clinical problems and asking them to make diagnostic, investigative or treatment decisions when additional clinical information is provided.
- Measures the degree of organization of knowledge, to check if knowledge is developed, that is, organized to act effectively in the clinical context.
- A scoring system is designed to measure the degree of similarity that exists between the candidate's script and those of the experienced professionals of a reference panel, hence the name of match test.
- Such tools could be developed gradually over the next few years and integrated into the courses to foster the development and evaluation of clinical reasoning.

f. Here is an example used in medicine (Figure 17):

_Figure 17. Match scripts_

(Charlin, Gagnon, Sibert, et Vander Vleuten, 2002).
XV. Peer review

a.Peer review, if formative, can be used as a teaching method.

b. It aims to directly involve the student in his learning.

c. This type of assessment allows students to develop a better understanding of the topics presented and develop self-reflection by evaluating the work done by their peers and providing constructive feedback (University of Ottawa, 2016).

XVI. Self-evaluation

a. Self-assessment seems more reliable for aspects that affect professionalism: empathy, ethics, and lack of reliability for technical knowledge (Scallon, 2015).

b. Self-evaluation stimulates learners' reflections on their learning and develops their autonomy.

c. Self-assessment reflects students' ability to understand learning outcomes and success criteria and to use them to judge what has been learned and what remains to be done, and then to establish a learning plan and the strategies of implementation (University of Ottawa, 2016).
Description of evaluation methods
The evaluation methods used can be either formative or summative and depend on the specific objectives of each course. Feedback may be offered to students constructively throughout the training and as a result of the evaluations.

I. Written exam/quiz (multiple choice, short answer)
- Very flexible evaluation format that can measure knowledge, skills, values, thinking skills, etc.
- One to three hours is a way of assessing a student's ability to recall, assimilate and apply the knowledge gained by studying a module or unit of instruction.

II. Practical examination (traditional or ECOS type)
- Allows to evaluate particularly the know-how and the well-being of the students.
- The traditional format implies that students perform the requested interventions (usually chosen at random) from a partner.
- ECOS (Structured Objective Clinical Examination) exams require the use of a simulated patient. This type of examination involves a series of clinical stations lasting 5-10 minutes each to evaluate different skills.

III. Group work
- Teamwork is undertaken collectively by groups of students working collaboratively.
- This strategy has the practical benefit of potentially reducing the teacher's workload related to assessment and the pedagogical benefit of assisting the development of collaborative work skills among students.
- The assessment of this type of work may be one of a group or combined with an individual assessment, observations made by the teacher, self-assessments or assessments made by the students, as they are best placed to judge the contribution of their peers.

IV. Laboratory report
- Aims to document findings and communicate their importance.
- A good laboratory report is not limited to the presentation of data; rather, it demonstrates the student's understanding of the concepts underlying the data. It is not enough to note the expected and observed results; one must also understand how and why these differences have occurred, be able to explain their effect on the experience, and demonstrate an understanding of the principles the experiment was aiming for.

V. Case study
- Can become a means of assessing the student's understanding, analysis and reasoning.
VI. Written work
   • Answers a question as a continuous text.
   • Aims to assess the student's ability to express, evaluate, analyze, summarize and critique.
   • There are two dangers to written work: they are easy to plagiarize and excessive weight is often given to such things as style, writing and grammar.

VII. Oral presentation
   • Can take a number of forms, such as a presentation in front of peers, a thesis defense or a simulation of a real life scenario.
   • Can be done individually or in groups.

VIII. Poster
   • Visualization of autonomous information developed by groups or individuals that is presented to peers and faculty members.
   • An example of an alternative method of evaluation in projects typically leading to traditional productions, including essays.
   • It is essential to provide clear instructions to students about the content that will be assessed and the identity of the evaluator.

IX. Participation
   • Generally assessed based on the student's oral participation in class (their answers to questions, their participation in discussions, etc.).
   • It is important to clearly define the evaluation criteria and to inform the students.

X. Exercises (concept map, etc.)
   • Problems or exercises based on material previously taught, to which the student must provide detailed written answers.
   • Does not require additional research, the goal is to learn and become familiar with the material, and to solve typical problems.

(Adapted from the University of Ottawa, 2016)

XI. Observation grid
   • Must be adapted to its context of use.
   • Develop a list of observable and measurable behaviors that correspond to the degree of behavioral control enunciated by a scale (Scallon, 2000).
   • The steps of a uniform and quantitative scale can be letters (a, b, c), numbers (1, 2, 3, 4), pictograms (☺), graphs (+ + +) or descriptors (below expectations, meets expectations, exceeds expectations, etc.).
   • Graphical scales consist of placing one's judgment on a line. They are more appropriate in a context of self-evaluation.
• Here are some grids that will be used in the program. E.g.: SACCI to assess interprofessional competencies, adapted grid of the Hackman model to evaluate group work.

XII. **Peer review**
• Evaluative approach by which the characteristics of a student's work are judged by their peers.
• The teacher needs to clearly explain their expectations before proceeding and guiding the students by giving them clear criteria for scoring.
• To ensure the proper functioning of peer reviews, a positive learning environment is required. Students need to feel comfortable and trust themselves to be able to provide frank and constructive feedback.
• This evaluation method has been documented as effective by various authors (Linn et Grønlund cited by Scallon, 2015). It makes it possible to evaluate the affective relationships that are present within the group. Goldie (2013) reports that professionalism is the most often peer-reviewed aspect (University of Ottawa, 2016).
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